A Survey of Products Used in Rainwater Catchment Systems:

Products that Contact Water Intended for Human Consumption
and Their Suitability for Such Usage
in the United States Virgin Islands

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Virgin Islands Department of Planning and Natural Resources
Division of Environmental Protection

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St. Thomas, U.S. Virgin Islands 00802-9999
ACKNOWLEDGEMENTS

ST. THOMAS
A and A Quality Construction
Apex Construction - Joe Hodge
AZTee Construction
B and B Manufacturing
Best Construction
Cash and Splash - Elroy Allen
Dawson Construction
Dynamic Construction
East End Lumber - Rupert Foster/ Wingrove Fenton
Elkyn Lloyd Construction
H and M Systems - Richard Washburn
Halvor Francis Construction
Hammer-Cock Construction
HF Construction - Hercules Fraser
Island Block - Frank Stapleton
Jean Draggin Enterprises - Jean Draggin
Joseph Construction
K-Mart Corporation - Clement Warner/ Anthony Sutherland
Mike’s Paint Store - Charles Bonanno
MSI Building Supply - Yanick Bayard
Paint Depot - Mike Perron
Q and A Services
Real Construction
Roses Construction
Sea Chest - Craig Kirchoff
Vernon Quiland Construction
V.I. True Value Hardware - Jami Pfister
Woods Construction

ST. JOHN
Barry Duncan Enterprises - Barry Duncan

ST. CROIX
A to Z Paint Supply
Caribbean Coatings
Paint Locker - James Rosado
Paint N’ Things - Lyle Munson
Roofops - William Foust
St. Croix Trading - James Bell
Superior Block Inc. - Lily Lawaetz
Technical Coatings - Chuck Henry

EDITORIAL PRODUCTION
Edwin Edwards
Shirley Lincoln
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Introduction

Rainwater catchment is the principal source of water for the majority of residences in the United States Virgin Islands. Virgin Islands law mandates that residences be constructed in a manner that provides for the harvesting and storage of rainwater for use in the residences. The most commonly used harvesting installation consists of a catchment surface, a conveyance and a cistern or other storage facility. Direct runoffs from the roofs are conveyed through gutters and downspouts to the cisterns for storage.

A wide range of substances is applied to roof surfaces for aesthetic reasons, to protect the surfaces from rapid deterioration and/or to prevent or to stop leaks. Similarly, cisterns are coated to prevent leaks. These substances are often applied to roofs and cisterns without consideration being given to their suitability for use in water catchment systems intended for harvesting water for human consumption.

Many home owners may not be aware of potential health hazards and may rely on the expertise and goodwill of manufacturers and distributors to provide them with products that are safe and appropriate for use in the catchment systems intended for human consumption. For the purpose of this study these substances (coatings, paints, roof tiles, sealants, gutters, etc) will be referred to as coatings.

Since these coatings are not currently regulated in the United States Virgin Islands, there is genuine concern that there may be threats to human health associated with coatings that come in contact with the water derived from the rainwater catchment systems. For instance, the health hazards associated with asbestos tiles and lead-based paints have been well documented. Studies have also linked exposure to high levels of volatile organic compounds (VOC) in drinking water to adverse health effects including increased risk of cancer.
As a result of the potential health hazard, efforts are now underway to regulate the coatings used in rainwater catchment systems. To that end, the Water Resources Research Institute (WRRI) of the University of the Virgin Islands (UVI) was given the responsibility of conducting a survey of the water catchment system coatings used in the U.S. Virgin Islands to obtain toxicity information from manufacturers. Eventually, a protocol will be developed for rainwater catchment systems. This will be incorporated into NSF (National Sanitation Foundation) Standard 61, which focuses on contaminants and impurities that are directly imparted to drinking water from materials or products in contact with the drinking water.
Objectives of Survey

The purpose of this investigation was to compile information to facilitate establishment of standards to which materials used in rainwater catchment systems (RWCSs) in the U.S. Virgin Islands must conform. Survey staff gathered information from manufacturers, material suppliers, home builders and contractors, and government regulatory agencies. The investigation consisted of:

1) Determining the type of coatings marketed or used in components (roofs, drainage, storage facilities) of rainwater catchment systems in the U.S. Virgin Islands.

2) Determining if these coatings had been previously tested by the manufacturer under any existing regulation or private protocol, and found suitable for use in situations where the water contacted will be consumed by humans.

3) Obtaining available toxicity information and recommended uses from the coating manufacturer.

4) Determining the market distributions of the various coatings used.
The survey conducted by the Water Resources Research Institute was initiated by first determining all possible local distributors who sold products for rainwater catchment systems. This information was obtained from advertisements, telephone books, etc. After potential distributors were identified, a list was compiled with the name of the distributor, a contact person, phone and fax number, address, and similar data. The resulting list is shown in Figure 1.

At that point, the distributors were contacted and informed of the project being undertaken. They were asked to provide answers to a survey. They were offered the option of answering by telephone conversation, or in person at their business site. They further could choose to fill out the form themselves, or provide verbal responses to be written down by WRRI representatives visiting their site by appointment. The survey consisted of information such as the distributor's name, address, telephone/fax, the company's objective (the service performed by the company), and information regarding materials used in cisterns, roofs, downspouts, and gutters. An example of the survey is shown in Figure 2.

Using surveys completed for each of the three islands - St. Thomas, St. John, St. Croix - a list of all products found to be sold in the region was compiled, including all collected information. This list is shown in Tables 1, 2, and 3 in the section entitled Discussion of Findings.

Manufacturers were then contacted by telephone or by facsimile, to collect information on the toxicity potential and recommended uses for the products which are found in material safety data sheets (MSDSs). These sheets contain information on hazardous ingredients, reactivity data, health hazards, and permissible exposure limits. MSDS information provided by manufacturers is shown in Appendix A.
The market distribution of products used in the rainwater catchment systems was determined by interviewing contractors. Using a list of licensed contractors provided by the Department of Licensing and Consumer Affairs, WRRI representatives contacted them by telephone as well as on-site visits. An example of the questionnaire used is shown in Figure 3, and the list of contractors is shown in Figure 4.

After the information was gathered, it was sorted into categories (responses, MSDS information, questionnaires, certification letters, etc.), and responses were compiled and analyzed. This report summarizes the information gained through this survey.
## Figure 1. Distributor List

<table>
<thead>
<tr>
<th>DATE</th>
<th>CONTACT PERSON</th>
<th>COMPANY NAME</th>
<th>ADDRESS</th>
<th>CITY/STATE</th>
<th>ZIP</th>
<th>PHONE</th>
<th>FAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 21, 1996</td>
<td>Mrs. Lily Lawaetz</td>
<td>Superior Block Inc.</td>
<td>P.O. Box 1130, Christiansted,</td>
<td>St. Croix, USVI</td>
<td>00821-1130</td>
<td>778-5772</td>
<td>692-5454</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Jim Dye</td>
<td>V.I. Cement &amp; Building Products</td>
<td>P.O. Box 7368</td>
<td>St. Thomas, USVI</td>
<td>00801</td>
<td>775-2926</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td></td>
<td>R.R. Caribbean &amp; Benton Construction</td>
<td>P.O. Box 300, OrangeGrove, Christiansted.</td>
<td>St. Croix, USVI</td>
<td>00820-4353</td>
<td>777-9644</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Sam Graci</td>
<td>CCI-Gaudet</td>
<td>P.O. Box 1350, Kings Hill,</td>
<td>St. Croix, USVI</td>
<td>00851</td>
<td>772-2442</td>
<td>772-3346</td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Stephen Bishop</td>
<td>Circle Construction</td>
<td>P.O. Box 306498</td>
<td>St. Thomas, USVI</td>
<td>00802</td>
<td>779-7302</td>
<td>774-7277</td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Eimore Charles</td>
<td>Circle Construction</td>
<td>P.O. Box 306498</td>
<td>St. Thomas USVI</td>
<td>00802</td>
<td>774-7277</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Dave Stabbert</td>
<td>Dave Stabbert Master Builder</td>
<td>P.O. Box 6501, Suite 201, Red Hook Plaza</td>
<td>St. Thomas USVI</td>
<td>00802</td>
<td>774-4694</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td></td>
<td>Gateway Development Corp.</td>
<td>P.O. Box 37</td>
<td>St. Thomas, USVI</td>
<td></td>
<td></td>
<td>00802</td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Ms. Jean Draggin</td>
<td>Jean Draggin Enterprise</td>
<td>P.O. Box 6539</td>
<td>St. Thomas, USVI</td>
<td>00802-1338</td>
<td>775-2005</td>
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</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Robert Inda</td>
<td>Pan American Investment Inc.</td>
<td>P.O. Box 24086, Gallows Bay,</td>
<td>St. Croix USVI</td>
<td>00824</td>
<td>772-4771</td>
<td></td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Rex Schuster</td>
<td>Reflex Construction</td>
<td>P.O. Box 8385, Sunny Isle,</td>
<td>St. Croix USVI</td>
<td>00823</td>
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<td>July 21, 1996</td>
<td>Mr. Joe Hollins</td>
<td>Tip Top Construction</td>
<td>P.O. Box 24933, Gallows Bay</td>
<td>St. Croix USVI</td>
<td>00824</td>
<td>773-5252</td>
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<td>July 21, 1996</td>
<td>Mr. Bob Beal</td>
<td>Caribbean Steel Building Inc.</td>
<td>P.O. Box 305730</td>
<td>St. Thomas USVI</td>
<td>00803</td>
<td></td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Jim W. McCurry</td>
<td>The Amaia Company</td>
<td>P.O. Box 302487</td>
<td>St. Thomas, USVI</td>
<td>00803-2487</td>
<td>775-1272</td>
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</tr>
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<td>July 21, 1996</td>
<td>Mr. Glen Lindenmann</td>
<td>Tropical Painters Inc.</td>
<td>P.O. Box 673, Kings Hill.</td>
<td>St. Croix USVI</td>
<td>00851</td>
<td>772-0938</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Ms. Debbie Chopman</td>
<td>A to Z Paint Supply Inc.</td>
<td>P.O. Box 4065, Kings Hill.</td>
<td>St. Croix USVI</td>
<td>00851</td>
<td>773-7075</td>
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<tr>
<td>DATE</td>
<td>CONTACT PERSON</td>
<td>COMPANY NAME</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Barry Duncan</td>
<td>Barry's Paint Store</td>
<td>P.O. Box 426, Cruz Bay,</td>
<td>St. John, USVI</td>
<td>00830</td>
<td>779-4060</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Jose Saldana</td>
<td>Colorama Auto Body</td>
<td>P.O. Box 5992, Sunny Isle,</td>
<td>St. Croix, USVI</td>
<td>00823</td>
<td>778-6290</td>
<td></td>
</tr>
<tr>
<td>July 21, 1996</td>
<td>Mr. Phil Crosier</td>
<td>Gannet Hardware &amp; More</td>
<td>P.O. Box 24188, Christiansted</td>
<td>St. Croix, USVI</td>
<td>00824</td>
<td>773-1034</td>
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<td>July 21, 1996</td>
<td>Mr. Pedro Cruz</td>
<td>Glidden Paints</td>
<td>P.O. Box 5978, Sunny Isle</td>
<td>St. Croix, USVI</td>
<td>00823</td>
<td>773-3124</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Harry Bowman</td>
<td>Pittsburgh Paints - Island Block</td>
<td>P.O. Box 10</td>
<td>St. Thomas, USVI</td>
<td>00804</td>
<td>774-0158</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Chuck Henry</td>
<td>Technical Coatings</td>
<td>P.O. Box 7350</td>
<td>St. Croix, USVI</td>
<td>00823</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. Charles Bonanno</td>
<td>Mike's Paint Store</td>
<td>P.O. Box 8870</td>
<td>St. Thomas, USVI</td>
<td>00801</td>
<td>775-0429</td>
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<tr>
<td>July 21, 1996</td>
<td>Mr. James Rosado</td>
<td>Paint Locker</td>
<td>P.O. Box 157, Christiansted</td>
<td>St. Croix, USVI</td>
<td>00820</td>
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<td>July 21, 1996</td>
<td>Mr. Lyle Munson</td>
<td>Paint N' Things</td>
<td>P.O. Box 24037, Gallows Bay</td>
<td>St. Croix, USVI</td>
<td>00824</td>
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<td>July 21, 1996</td>
<td>Mr. Craig Kirchoff</td>
<td>The Sea Chest</td>
<td>P.O. Box 3806, Crown Bay</td>
<td>St. Thomas, USVI</td>
<td>00802</td>
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<td>July 21, 1996</td>
<td>Mr. Caribbean</td>
<td>Caribbean Coatings</td>
<td>P.O. Box 946</td>
<td>St. Croix, USVI</td>
<td>00821</td>
<td>773-3812</td>
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<td>July 21, 1996</td>
<td>Mr. Mike Perron</td>
<td>Tropical Painters Inc.</td>
<td>Al Cohens Plaza,</td>
<td>St. Thomas, USVI</td>
<td>00802</td>
<td>772-0938</td>
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<td>July 21, 1996</td>
<td>Mr. Bill Foust</td>
<td>Rooftops Basin Triangle</td>
<td>P.O. Box 3025, Estate Friedenstein, Christiansted</td>
<td>St. Croix, USVI</td>
<td>00820-4707</td>
<td>778-8550</td>
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<td>July 21, 1996</td>
<td>Mr. Stephen Schuler</td>
<td>SSS Roofing &amp; Sheetmetal</td>
<td>P.O. Box 9692,</td>
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<td>V.I. True Value Hardware</td>
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<td>Ali Hardware</td>
<td>952 Williams Delight, Frederiksted</td>
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<td>Tutu Mall</td>
<td>St. Thomas, USVI</td>
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<td>776-8800</td>
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<td>Steel Plus Supplies</td>
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<td></td>
<td>Woodworth Wholesale Corp.</td>
<td>119-121 Gallows Bay</td>
<td>St.Croix, USVI</td>
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<td>Discount Building Supplies, Inc.</td>
<td>26 Mars Hill, Frederiksted</td>
<td>St. Croix, USVI</td>
<td></td>
<td>772-4575</td>
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<td></td>
<td>Mr. Richard Washburn</td>
<td>H and M systems</td>
<td>P.O. Box 304601</td>
<td>00803-4601</td>
<td>774-6660</td>
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<td></td>
<td>Mr. Patrick Bayard</td>
<td>B and B Manufacturing Inc.</td>
<td>P.O.Box 4937</td>
<td>00803</td>
<td>775-1500</td>
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</table>
Figure 2. Survey Form

SURVEY OF ROOF CATCHMENT SYSTEMS MATERIALS UTILIZED IN THE U.S.
VIRGIN ISLANDS

Company Name: ________________________________
Contact Person: ________________________________
Address: ______________________________________

Phone: ________________________________
Fax: ________________________________

Company Objective: (Circle the item(s) which most describe your company's service)

A. Cistern Construction
B. Cistern Repair
C. Roof Construction
D. Roof Repair
E. Gutter Construction
F. Gutter Repair
G. Downspout Construction
H. Downspout Repair
I. Material Supplier
J. Material Manufacturer
K. Paint Contractor
L. Blocks/Concrete Manufacturer
M. Blocks/Concrete Supplier
N. Other ________________________________

Please complete the form to provide information regarding materials used in the construction and repair of cisterns, roofs, downspouts, and gutters. Feel free to add additional materials not listed which are related to water catchment. (Product Field of Use: Roof, Cistern, Gutter, &/or Downspout)

GUTTERING
1. Material Name: ________________________________
   Material Type/Description: ________________________________
   Product Field of Use: ________________________________
   Manufacturer Name: ________________________________
   Manufacturer Address: ________________________________
   ________________________________
   Manufacturer Phone No: ________________________________
   Manufacturer Fax No: ________________________________

2. Material Name: ________________________________
   Material Type/Description: ________________________________
   Product Field of Use: ________________________________
   Manufacturer Name: ________________________________
   Manufacturer Address: ________________________________
   ________________________________
Manufacturer Phone No: ___________________
Manufacturer Fax No: ___________________

3. Material Name: _________________________
Material Type/Description: _________________________
Product Field of Use: _________________________
Manufacturer Name: _________________________
Manufacturer Address: _________________________

Manufacturer Phone No: ___________________
Manufacturer Fax No: ___________________

GALVANIZE

4. Material Name: _________________________
Material Type/Description: _________________________
Product Field of Use: _________________________
Manufacturer Name: _________________________
Manufacturer Address: _________________________

Manufacturer Phone No: ___________________
Manufacturer Fax No: ___________________

5. Material Name: _________________________
Material Type/Description: _________________________
Product Field of Use: _________________________
Manufacturer Name: _________________________
Manufacturer Address: _________________________

Manufacturer Phone No: ___________________
Manufacturer Fax No: ___________________

LINER

6. Material Name: _________________________
Material Type/Description: _________________________
Manufacturer Name: _________________________
Manufacturer Address: _________________________

Manufacturer Phone No: ___________________
Manufacturer Fax No: ___________________

7. Material Name: _________________________
Material Type/Description: _________________________
Manufacturer Name: _________________________
Manufacturer Address: _________________________

Manufacturer Phone No: ___________________
ADHESIVE

8. Material Name: ____________________________
   Material Type/Description: ____________________
   Manufacturer Name: __________________________
   Manufacturer Address: __________________________
   __________________________
   Manufacturer Phone No: ________________________
   Manufacturer Fax No: __________________________

9. Material Name: ____________________________
   Material Type/Description: ____________________
   Product Field of Use: __________________________
   Manufacturer Name: __________________________
   Manufacturer Address: __________________________
   __________________________
   Manufacturer Phone No: ________________________
   Manufacturer Fax No: __________________________

SEALANT

10. Material Name: ____________________________
    Material Type/Description: ____________________
    Product Field of Use: __________________________
    Manufacturer Name: __________________________
    Manufacturer Address: __________________________
    __________________________
    Manufacturer Phone No: ________________________
    Manufacturer Fax No: __________________________

11. Material Name: ____________________________
    Material Type/Description: ____________________
    Product Field of Use: __________________________
    Manufacturer Name: __________________________
    Manufacturer Address: __________________________
    __________________________
    Manufacturer Phone No: ________________________
    Manufacturer Fax No: __________________________

COATING

12. Material Name: ____________________________
    Material Type/Description: ____________________
    Product Field of Use: __________________________
    Manufacturer Name: __________________________
    Manufacturer Address: __________________________
    __________________________
    Manufacturer Phone No: ________________________
Manufacturer Fax No: ______________________

13. Material Name: ________________________
Material Type/Description: __________________
Product Field of Use: _____________________
Manufacturer Name: _________________
Manufacturer Address: ____________________

Manufacturer Phone No: __________________
Manufacturer Fax No: ___________________

PAINT

14. Material Name: ________________________
Material Type/Description: __________________
Product Field of Use: _____________________
Manufacturer Name: _________________
Manufacturer Address: ____________________

Manufacturer Phone No: __________________
Manufacturer Fax No: ___________________

15. Material Name: ________________________
Material Type/Description: __________________
Product Field of Use: _____________________
Manufacturer Name: _________________
Manufacturer Address: ____________________

Manufacturer Phone No: __________________
Manufacturer Fax No: ___________________

CONCRETE BLOCKS

16. Material Name: ________________________
Material Type/Description: __________________
Product Field of Use: _____________________
Manufacturer Name: _________________
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Manufacturer Phone No: __________________
Manufacturer Fax No: ___________________

17. Material Name: ________________________
Material Type/Description: __________________
Product Field of Use: _____________________
Manufacturer Name: _________________
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Manufacturer Phone No: __________________
THINNERS

18. Material Name: ____________________________
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   Product Field of Use: ____________________________
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   Product Field of Use: ____________________________
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   Manufacturer Phone No: ____________________________
   Manufacturer Fax No: ____________________________

Your company name along with the services/products which you provide may be included in the Water Resources Research Institute's publication of roof catchment systems materials utilized in the U.S. Virgin Islands. Please sign the appropriate section below. Thank for your cooperation.

____________________ I do not wish to have my company and services listed in a Water Resources Research Institute Publication.

____________________ I wish to have my company and services listed in a Water Resources Research Institute Publication.
Figure 3. Contractors Questionnaire

Name of Company

We are currently conducting a survey which deals with rainwater catchment systems, which entails roofing materials, gutters and downspouts materials, cistern materials.

What type of work does your company specialize in?
(Repairs, Building homes from scratch, other.....)

What type of Roofing materials does your company prefer to use?
Sheeting (galvanize, galvalume, etc.)
Coatings (Top Coat, Tropicoat, etc.)
Other

and is it purchased locally or from away?

What type of Gutter/Downspout materials does your company use and where do you purchase them from?

What type of Cistern materials does your company use, and where do you purchase them from?
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<td>ISLAND CONSTR./CONTRACTING Svc INC</td>
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| **1.** CORMAN CONSTRUCTION INC.  
  P.O. Box 11981 Stt VI 00801  
  38656  15110  05/31  25 S. Park Sttt VI  
  PHONE: 809-775-0725 |
| **2.** MORRISON KNUDSEN CORPORATION  
  P.O. Box 73, Boise, ID 83729  
  70067  15110  05/31  21-25 Kongens Gade Sttt VI  
  PHONE: 208-369-5000 |
| **3.** MORTON, LOFTON  
  P.O. Box 3932 Stt. Thomas VI 00803  
  60187  15110  05/31  401-25 construction  
  HOSPITAL GROUND #37 STT  
  PHONE: 809-771-9183 |
| **4.** MCKENZIE BUILDING SUPPLIES INC  
  P.O. Box 1800 Stt. Thomas VI 00803  
  5127  15110  05/31  modular systems  
  8 crown bay Sttt. Thomas VI  
  PHONE: 809-776-5511 |
| **5.** MCKELVY, FRANCISCO  
  P.O. Box 9096 Sttt. Thomas VI 00801  
  62931  15110  05/31  401-25 construction consultant  
  8 crown bay Sttt. Thomas VI  
  PHONE: 809-776-5511 |
| **6.** NATTA, JOHN JAMES  
  P.O. Box 6122 Sttt. Thomas VI 00801  
  41707  15110  05/31  J M CARRINGTON SERVICES  
  HOSPITAL GROUND #37 STT  
  PHONE: 809-776-1539 |
| **7.** O'NEAL, EDUARDO  
  P.O. Box 10358 Sttt. Thomas VI 00801  
  60109  15110  05/31  eduardo o'neal  
  8 crown bay Sttt. Thomas VI  
  PHONE: 809-776-2951 |
| **8.** OBRIEN PLUMBING CO INC  
  P.O. Box 622037 Sttt. Thomas VI 00805-2037  
  16959  15110  05/31  obrien construction co  
  8 crown bay Sttt. Thomas VI  
  PHONE: 809-776-5511 |
| **9.** OVERSEAS STEEL FABRICATORS, INC.  
  8501 RED HOOK PLAZA Sttt. Thomas VI 00802-  
  85338  15110  05/31  overseas steel fabricators, inc  
  8 crown bay Sttt. Thomas VI  
  PHONE: 809-775-1697 |
| **10.** PALM GARDENS DEVELOPMENT CORP.  
  85338  15110  05/31  palm gardens development corp.  
  parcel 300b est. winberg, st. v. i.  
  PHONE: 809-775-1697 |
| **11.** PARKER CONSTRUCTION INC.  
  88166  15110  06/30  parker construction, inc.  
  8 crown bay st. v. i.  
  PHONE: 809-775-3089 |
| **12.** PAUL, VANT  
  7789 est. st. peter sttt. Thomas VI 00802  
  42115  15110  06/30  vant paul construction  
  2529 est. st. peter sttt. Thomas VI  
  PHONE: 809-774-4827 |
| **13.** PETTY, JOHN DAVID  
  91497  15110  06/30  john david petty  
  8501 RED HOOK PL. STE. 201 STT VI 00802  
  PHONE: 809-777-1104 |
| **14.** PILIER, FRANCISCO J.  
  P.O. Box 306853 Sttt. Thomas VI 00803  
  68048  15110  06/30  francisco j. pilier  
  back street 1 stt VI  
  PHONE: 809-776-5003 |
| **15.** PINNEY, CALVIN  
  est. Thomas VI Apt 2 STT VI 00801  
  24156  15110  06/30  pinney construction  
  est. st. thomas 8th apt 2 st. v. i.  
  PHONE: 809-775-3089 |
| **16.** PINNEY, VANCE EVANS  
  est. st. thomas vi apt 2 sttt. Thomas VI 00801  
  68048  15110  06/30  v. e. pinney builders  
  st. thomas vi  
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<td>09/30</td>
<td>GORDON BUILDERS</td>
<td>P.O. BOX 1501 STT V.I.</td>
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<td>WEST INDIAN CO LTD</td>
<td>1069</td>
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<td>09/30</td>
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<td>WHITE, P WATSON</td>
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<td>09/30</td>
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<td>1655</td>
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<td>WOODCOCK, RONALD L.</td>
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<td>1 ZARCO CONSTRUCTION CO. INC.</td>
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<td>15110</td>
<td>09/30</td>
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<td>999-774-6453</td>
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<tr>
<td>P.O. BOX 6338 STT V.I 00801</td>
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<td>5 &amp; 6 KONGENS GADE STT V.I</td>
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<td>15110</td>
<td>09/30</td>
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Number of CONSTRUCTION CONTRACTOR records found: 775


Discussion of Findings

The rainwater catchment system materials found in the U.S. Virgin Islands are shown in Tables 1, 2 and 3 where each table represents a different section of the catchment system. Table 1 consists of 126 different products used on the catchment surface, the roof. These products are produced by 53 manufacturers and distributed by 17 local distributors. Similarly, Table 2 shows materials used to convey runoff from the roof into storage tanks or cisterns. This table also shows sealants and adhesives used in rainwater catchment systems. A total of 34 different products are listed, which are manufactured by 11 manufacturers and distributed locally by eight distributors. Table 3 consists of 11 coatings and other products used in storage tanks or cisterns; these are produced by six manufacturers and distributed locally by seven distributors. Overall 167 products, 64 manufacturers, and 17 distributors are listed.

Table 4, on the other hand, is a compilation of all the hazardous chemicals found in the products listed in Tables 1, 2, and 3. This table shows the maximum contaminant levels (MCLs) of the chemicals as suggested by the Occupational Safety and Hazard Administration (OSHA) and the American Conference of Government Industrial Hygienists (ACGIH). The remarks column expresses the possible health hazard of the chemical based on what is known of that particular chemical, and not necessarily the product of which it is a constituent. Some of the hazardous chemicals listed are known to have serious health effects. Some are known carcinogens.

Tables 1, 2 and 3 also show products with readily available Material Safety Data Sheets (MSDSs) and/or letters certifying that they are safe for use in rainwater catchment systems intended for human consumption. These documents were obtained from distributors and manufacturers. The majority of the distributors had no available MSDSs or letters of certification to affirm the safe usage of their products in rainwater catchment systems. In fact, only nine products had the necessary laboratory certification and/or approval by the NSF and the U.S. Food and Drug Administration (FDA).
The MSDSs found in Appendix A list, among other data, the hazardous ingredients of each product along with OSHA's permissible exposure limit (PEL), ACGIH's threshold limit value (TLV) and in some cases the short term exposure limit (STEL). Health hazard data are also provided. The toxic chemicals that are reported on the MSDSs are subject to the reporting requirements of Section 313 of the Emergency Right-to-Know Act of 1986 and 40 CFR 372. Many ingredients are not listed on the MSDSs and are, instead, replaced by quotations such as:

"Ingredients not precisely identified are proprietary or non-hazardous."

and

"Remaining ingredients are not regulated by OSHA and are considered trade secrets."

It must be borne in mind that the limits set by OSHA and ACGIH were not specifically set for RWCSs and do not take into account the effects of weathering on the surface coatings. The effects of environmental variables such as repeated wetting and drying and acid rain need to be investigated further. Such inadequacy was highlighted by this quote from MSDSs for Waterplug, Thoroseal and Acryl 60:

"No toxicity information is available on this specific preparation; thus health hazard assessment is based on information that is available on its components."

and

"Values (MCLs) are not product specifications."

For a hazardous chemical to be listed as a health hazard on an MSDS, it must comprise 1% or greater of the composition of the product. If the chemical is a carcinogen, however, it is listed if it comprises 0.1% or greater of the product's composition. Chemicals that are likely to be released from the mixture in concentrations that would exceed an established OSHA permissible exposure limit or ACGIH threshold limit value are also listed, even if they comprise less than 1% (0.1% for carcinogens) of the mixture.

For an assessment of the market distribution of the coatings, a sample of 20 contractors were interviewed. Most contractors use more than one roof coating. The most
For an assessment of the market distribution of the coatings, a sample of 20 contractors were interviewed. Most contractors use more than one roof coating. The most widely used catchment surface is galvanize, with 39% of contractors endorsing its usage. Topcoat followed second with 29%. Tropicat was favored by 11%, and 7% favored galvalume. Metal panels, Acrylic Barrier Coating, Snow Roof Elastoseal and Master Craft were equally favored by 4% of contractors.

For the conveyance part of the catchment system, 62% favored metallic (aluminum or galvanize) gutters while 31% favored plastic piping. Wooden gutters with a layer of topcoat was favored by 6% of the contractors. Eighty percent of contractors favored plastic downspouts while the other 20% favored metallic downspouts.

Thoroseal is the most widely used cistern coating with 79% of contractors endorsing its usage. White cement, Vandex, and hydraulic cement were equally favored by the remaining contractors.

Letters certifying that the product has been laboratory tested and/or approved for use in rainwater catchment systems are found in Appendix D. All specification data are in Appendix B while Appendix C is a listing of manufacturers' addresses.
Table 1. Product List of Roof Coatings
* Approved for potable water tank lining by NSF, FDA, Clayton Labs, Environmental Consultants Ltd., and Bermuda Department of Health.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>DESCRIPTION</th>
<th>DISTRIBUTOR</th>
<th>MANUFACTURER</th>
<th>MSDS</th>
</tr>
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<tbody>
<tr>
<td>Acryl 60</td>
<td>Cement Sealant</td>
<td>Island Block</td>
<td>Thoro System Products Inc</td>
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<td>Acrylic Barrier Coating</td>
<td>Acrylic coat for plywood</td>
<td>Rooftops/Tech. Coating</td>
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<td>Acrylic Gloss Finish</td>
<td>Polyurethane Coat for metal</td>
<td>A-Z Paint Supply</td>
<td>Finnaren/Haley Paint</td>
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<td>Polyurethane Primer for metal</td>
<td>A-Z Paint Supply</td>
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</tr>
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<td>Acrylic Supercoat</td>
<td>Acrylic Emulsion coating</td>
<td>Rooftops</td>
<td>Scotts Paint Corp.</td>
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<td>AF-103 Neoprene Fluid</td>
<td>Waterproofing Coating</td>
<td>Sea Chest</td>
<td>Chemical Coatings</td>
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<td>Anvil Acrylic Latex</td>
<td>wood/ metal primer</td>
<td>Barry Duncan Ent.</td>
<td>Anvil Paints/Coating</td>
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<td>Barry Duncan Ent.</td>
<td>Anvil Paints/Coating</td>
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<td>Anvil Paints/Coating</td>
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<td>Manuf. American Standard Felt</td>
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<td>Parks Corp.</td>
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<td>Gibson-Homans Co.</td>
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<td>Mobile Paint Caribbean Inc.</td>
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<td>Asphalt/Water Proofing coating</td>
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<td>OSI RS 225/255/600</td>
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<td>Oxido Rojo Coat</td>
<td>Wood/Metal Primer</td>
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<td>Nichols Aluminum</td>
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<td>Painted Alum. Coiled Sheets</td>
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<td>Patch Works</td>
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<td>Rain Guard</td>
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<td>Reliance Caribbean</td>
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<td>K-Mart Corp.</td>
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<td>Rooftop Coating</td>
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<td>Butyl-flux</td>
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<td>Chalking sealant</td>
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<td>Cement coat</td>
<td>Island Block</td>
<td>Thoro System Products Inc</td>
<td>No</td>
</tr>
<tr>
<td>Thoroseal</td>
<td>Cement coat</td>
<td>Mike's Paint Store</td>
<td>Thoro System Products Inc</td>
<td>No</td>
</tr>
<tr>
<td>Tuff Tank</td>
<td>Roto plastics storage</td>
<td>Sea Chest</td>
<td>Thoro System Products Inc</td>
<td>No</td>
</tr>
<tr>
<td>Vandex</td>
<td>Water Proofing</td>
<td>Cash and Splash Supplies</td>
<td>Rotoplastics Trinidad Ltd.</td>
<td>No *</td>
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<tr>
<td>Water Plug</td>
<td>Hydrolic Cement</td>
<td>Mike's Paint Store</td>
<td>Vandex Caribbean</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thoro System Products Inc</td>
<td>No</td>
</tr>
<tr>
<td>Substances</td>
<td>Classification</td>
<td>M</td>
<td>C</td>
<td>L</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------</td>
<td>-----</td>
<td>----</td>
<td>-----</td>
</tr>
<tr>
<td>Ammonia</td>
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<td>25 ppm</td>
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<td>25 ppm</td>
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<tr>
<td>Asphalt</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyvinyl Acetate</td>
<td>Organic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butyl Benzylphthalate</td>
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<td></td>
<td></td>
<td>5 mg/l</td>
</tr>
<tr>
<td>Emulsifier</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Ethylene Glycol</td>
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<td>Butyl Glycol</td>
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<td>Talc</td>
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<td>&quot;Wood Dust&quot;</td>
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<td>(15 min.) 10 mg/l</td>
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<td>Iron</td>
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<td>Calcium Carbonate</td>
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</tr>
<tr>
<td>Hydrocarbon Polymer</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Silicate</td>
<td>Inorganic</td>
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<td></td>
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<td>Magnesium</td>
<td>Inorganic</td>
<td>10 mg/l</td>
<td></td>
<td>15 mg/l</td>
</tr>
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<td>Monobutyl Ether</td>
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<td></td>
</tr>
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<td>2,2,4-trimethyl 1,3-pentane diol</td>
<td>Organic</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Monoisobutyrate</td>
<td>Organic</td>
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<td></td>
</tr>
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<td>Substances</td>
<td>Classification</td>
<td>OSHA-PEL</td>
<td>STEL</td>
<td>ACGIH-TLV</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------</td>
<td>----------</td>
<td>------</td>
<td>-----------</td>
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<tr>
<td>Silicone Dioxide</td>
<td>Inorganic</td>
<td>25 &quot;mppcf&quot;</td>
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<td>10 mg/l</td>
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<td>Ammonium Hydroxide</td>
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<td>Methyl Isobutyl Ketone</td>
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<td>Cyclohexanone</td>
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<td>Methylene Chloride</td>
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<td>Organic</td>
<td>5 mg/l</td>
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<td>Dibutyl Phthalate</td>
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<td>Silica, Crystalline Quartz</td>
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<tr>
<td>Acrylic Polymer</td>
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</tr>
</tbody>
</table>

OSHA: Occupational Safety and Health Administration  
PEL: Permissible Exposure Limit  
ACGIH: American Conference of Government Industrial Hygienists  
TLV: Threshold Limit Values  
STEL: Short Term Exposure Limit  
IARC: International Agency for Research and Cancer
Conclusion

This survey of water catchment system materials available in the USVI reveals that a wide range of products are being used, especially on the catchment surfaces (the roofs). Few of these products have been approved for use in water catchment systems intended for human consumption. The components of many of these coatings are hazardous chemicals with proven health hazards. Among the health hazards are nervous and kidney damage and an increased risk of cancer.

These coatings are sold by local distributors, the majority of whom do not have material safety data sheets on hand. Furthermore, most of the large distribution outlets either had no MSDSs or were reluctant to provide them. In some cases it seemed that some of the personnel involved had no idea what MSDSs were.

Manufacturers and distributors should be cognizant of the reporting requirements of 40 CFR 372 (Toxic Chemical Reporting: Community Right-to-Know) and of 40 CFR 370 (Hazardous Chemical Reporting: Community Right-to-Know). For example, 40 CFR 372: Subpart C - Supplier Notification Requirement, states that:

"(a) Except as provided in paragraphs (c), (d) and (e) of this section and 372.65, a person who owns or operates a facility or establishment which ... (2) manufactures (including imports) or processes, (3) sells or otherwise distributes a mixture or trade name product containing a toxic chemical to (i) a facility, or (ii) to a person who in turn may sell or otherwise distributes such mixture or trade name product to a facility described in 372.22 (b), must notify each person to whom the mixture or trade name product is sold or otherwise distributed from the facility or establishment in accordance with paragraph (b) of this section."

Additionally, 29 CFR 370 states that chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated.
To determine the quantity of a hazardous chemical in a mixture, the concentration of the hazardous chemical in weight percent (greater than 1% or 0.1% if carcinogenic) shall be multiplied by the mass (in pounds) of the mixture. Those who are not aware of the necessity to perform this calculation or who cannot do it will not know if these limits are exceeded in a particular product.

The survey had its limitations and difficulties. One of the principal difficulties was the reluctance of some distributors to cooperate in this venture. Many received the survey forms by fax or by mail and failed to return them with information requested although they were sent a letter from the Commissioner of the Department of Planning and Natural Resources asking them to cooperate. Many were reluctant to discuss the products, provide information on accessing manufacturers and in general not willing to cooperate. On the other hand, some distributors were very helpful and did far more than they were required to do. Their assistance is acknowledged and greatly appreciated.

Another limitation was the lack of responses from some St. Croix hardware stores and the financial inability of WRRI to have personnel on the ground to conduct on-site visits as part of the St. Croix survey. Follow-up calls to these establishments were not effective. It is our hope that most of the products used on St. Croix are similar to those used on St. Thomas.

An additional limitation of the survey was the failure to reach the target of 50 contractors, to make an assessment of the market distribution of the products since they are the ones who actually use them. In the aftermath of recent hurricanes, with the construction industry very active, getting input from contractors was virtually impossible.

Despite the outlined limitations, the survey has developed a list of products used in rainwater catchment systems in the U.S. Virgin Islands, along with information on manufacturers, distributors, toxicity and possible health hazards.

It is strongly recommend that all the products utilized in RWCSs be tested and certified to ensure that they are safe before they are approved for such usage. This quote from the Regulation of Drinking Water under the Safe Drinking Water Act (SDWA): Consumer Education Guide, page 2, summarizes both our hopes and fears that

"cancer-causing substances, in particular, have received a high degree of attention because of the assumption that there is no threshold limit below which a cancer-causing substance does not pose some risk, however small."
References


APPENDIX A

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MATERIAL SAFETY DATA SHEETS

I. ROOF COATINGS
MATERIAL SAFETY DATA SHEET

MSDS NUMBER: 1574-NAD
PRODUCT NAME: PAINTED ALUMINUM COILED SHEET

MSDS ID CODE: ND
PART NUMBER(S): ALLOYS

Section I  General Information

PRODUCT NAME: PAINTED ALUMINUM COILED SHEET
SYNONYMS: ALUMINUM

MANUFACTURER: NICHOLS ALUMINUM
DIVISION: NICHOLS ALUMINUM
MFG PART NUMBER:
ADDRESS: 1725 ROCKINGHAM RD,
CITY: DAVENPORT
EMERGENCY PHONE: 319/328-6371
OTHER CALLS: 319/324-2121

STATE: IA ZIP: 52802

VENDOR: NICHOLS ALUMINUM
MSDS PREPARED BY: DAVE PETERS
DATE PREPARED: 03/14/94

*************** ADDITIONAL INFORMATION ***************

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. VENDOR Assumes NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT ADHERED TO AS STIPULATED IN THE DATA SHEET. ADDITIONALLY, VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED. FURTHERMORE, VENDEE ASSUMES THE RISK IN HIS USE, STORAGE, AND HANDLING OF THE MATERIAL.

Section II  Hazardous Ingredients/Identity Information

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>CAS NUMBER</th>
<th>PERCENTAGE</th>
<th>EXPOSURE LIMITS</th>
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</thead>
<tbody>
<tr>
<td>MANGANESE</td>
<td>7439-96-5</td>
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<td>OSHA PEL: 10MG/M3</td>
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<td></td>
<td></td>
<td>ACGIH TLV: 15MG/M3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OTHER:</td>
</tr>
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</table>
MATERIAL SAFETY DATA SHEET

MSDS NUMBER: 1574-NAD
PRODUCT NAME: PAINTED ALUMINUM COILED SHEET

Section II Hazardous Ingredients/Identity Information - (CONT.)

SECTION 313 CHEMICALS

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</thead>
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<td>96</td>
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<td>ACGIH TLV: 10.0 MG/M3</td>
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<td></td>
<td>OSHA PEL: 10MG/M3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OTHER: 5.0 MG/M3</td>
</tr>
</tbody>
</table>

SECTION 313 SUPPLIER NOTIFICATION


Section III Physical/Chemical Characteristics

| BOILING POINT | 4442F |
| MELTING POINT | 1220F |
| FREEZING POINT | ND |

| EVAPORATION RATE | BASIS (NA RATE) = 1 |

| PERCENT VOLATILE | BY VOLUME | ND |
| PH INFORMATION | pH VALUE: NA, CONCENTRATION: ND |
| SOLUBILITY IN WATER | NIL (% BY WEIGHT) |
| REACTIVITY IN WATER | NO DATA |

VARIOUS COLORED COATINGS, SILVER METALLIC BASE.

*************** ADDITIONAL INFORMATION ***************

MATERIAL IS (AT NORMAL CONDITIONS): SOLID

Section IV  Fire And Explosion Hazard Data

NFPA CODES: HEALTH ........: 0 FLAMMABILITY ....: 1 REACTIVITY ......: 0 OTHER ...........: U

HMIS CODES: HEALTH ........: ND FLAMMABILITY ....: ND REACTIVITY ......: ND PROTECTION ......: ND

FLAMMABLE LIMITS IN AIR
UPPER LIMIT ........: NA
LOWER LIMIT ........: NA

FLASH POINT
VALUE ........: >200

METHOD USED : ND

AUTOIGNITION TEMPERATURE: NA

EXTINGUISHING MEDIA:
COVER FIRE WITH SAND, MAT, OR FLAX
(BURLAP) SACKS. WATER SPRAY IS DANGEROUS
IN EARLY STAGE OF FIRE. NOTE CHIR591

SPECIAL FIRE FIGHTING PROCEDURES:
DO NOT USE WATER OR FOAM.
SMALL FIRE: DRY CHEMICAL, SODA ASH, LIME
OR SAND.
LARGE FIRE: WITHDRAW FROM AREA AND LET
FIRE BURN.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
DAMP ALUMINUM DUST MAY SPONTANEOUSLY
HEAT WITH LIBERATION OF HYDROGEN TO FORM
EXPLOSIVE AIR MIXTURES. (SEE ADDITIONAL
INFORMATION, SECTION VIII, HEREIN.)

Section V  Reactivity Data

IS THIS CHEMICAL STABLE UNDER NORMAL CONDITIONS OF HANDLING/STORAGE (Y/N)? Y

CONDITIONS TO AVOID (REGARDING STABILITY):
(SEE OTHER SECTIONS HEREIN.)
MATERIAL SAFETY DATA SHEET

MSDS NUMBER: 1574-NAD
PRODUCT NAME: PAINTED ALUMINUM COILED SHEET

Section V  Reactivity Data - (CONT.)

INCOMPATIBILITY (MATERIALS TO AVOID):
  ANHYDROUS BROMINE. HALOCARBONS,
  MERCURY (AMALGAM), CHLORINE,
  IODINE, (ALUMINUM+SALIUM, NITRATE
  +SALIUM, NITRATE+KPOSSLIUM,
  NITRATE+SULFUR+ORGANIC MATTER).

HAZARDOUS DECOMPOSITION PRODUCTS:
  (SEE OTHER SECTIONS HEREIN.)

HAZARDOUS POLYMERIZATION POSSIBLE (Y/N)? N

CONDITIONS TO AVOID (REGARDING POLYMERIZATION):
  NA

Section VI  Health Hazard Data

ROUTES OF ENTRY:
  INHALATION, EYES

SIGNS AND SYMPTOMS OF ACUTE OVEREXPOSURE:
  INHALATION: NOT LIKELY UNLESS MATERIAL MACHINED,
  WELDED OR REMELTED. SHORT TERM OVEREXPOSURE TO
  WELDING FUMES MAY RESULT IN DISCOMFORT SUCH AS
  DIZZINESS, NAUSEA, OR DRYNESS OR IRRITATION OF
  THROAT AND NOSE. INGESTION: NOT LIKELY. SKIN:
  NOT LIKELY. EYES: MAY IRRITATE EYES WHEN WELDING
  OR PLASMA CUTTING. SHORT TERM OVEREXPOSURE TO
  SOLVENT FUMES MAY OCCUR.

CHRONIC OVEREXPOSURE:
  NA

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
  NA

CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN
  NATIONAL TOXICOLOGY PROGRAM  IARC MONOGRAPHS  OSHA
  (Y/N): N  (Y/N): N  (Y/N): N

*************************** ADDITIONAL INFORMATION ****************************

(THRESHOLD LIMIT VALUE: SEE SECTION II.)
Emergency And First Aid Procedures

EMERGENCY PHONE NUMBER OF MANUFACTURER: 319/328-6371

INHALATION:
NA

EYE CONTACT:
FOR EYE CONTACT, FLUSH WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

SKIN CONTACT:
FOR SKIN CONTACT, REMOVE PARTICLES BY THOROUGHLY WASHING WITH SOAP AND WATER.

INGESTION:
NA

Section VII Precautions For Safe Handling And Use

HAZARD CLASS ...: 4.3 DANGEROUS WHEN WET
US DOT ID ......: SOLID
UN/NA NUMBER ...: UN1395

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
1. HALOGEN ACIDS AND SODIUM HYDROXIDE IN CONTACT WITH ALUMINUM MAY GENERATE EXPLOSIVE MIXTURES OF HYDROGEN.
2. FINELY DIVIDED ALUMINUM WILL FORM EXPLOSIVE MIXTURES IN AIR.
3. THE WELDING OF ALUMINUM ALLOYS MAY GENERATE CARBON MONOXIDE, CARBON DIOXIDE, OZONE, NITROGEN OXIDES, INFRARED RADIATION AND ULTRAVIOLET RADIATION.
4. COATING MAY BURN IF EXPOSED TO IGNITION SOURCE AT HIGH TEMPERATURES.

OTHER PRECAUTIONS:
NA

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
NA

WASTE DISPOSAL METHODS:
USED OR UNUSED PRODUCT SHOULD BE TESTED TO DETERMINE HAZARD STATUS AND DISPOSAL REQUIREMENTS UNDER FEDERAL, STATE, OR LOCAL LAWS AND REGULATIONS. DISPOSER MUST COMPLY WITH FEDERAL,
Section VII  Precautions For Safe Handling And Use - (CONT.)

STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS.

Section VIII  Control Measures

RESPIRATORY PROTECTION:
PERSONAL PROTECTIVE EQUIPMENT IS REQUIRED WHEN MACHING,
GRINDING, WELDING OR REMELTING
THIS PRODUCT. FACE/EYE PROTECTION, RESPIRATORY
PROTECTION AND PROTECTIVE CLOTHING APPROPRIATE TO THE
TASK SHOULD BE USED.

VENTILATION REQUIREMENTS:
SEE ABOVE

LOCAL EXHAUST:
SEE ABOVE

MECHANICAL:
NA

SPECIAL:
'NA

OTHER:
NA

EYE PROTECTION:
(SEE PERSONAL PROTECTIVE EQUIPMENT, BELOW)

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
(SEE PERSONAL PROTECTIVE EQUIPMENT, BELOW)

WORK/HYGIENIC PRACTICES:
ND

*************** ADDITIONAL INFORMATION ***************

PERSONAL PROTECTIVE EQUIPMENT:
APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT IS REQUIRED WHEN MELTING, CASTING,
MACHINING, FORGING, OR OTHERWISE PROCESSING. THE NATURE OF THE PROCESSING
ACTIVITY WILL DETERMINE WHAT FORM OF EQUIPMENT IS NECESSARY, I.E., GLASSES,
RESPIRATOR, PROTECTIVE CLOTHING, AND EAR PROTECTION.

NA = NOT APPLICABLE
ADDITIONAL INFORMATION

1. HALOGEN ACIDS AND SODIUM HYDROXIDE IN CONTACT WITH ALUMINUM MAY GENERATE EXPLOSIVE MIXTURES OF HYDROGEN.

2. FINELY DIVIDED ALUMINUM WILL FORM EXPLOSIVE MIXTURES IN AIR. IT WILL ALSO FORM EXPLOSIVE MIXTURES IN AIR IN THE PRESENCE OF BROMATES, IODATES, OR AMMONIUM NITRATE.

3. WHEN REMELTING ALUMINUM SCRAP, ENTRAPPED MOISTURE OR THE PRESENCE OF STRONG OXIDIZERS SUCH AS AMMONIUM NITRATE COULD CAUSE AN EXPLOSION. THIS APPLIES TO THE COLLECTION OF MOISTURE IN SOW CAVITIES AS WELL. MOISTURE MUST BE DRIVEN OFF PRIOR TO REMELTING.

4. DO NOT TOUCH CAST ALUMINUM METAL OR HEATED ALUMINUM PRODUCT WITHOUT KNOWING METAL TEMPERATURE. ALUMINUM EXPERIENCES NO COLOR CHANGE DURING HEATING. IF METAL IS HOT AND TOUCHED, BURNS CAN RESULT.

5. ALUMINUM POWDER MUST BE PACKAGED AND SHIPPED AS A FLAMMABLE SOLID, UN1396.

6. HARD ALLOY INGOTS IN THE 2000 AND 7000 SERIES MUST BE STRESS-RELIEVED TO PREVENT EXPLOSION WHEN SAWED.

7. THE WELDING OF ALUMINUM ALLOYS MAY GENERATE CARBON MONOXIDE, CARBON DIOXIDE, OZONE, NITROGEN OXIDES, INFRA-RED RADIATION AND ULTRA-VIOLET RADIATION.

---------------------------------------------
THE INFORMATION IN THIS MSDS WAS OBTAINED FROM SOURCES WHICH WE BELIEVE ARE RELIABLE. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED REGARDING THE ACCURACY OR CORRECTNESS.

THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

**************************** GENERAL INFORMATION ****************************

VD= NO DATA AVAILABLE
ASPHALT FELTS

PRODUCT INFORMATION

PRODUCT NAME(S)
-15 Premium Gold 432 sq. ft.
-15 Plain 432 sq. ft.
-15 Plain 400 sq. ft.
-15 Plain 324 sq. ft.
-15 Plain 216 sq. ft.
-15 Perforated 432 sq. ft.
-15 "Generic" 432 sq. ft.
-30 Premium Gold 216 sq. ft.
-30 Plain 216 sq. ft.
-30 Plain 18"/"split" rolls
-30 Perforated 216 sq. ft.
-30 "Generic" 216 sq. ft.
-Multi-Purpose 432 sq. ft.
-Multi-Purpose 400 sq. ft.
-Multi-Purpose 216 sq. ft.
-Slaters Felt 432 sq. ft.
-Rugged Sheathing 432 sq. ft.
-Rugged Sheathing 500 sq. ft.

BRAND NAME

AMERICAN SATURATED FELT, INC.

ADDRESS
47 Maple Avenue
P. O. Box 550
Thomaston, CT 06787

PHONE NUMBERS
Connecticut: 203-283-8239
Fax: 203-283-0308

PRODUCT USE
On flat roofs: For Built-up Roofing (BUR)
On inclined roofs: As underlayment under shingles.
On walls: As external sheathing for waterproofing.
As general water shedding material. As water shedding breathing membrane. As air barrier for external cladding of structures.

Hazardous Ingredients

Asphalt
30% to 60%
PHYSICAL DATA

1. Physical State
   Solid (asphalt coated, surfaced sheets).

2. Odor and Appearance
   Slight petroleum odor—sheet forms
   Colored mineral granules/white
talc or sand covered
Blackish (asphaltic) colors also.

3. Specific Gravity
   1.8 to 2.5

4. Boiling Point
   Not applicable

5. Vapor Pressure
   Not applicable

6. Solubility in Water
   Not applicable

FIRE AND EXPLOSION DATA

Flash Point
(method used = COC)
Minimum 265°C (approx.)

Flammable limits in air
(% by volume)
Unknown

Auto-Ignition Temperature
370-480°C (approx.)

Fire and Explosion Hazards
Addition of water or foam may cause frothing. Flammable gas
emitted on heating.

Extinguishing Media
Water Spray, Dry chemical, carbon
dioxide for small fires.

Firefighting Procedures
Use water spray to cool fire-
exposed containers and as a
protective screen. Do not point
solid water directly into burning
asphalt to avoid spreading.
Self-contained breathing apparatus
should be worn to protect against
possible release of hydrogen
sulphide and sulphur dioxide if
material is burning.
REACTIVITY DATA

STABILITY
Stable

CONDITIONS TO AVOID
Excessive heat approaching flash point.

MATERIALS TO AVOID
Oxidizing agents, Strong acids.

HAZARDOUS DECOMPOSITION
CO\textsubscript{x}, SO\textsubscript{x}, NO\textsubscript{x}
Sulphur compounds, smoke on combustion

HAZARDOUS POLYMERIZATION
Not known to happen.

ENVIRONMENTAL AND DISPOSAL INFORMATION

Product as produced is in solid state. For disposal use standard approved waste disposal procedures. If product has been affected by heat or fire and asphalt in fluid state has been released from the product then, allow to cool and solidity. Break it up and collect in appropriate containers such as drums. Dispose of it through approved waste disposal method such as land fill, etc.

HEALTH HAZARD DATA

This manufactured product as produced and when used under ambient conditions poses no health hazard.

However, if the product is heated beyond 200\textdegree C or if it catches fire, then, the major constituent asphalt (bitumen) will emanate slightly toxic fumes. Melted asphalt (bitumen from the product could act as a fuel and contribute to the fire.

TOXICITY DATA

The international Agency for Research on Cancer states that there is inadequate evidence that bitumens alone are carcinogenic to humans.

EFFECTS OF OVEREXPOSURE

INHALATION
Fumes from hot asphalt cause nausea, headache, dizziness.

SKIN AND EYES
Hot asphalt burns skin and eyes. Prolonged or repeated skin contact may cause dermatitis.
INGESTION

Ingestion is unlikely.

NOTE:

Under extreme heat, product may liberate hot fluid asphalt.

FIRST AID

EMERGENCY AND FIRST AID PROCEDURES INFORMATION

SKIN

For hot asphalt splash, cool part by water immersion or shower. Do not attempt removal of asphalt but split longitudinally if circumferential to avoid tourniquet effect. For skin soiling without underlying burn, cleanse with mineral oil followed by soap and water. Use olive oil in vicinity of eyes.

EYES


INHALATION

Evacuate to fresh air. Apply Cardiac Pulmonary Resuscitation if required, physician assessment mandatory.

INGESTION

Not applicable.

HANDLING PRECAUTIONS

For product as produced no special protection is essential other than wearing of gloves to protect hands from physical scratches or asphaltic stains.

ADDITIONAL INFORMATION

For product as produced and used, no special procedures of safety are essential.

Should product catch fire through external source remain upwind of fire. Avoid skin and eye contact, avoid inhalation of fumes.

SINCE THIS PRODUCT IS A "MANUFACTURED ARTICLE" AMERICAN SATURATED FELT, INC. IS NOT REQUIRED BY LAW TO PRODUCE A MATERIAL SAFETY DATA SHEET. THIS MATERIAL SAFETY DATA SHEET IS PROVIDED AS A CUSTOMER SERVICE INFORMATION.

THE RECOMMENDATIONS AND DATA PRESENTED ARE BELIEVED TO BE CORRECT, HOWEVER NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THE RESULTS OBTAINED FROM THE USE OF THIS INFORMATION.

A-12
Material Safety Data Sheet (MSDS)

Bird Vinyl Siding Products meet the "Article" Definition as outlined in the Federal Register, Volume 48, N. 228, November 25, 1983. P. 53340.

REQUIREMENTS
Formed to a specific shape or design during manufacture.

End use functions are dependent in whole or in part upon its shape or design during end use.

Does not release or otherwise result in exposure to a hazardous chemical under normal conditions of use.

APPLICABILITY
All Bird Vinyl Products are dimension specific.

Bird Vinyl Products function properly partly due to their shapes and/or profiles.

Bird Vinyl Products are fused in manufacture. This encapsulates any potentially hazardous chemical.

Since Bird Vinyl Products meet the "Article" classification, Bird Vinyl Products would be exempt from the Material Safety Data Sheet (MSDS) requirement, as indicated in 1910.1200(5) (IV).
MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

TRADE NAME: CONCRETE BONDING ADHESIVE
CHEMICAL FAMILY/SYNONYM: POLYVINYL ACETATE EMULSION
MANUFACTURER: W.R. BONSAL COMPANY, P.O. BOX 241148, CHARLOTTE, N.C. 28224
EMERGENCY PHONE: (704) 525-1621  Mr. Fred Goeman

SECTION II - HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PERCENT</th>
<th>OCCUPATIONAL EXPOSURE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAS #</td>
<td>TLV</td>
</tr>
<tr>
<td>POLYVINYL ACETATE</td>
<td>PROPRIETARY</td>
<td>&lt;50</td>
</tr>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>&lt;60</td>
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<tr>
<td>BUTYL BENZYL PHTHALATE</td>
<td>85-68-7</td>
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<tr>
<td>EMULSIFIER</td>
<td>PROPRIETARY</td>
<td>2-4</td>
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<tr>
<td>ETHYLENE GLYCOL</td>
<td>107-21-1</td>
<td>&lt;.5</td>
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<tr>
<td>DIETHYLENE GLYCOL</td>
<td>111-46-6</td>
<td>&lt;.5</td>
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<tr>
<td>TALC</td>
<td>14807-96-6</td>
<td>&lt;.5</td>
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SECTION III - PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT (°F)</th>
<th>212°</th>
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</thead>
<tbody>
<tr>
<td>SPECIFIC GRAVITY (H₂O=1)</td>
<td>1.06</td>
</tr>
<tr>
<td>% VOLATILE BY VOLUME (%)</td>
<td>59-62</td>
</tr>
<tr>
<td>VAPOR PRESSURE (mmHg)</td>
<td>NA</td>
</tr>
<tr>
<td>VAPOR DENSITY (AIR-1)</td>
<td>LIGHTER</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>DILUABLE</td>
</tr>
</tbody>
</table>

APPEARANCE & ODOR: Milky, white or pink with faint odor.

SECTION IV - FIRE & EXPLOSION HAZARD DATA

FLASH POINT: None to boiling

FLAMMABLE LIMITS |

EXTINGUISHING MEDIA: For dry solids use water, foam, CO₂, or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Water may be used to keep fire exposed containers cool.

MISCELLANEOUS FIRE AND EXPLOSION HAZARDS: Closed containers exposed to extreme heat may rupture due to pressure build up.

Page 1 of 2  NOV-95
SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 5mg/m³ FOR BENZYL PHTHALATE

EFFECTS OF OVEREXPOSURE: May cause skin or eye irritation upon prolonged or repeated contact.

EMERGENCY FIRST AID: Eyes: Hold lids apart, flush with GENTLE stream of water for 15 minutes. See a physician. Wash thoroughly with soap and water after use. If ingested, drink 2-3 cups of milk, fruit juice or water. If unusual symptoms develop, seek medical attention.

SECTION VI - REACTIVITY DATA

STABILITY: UNSTABLE _______ STABLE X

CONDITIONS TO AVOID: NA

INCOMPATABILITY (MATERIALS TO AVOID): NA

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may yield CO₂ and/or race of monomer.

HAZARDOUS POLYMERIZATION: MAY OCCUR _______ WILL NOT OCCUR X

CONDITIONS TO AVOID: NA

SECTION VII - SPILL OR LEAK PROCEDURES

IN CASE MATERIAL IS RELEASED OR SPILLED: Flush with water into suitable retaining area or container. Small amount of spilled material may be absorbed. Prevent spilled material from entering sewers, storm drains.

WASTE DISPOSAL METHOD: Dispose of in accordance with applicable local, county, state and federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (TYPE): NIOSH approved, if vapor concentration exceeds NIOSH TLV.

VENTILATION: Time weighted TLV.

Local Exhaust: Special: NA

Mechanical: Yes to within time wtd. TLV Other:

PROTECTIVE GLOVES: Yes, Rubber

EYE PROTECTION: Safety glasses, goggles, face shield.

OTHER PROTECTIVE EQUIPMENT: Yes washers, safety showers, long sleeve clothing.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS IN HANDLING AND STORING: Keep containers cool, dry and away from sources of ignition. Use and store with adequate ventilation. Keep containers closed.

OTHER PRECAUTIONS: Do not allow to freeze or subject to extreme temperature variations.

Page 2 of 2
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CARIBBEAN ROOF ELASTO - WHITE
PRODUCT CODE: 221470
HMIS CODES: H F R P

------------ SECTION I - MANUFACTURER IDENTIFICATION ------------

MANUFACTURER'S NAME: MOBILE PAINT MANUFACTURING CO., INC.
ADDRESS: P.O. BOX 717, THEODORE, AL 36582
EMERGENCY PHONE: 1-334-265-9574
INFORMATION PHONE: (334) 443-8116
DATE REVISED: 01-15-91
NAME OF PREPARER: JULIE HOLLAND

---------- SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION -----

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>OCCUPATIONAL EXPOSURE LIMITS</th>
<th>VAPOR PRESSURE</th>
<th>HAZARDOUS MATERIAL</th>
<th>INITIAL REACTIVITY</th>
<th>MAX. TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLYURETHANE</td>
<td>N/A</td>
<td>18-43.2</td>
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<td>NA</td>
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<tr>
<td>POLYURETHANE</td>
<td>N/A</td>
<td>18-43.2</td>
<td>18-43.2</td>
<td>NA</td>
<td>NA</td>
</tr>
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Remember to consult your employer on the reporting requirements of section 113 of Title VIII and of 40 CFR PS.

---------- SECTION III - PHYSICAL/ CHEMICAL CHARACTERISTICS ---------

BOILING POINT: 170-320 Deg F
SPECIFIC GRAVITY (H2O=1): 1.4
VAPOUR DENSITY: LIGHTER THAN AIR
EVAPORATION RATE: SLOWER THAN WATER
COATING V.O.C.: 100-200 LEVEL
SOLUBILITY IN WATER: DILUTABLE
APPEARANCE AND ODOR:

---------- SECTION IV - FIRE AND EXPLOSION HAZARD DATA ----------

FLASH POINT: NO FLASH
METHOD USED: N/A
FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER: 3.2% UPPER: N/A

EXTINGUISHING MEDIA: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIREFIGHTING PROCEDURES
CLOSED CONTAINERS MAY EXPLODE, DUE TO THE BUILD-UP OF STEAM PRESSURE WHEN EXPOSED TO EXTREME HEAT. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE EXPLOSION WHEN EXPOSED TO EXTREME HEAT.

UNUSUAL FIRE AND EXPLOSION HAZARDS
MATERIAL MAY SMOKE WHEN TEMPERATURE GOES ABOVE 212 F. DRIED SOLIDS MAY BURN, GIVING OFF SMOKE AND CARBON.
SECTION V - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID


INCOMPATIBILITY (MATERIALS TO AVOID)


HAZARDOUS DECOMPOSITION OR BYPRODUCTS


HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

HEALTH HAZARDS (ACUTE AND CHRONIC)

CARCINOGENICITY: NTP? O IARC MONOGRAPHS? NO OSHA REGULATED? NO

MEDICAL CONDITIONS GENERALLY AGRAVATED BY EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: REMOVE TO FRESH AIR.

SKIN CONTACT: REMOVE WITH SOAP AND WATER, REMOVE ANY LEASER CONTAMINATED CLOTHING BEFORE SENSE.

EYE CONTACT: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SEEK A PHYSICIAN FOR MEDICAL TREATMENT.

INGESTION: DRINK 1 OR 2 GLASSES OF WATER TO DILUTE. DO NOT INDUCE VOMITING. SEEK A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY. TREAT symptomatically. never give anything by mouth to an unconscious person.
MATERIAL SAFETY DATA SHEET

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

- Use caution to avoid falls. Do not absorb with inert material, transfer to container for disposal.
- Keep spills out of municipal sewers and open bodies of water.

WASTE DISPOSAL METHOD

- Dispose of in accordance with local, state and federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

- Do not store with incompatible materials.
- Do not expose to air or moisture.
- Use with adequate ventilation to avoid contact with skin and clothing. Wash thoroughly after handling.

OTHER PRECAUTIONS

- Do not handle until the manufacturer's safety instructions have been read and understood.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION

- Use a NIOSH-approved respirator of appropriate type.
- Never use the product in atmospheres of deficiency.

VENTILATION

- Ensure ventilation is adequate and that the area is safe for the operation.

PROTECTIVE GLOVES

- Use gloves appropriate to the material handled.

EYE PROTECTION

- Use safety glasses or face shields as recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

- Use protective clothing and prevent spilled liquid from contact to contaminated clothing.

SECTION IX - DISCLAIMER

DISCLAIMER

- The information provided in this MSDS has been obtained from sources believed to be accurate and reliable. It is furnished without warranty of any kind, express or implied. Recipients should determine that the information is current and suitable for the protection of the environment and the health and safety of your employees and users of this product.
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: COOL COTE NON-TOXIC - RED
PRODUCT CODE: 225R009
HMIS CODES: H F R P

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: MOBILE PAINT MANUFACTURING CO. INC.
ADDRESS: P.O. BOX 717, THEODORE, AL 36582
EMERGENCY PHONE: 1-800-255-3924
DATE REvised: 01-15-91
INFORMATION PHONE: (334) 443-6110
NAME OF PREPARER: JULIE HOAGLAND

SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>CAS NUMBER</th>
<th>OCCUPATIONAL EXPOSURE LIMITS</th>
<th>VAPOR PRESSURE</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OEL</td>
<td>IDLH</td>
<td>TLV</td>
</tr>
<tr>
<td>ETHYLENE GLYCOL</td>
<td>107-21-1</td>
<td>50 ppm C</td>
<td>50 ppm C</td>
<td>125 ppm</td>
</tr>
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</table>

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 379 Deg F
SPECIFIC GRAVITY (H2O=1): 1.3
VAPOR DENSITY: LIGHTER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHYL ALCOHOL
COATING V.O.C.: 1.15 LB/GL (137 G/L)
SOLUBILITY IN WATER: DILUABLE
APPEARANCE AND ODOR:

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NO FLASH
METHOD USED: N/A
FLAMMABLE LIMITS IN AIR BY VOLUME: LOWER: 3.2% UPPER: N/A

EXTINGUISHING MEDIA: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG

SPECIAL FIREFIGHTING PROCEDURES
CLOSED CONTAINERS MAY EXPLODE, DUE TO THE BUILD-UP OF STEAM PRESSURE WHEN EXPOSED TO EXTREME HEAT. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE EXPLOSION WHEN EXPOSED TO EXTREME HEAT.

UNUSUAL FIRE AND EXPLOSION HAZARDS
MATERIAL MAY SPATTER WHEN TEMPERATURE GOES ABOVE 212 F. DRIED SOLIDS MAY BURN, GIVING OFF OXIDES OF CARBON.
MATERIAL SAFETY DATA SHEET

SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
FIRE

INCOMPATIBILITY (MATERIALS TO AVOID)
NONE

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
OXIDIZING MATERIALS WILL BE GIVEN OFF.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
MAY CAUSE HEADACHE, NAUSEA AND IRRITATION OF THE NOSE, THROAT AND LUNGS.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
POSSIBLE PRIMARY SKIN IRRITATION (MATERIAL IS SLIGHTLY ALKALINE). PRIMARY EYE IRRITATION. (SENSITIZER TO SOME PEOPLE.)

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
NONE KNOWN.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
NO KNOWN EVIDENCE OF ADVERSE HEALTH EFFECTS.

HEALTH HAZARDS (ACUTE AND CHRONIC)
NO KNOWN CHRONIC HEALTH HAZARDS.

CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
MAY PROVOKK ASTHMATIC RESPONSE IN PERSONS WITH ASTHMA WHO ARE SENSITIVE TO AIRWAY IRRITANTS.

EMERGENCY AND FIRST AID PROCEDURES
INHALATION: REMOVE TO FRESH AIR.
SKIN CONTACT: REMOVE WITH SOAP AND WATER. REMOVE AND LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
EYE CONTACT: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SEE A PHYSICIAN FOR MEDICAL TREATMENT.
INGESTION: DRINK 1 OR 2 GLASSES OF WATER TO DILUTE. DO NOT INDUCE VOMITING. CONSULT A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY. TREAT SYMPTOMATICALLY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

FLOOR MAY BE SLIPPERY, USE CARE TO AVOID FALLS. RIDE AND ABSORB WITH INERT MATERIAL, TRANSFER TO CONTAINER FOR DISPOSAL. KEEP SPILL OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER.

WASTE DISPOSAL METHOD

DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

DO NOT STORE ABOVE 120 F. DO NOT FREEZE. STORE LARGE QUANTITIES ONLY IN BUILDINGS DESIGNED TO COMPLY WITH OSHA 1910.101. KEEP CONTAINERS CLOSED. USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES AND CLOTHING. WASH THROUGHOUT AFTER HANDLING.

OTHER PRECAUTIONS

DO NOT HANDLE UNTIL THE MANUFACTURERS SAFETY PRECAUTIONS HAVE BEEN READ AND UNDERSTOOD.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION

IN OPEN AREAS USE NIOSH/MSHA APPROVED MECHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIRBORNE PARTICLES OR OVERSPRAY DURING SPRAY APPLICATION. IN RESTRICTED VENTILATION AREAS USE NIOSH/MSHA APPROVED RESPIRATOR TO REMOVE A COMBINATION OF PARTICulates AND VAPOR.

VENTILATION

PROVIDE VENTILATION IN VOLUME AND PATTERN TO KEEP TVA OF HAZARDOUS INGREDIENTS BELOW ACCEPTABLE LIMIT, LESS THAN STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS DURING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS PRODUCT.

PROTECTIVE GLOVES

USE GLOVES IMPERVIOUS TO WATER AND SOAP.

EYE PROTECTION

SAFETY EYEWEAR INCLUDING BOLTED PADS OR SIDE SHIELDS ARE RECOMMENDED.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

USE PROTECTIVE OUTERWEAR AND PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

WORK/HYGIENIC PRACTICES

WASH HANDS THOROUGHLY BEFORE EATING, SMOCKING OR DRINKING, AND AT THE END OF EACH WORK PERIOD.

SECTION IX - DISCLAIMER

DISCLAIMER

THE INFORMATION PROVIDED IN THIS MSDS HAS BEEN OBTAINED FROM SOURCES BELIEVED TO BE ACCURATE AND RELIABLE. IT IS FURNISHED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. RECIPIENTS SHOULD DETERMINE THAT THE INFORMATION IS CURRENT AND SUITABLE FOR THE PROTECTION OF THE ENVIRONMENT AND THE HEALTH AND SAFETY OF YOUR EMPLOYEES AND USERS OF THIS PRODUCT.
SECTION I. MATERIAL IDENTIFICATION

TRADE/MATERIAL NAME: DAP BLACK-TITE ROOF SEALANT

DESCRIPTION: SEALANT

CAS: MIXTURE

PREVIOUS MSDS REVISION DATE: APRIL 19, 1994

DOT INFORMATION FOR DOMESTIC GROUND TRANSPORT:
SHIPPING NAME (49 CFR 172.101): CONSUMER COMMODITY
S.O.T. HAZARD CLASS (49 CFR 172.101): 04M-0
S.O.T. ID NO. (49 CFR 172.101): NONE
S.O.T. LABEL REQUIRED (49 CFR 172.101): NONE
S.O.T. PACKAGING GROUP (49 CFR 172.101): NONE
EPA WASTE CODE-IF DISCARDED (40 CFR 261): NONE

MANUFACTURER: DAP, INC.
P.O. BOX 277
DAYTON, OH 45401-0277

PHONE: 24 HOUR EMERGENCY:
INFO TRAC 1-800-535-5053
DAP, INC. 1-800-543-3840
GENERAL INFORMATION:
DAP, INC. 1-800-543-3840

SECTION II. INGREDIENTS AND HAZARDS

INGREDIENT NAME: CAS NUMBER: PERCENT: EXPOSURE LIMITS:
MINERAL SPIRITS 64742-41-3 5-10 OSHA PEL: 500PPM TWA
MINERAL SPIRITS 6052-41-3 5-10 OSHA PEL: 100PPM TWA

REMAINING INGREDIENTS ARE NOT REGULATED BY OSHA AND ARE CONSIDERED TRADE SECRETS.

INGREDIENTS PER THE NEW JERSEY RIGHT TO KNOW ACT: CALCIUM CARBONATE 1317-65-3,
HYDRAULIC MORTAR B1, CARBONATE 14807-50-8, ASPHALT 64742-93-4, MINERAL SPIRITS 54741-41-
3. AND MINERAL SPIRITS 8052-41-3.
MATERIAL SAFETY DATA SHEET

DAP, INC.
P.O. BOX 277
DAYTON, OH 45401-0277

MSDS NO: DAP / 10004
INTERNAL ID: 10004
DAP BLACK-TITE ROOF SEALANT
REVISION: 0
DATE: JUNE 13, 1994

SECTION III. PHYSICAL DATA

APPEARANCE & ODOR: BLACK PASTE WITH A GASOLINE-LIKE ODOR

MELTING POINT: NE
VAPOR PRESSURE: 3.1 MM HG @ 20C
SOLUBILITY (WATER): NE
DENSITY (AIR=1): 1.1

STICKINESS: 0.4" MAX @ 122F FOR 10 MIN.

L FLUID WATER LESS EXCEPTED SOLVENT (GRAMS/LITER): 190-195
L MATERIAL (GRAMS/LITER): 190-195

SECTION IV. FIRE AND EXPLOSION DATA

FLASH POINT (METHOD): 129F (C.C.)
LIMITS: LEL #: NE
UEL #: NE

Distingushing Media: FOAM, CARBON DIOXIDE, DRY CHEMICALS

UNUSUAL FIRE OR EXPLOSION HAZARDS: CONTAINERS MAY EXPLODE IF EXPOSED TO EXTREME HEAT. ELIMINATE SOURCE OF IGNITION: HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAMES. DO NOT PUT IN CONTACT WITH OXIDIZING OR CAUSTIC MATERIALS.

SPECIAL FIRE-FIGHTING PROCEDURES: FULL PROTECTIVE EQUIPMENT, INCLUDING SELF-CONTAINED BREATHING APPARATUS, IS RECOMMENDED TO PROTECT FROM COMBUSTION PRODUCTS. DO NOT EXPOSE CONTAINERS WITH WATER.

SECTION V. REACTIVITY DATA

MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CHEMICAL INCOMPATIBILITIES: STRONG OXIDIZERS AND CAUSTICS
CONDITIONS TO AVOID: EXCESSIVE HEAT
Hazardous Decomposition Products: NORMAL COMBUSTION PRODUCTS. I.E. CO, NOX

THIS PRODUCT IS NOT CONSIDERED A CARCINOGEN BY NTP, IARC, OSHA

EDIDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: NONE KNOWN

FIRST ENTRY ROUTE(S): INHALATION OF SOLVENT VAPORS AND SKIN CONTACT.

ACUTE EFFECTS: MAY IRRITATE EYES, SKIN, NOSE, AND UPPER RESPIRATORY TRACT. HARMFUL IF INHALED. HARMFUL OR FATAL IF SWALLOWED. IF INGESTED THIS PRODUCT MAY CAUSE VOMITING, DIARRHEA, AND DEPRESSED RESPIRATION. INHALATION MAY AFFECT THE EARDRUM OR EARS DUCING CAUSING TINGLING, HEADACHE, OR NAUSEA.

CHRONIC EFFECT(S): REPORTS HAVE ASSOCIATED PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE WITH PROLONGED AND REPEATED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS.
HEALTH HAZARD INFORMATION CONTINUED FROM PAGE 2

FIRST AID:

EYE CONTACT: FLUSH WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES. SEE A PHYSICIAN IF IRRITATION PERSISTS.

SKIN CONTACT: WASH THOROUGHLY WITH SOAP AND WATER.

INHALATION: REMOVE TO FRESH AIR. CONTACT A PHYSICIAN IMMEDIATELY.

INGESTION: DO NOT INDUCE VOMITING. CONTACT A PHYSICIAN OR REGIONAL POISON CONTROL CENTER IMMEDIATELY.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL / LEAK PROCEDURES: USE ABSORBENT MATERIAL OR SCRAPE UP DRIED MATERIAL AND PLACE INTO CONTAINERS.

WASTE MANAGEMENT / DISPOSAL: DISPOSE OF ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS. DISCARDED MATERIAL SHOULD BE INCINERATED AT A PERMITTED FACILITY. DO NOT REUSE EMPTY CONTAINER.

SECTION VIII. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:

GOGGLES: GOGGLES OR SAFETY GLASSES WITH SIDE SHIELDS.

GLOVES: SOLVENT IMPERVIOUS GLOVES

RESPIRATOR: IF 8-HOUR EXPOSURE LIMIT OR VALUE IS EXCEEDED FOR ANY COMPONENT, USE AN APPROVED NIOSH/OSHA RESPIRATOR. CONSULT YOUR SAFETY EQUIPMENT SUPPLIER AND THE OSHA REGULATION, 29 CFR 1910.134 FOR RESPIRATOR REQUIREMENTS.

WORKPLACE CONSIDERATIONS:

VENTILATION: PROVIDE SUFFICIENT MECHANICAL VENTILATION (LOCAL OR GENERAL EXHAUST) TO MAINTAIN EXPOSURE BELOW PEL AND TLV. VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS. CHECK ALL LOW AREAS (BASEMENTS, SUMPS, ETC.) FOR VAPOR BEFORE ENTERING.

SAFETY STATIONS:

PROVIDE EYEWASH AND SOLVENT IMPERVIOUS APRON IF BODY CONTACT WITH PRODUCT OCCURS.

BARRIER CREAMS MAY BE USED.

CONTAMINATED EQUIPMENT:

WASH CONTAMINATED CLOTHING BEFORE REUSE.
MATERIAL SAFETY DATA SHEET

DAP, INC.
P.O. BOX 277
DAYTON, OH 45401-0277

MSDS NO: DAP / 10004
INTERNAL ID: 10004
DAP BLACK-TITE ROOF SEALANT
REVISION: 8
DATE: JUNE 13, 1994

SECTION IX. SPECIAL PRECAUTIONS

STORAGE SEGREGATION: STORE AWAY FROM CAUSTICS AND OXIDIZERS.

SPECIAL HANDLING / STORAGE: KEEP OUT OF REACH OF CHILDREN. KEEP CONTAINERS FROM EXCESSIVE HEAT AND FREEZING. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE.

OTHER PRECAUTIONS: INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING VAPORS MAY BE HARMFUL OR FATAL.

DOT CLASS: SEE SECTION I
UN REGISTER: SEE SECTION I

--- PAGE 4

A-25
SECTION I
Manufacturer's Name
OREGON RESEARCH & DEVELOPMENT CORPORATION
Address (Number, Street, City, State, and ZIP Code)
1835 16TH STREET S.E.
SALEM, OREGON 97302-1436

Emergency Telephone Number
911 - ASK FOR POISON CONTROL CENTER
Telephone Number for Information
1-800-245-0609
Date Prepared
JULY 10, 1991, UPDATED MAY 1994
Signature of Preparer (Optional)

SECTION II — Hazardous Ingredients/Identity Information
Hazardous Components (Specific Chemical Identity: Common Name(s))
- Pigments
- Sophisticated Rubberized Acrylic Latex
- Solvents (Water)
- Misc. inert ingredients

Contains no VOC's
ALL MATERIALS ARE WITHIN ESTABLISHED EPA LIMITS

SECTION III — Physical/Chemical Characteristics
- Boiling Point: 212°F
- Specific Gravity (H2O = 1): 1.15 ctt.
- Melting Point: N.A.
- Flash Point: N.A.
- Autoignition Temperature: 0 83-1.0
- Solubility in Water: Dilutable
- Appearance and Odor: Thick black waterbased elastic coating. Contains no petroleum. Nearly odorless except with slight ammonia smell

SECTION IV — Fire and Explosion Hazard Data
- Flash Point (Method Used): N.A.
- Flammable Limits: N.A.
- Extinguishing Media: N.A.
- Special Fire Fighting Procedures: N.A.
- Initial Fire and Explosion Hazards: N.A.
SECTION V — Reactivity Data

Stability
Unstable
Stable

Conditions to Avoid
None

Incompatibility (Materials to Avoid)
None

Hazardous Decomposition or Byproducts
Thermal decomposition may produce carbon monoxide and/or carbon dioxide.

Hazardous Polymerization
May Occur
Conditions to Avoid
None

Will Not Occur

SECTION VI — Health Hazard Data

Route(s) of Entry: Inhalation?

See Emergency and First Aid Procedures:

Health Hazards (Acute and Chronic)

N.A.

Carcinogenicity: NTP? No

IARC Monographs? No

OSHA Regulations? No

Signs and Symptoms of Exposure

N.A.

Medical Conditions Generally Aggravated by Exposure

Contains some ammonia for pH control. Mist or liquid may irritate or burn eyes, skin and mucous membranes.

Emergency and First Aid Procedures

Flush eyes and skin with water for at least 30 minutes if irritation occurs. Remove contaminated clothing. Seek medical attention as needed. Seek ventilation and fresh air as needed.

SECTION VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Since some persons might be skin sensitive, gloves are recommended. Use absorbent material and place in approved container and bury in approved landfill.

Waste Disposal Method

Collect and bury in landfill or wash into sewage treatment plant in small quantities. For large quantities, contact Environmental Protection Agency or this company.

Precautions to Be "Taken in Handling and Storage"

Best stored between 40° and 80° F. DO NOT FREEZE!

Other Precautions

N.A.

SECTION VIII — Control Measures

Respiratory Protection (Specify Type)

If sprayed, we recommend respirator filter mask suitable for spray painting, NIOSH approved.

Ventilation

Local Exhaust: Provide proper ventilation as needed

Mechanical (General): N.A.

Other: N.A.

Protective Gloves

Advisable

Eye Protection: Face shield or safety glasses, as needed

Other Protective Clothing or Equipment

Wear protective clothing as needed.

Work/Hygienic Practices

An eyewash and safety shower should be nearby and ready for use.
BETHLEHEM STEEL CORPORATION AND SUBSIDIARY COMPANIES

MATERIAL SAFETY DATA SHEET

------------------------------------ GENERAL INFORMATION ------------------------------------

Manufacturer: Bethlehem Steel Corporation
Bethlehem, PA 18016

For Additional Information, contact:
Occupational Health & Safety Division
215/694-5105 or 7066

MSDS Code: A145

------------------------------------ PRODUCT IDENTIFICATION ------------------------------------

Product Name: CALVALUME AND BETHALUME STEEL PRODUCTS

Synonym(s): NA

Chemical Family: NA

------------------------------------ TYPICAL CHEMICAL COMPOSITION (1) ------------------------------------

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<th>Ingredient (2)</th>
<th>CAS No.</th>
<th>Wt. %</th>
<th>Permissible Air Level (3)</th>
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<td></td>
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<tr>
<td>Trace Elements</td>
<td>NA</td>
<td>LT 1.0</td>
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Nonmetallic Coatings (Optional): See "Additional or Miscellaneous Information"

SEE LAST PAGE FOR IMPORTANT ADDITIONAL TERMS AND CONDITIONS INCLUDING DISCLAIMER OF WARRANTIES.

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Iron (Fe)

Subjecting iron and alloys containing iron to high temperatures (such as occur during welding) will cause the formation of iron oxide. Long-term exposure to iron oxide fumes or dusts has been associated with a benign lung condition known as siderosis which is observable as an X-ray change. No physical impairment of lung function has been linked to siderosis.

Manganese (Mn)

Mn intoxication is usually due to the oxide or salts of Mn, elemental Mn exhibits very low toxicity. The dusts and fumes can act as minor irritants to the eyes and respiratory tract. Both acute and chronic exposures may adversely affect the central nervous system (CNS), but symptoms are more likely to occur after at least 1 or 2 years of prolonged or repeated exposures. Early symptoms may include weakness, in lower extremities, sleepiness, salivation, nervousness, and apathy. In more advanced stages, severe muscular incoordination, impaired speech, spastic walking, mask-like facial expression and uncontrollable laughter may occur. Manganese fumes have also been reported to result in metal fume fever, a flu-like syndrome with symptoms such as dizziness, chills, fever, headache, and nausea. An increased incidence of pneumonia, bronchitis, and pneumonitis has been reported in some worker populations exposed to manganese. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections.

Chromium (Cr)

The toxicity and health hazards of chromium are heavily dependent upon its oxidation state. The elemental (as in the metal), divalent, and trivalent forms are of very low toxicity. The hexavalent form (such as occurs in chromates and chromic acid) is very toxic and can produce both acute and chronic effects. Adverse effects on the skin may include ulcerations, irritative dermatitis, and allergic skin reactions. Adverse effects on the respiratory system may include bronchospasm, edema, hypersecretion, bronchitis, irritation, allergic asthmatic reactions, and ulceration and perforation of the nasal septum. Respiratory symptoms may include coughing and wheezing, shortness of breath, and nasal itch. Eye irritation or inflammation can also be produced. The International Agency for Research on Cancer (IARC) has determined a "causal" association between occupational exposure to chromium and certain chromium compounds and cancer in humans. This determination was based on evidence where exposures were primarily to hexavalent chromium compounds. The American Conference of Governmental Industrial Hygienists (ACGIH) has reviewed the available data and concluded that chromium metal is not carcinogenic to humans. (NOTE: The chromium contained in this product is principally in the elemental form).

Nickel (Ni)

Ni fumes and dusts are respiratory irritants and may cause a severe pneumonitis. Skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch." Ni and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids (i.e., the conjunctiva). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.
Copper (Cu)
Inhalation of Cu fume may cause irritation of the eyes, nose, and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chills, dry throat, cough, and weakness. Cu fume may also produce a metallic or sweet taste. Repeated or prolonged exposure to Cu fume may cause discoloration of the skin and hair.

Aluminum (Al)
Particles of aluminum deposited in the eye may cause irreversible tissue damage of the cornea. Al salts may cause dermatitis, eczema, conjunctivitis, and irritation of the mucous membranes of the upper respiratory tract. Long-term inhalation exposure to Al dusts or fumes has been associated with a fibrotic lung condition known as Shaver's disease; however, the evidence for this is not conclusive since affected workers were exposed to other substances (such as silica) as well. Symptoms of this condition may include shortness of breath, cough, and fatigue.

Zinc (Zn)
Subjecting zinc or alloys containing zinc to high temperatures (such as occurs during welding) will cause the formation of zinc oxide. Exposure to zinc oxide fumes or dusts can result in a flu-like illness called metal fume fever. Early symptoms may include a sweet or metallic taste in the mouth, dryness and irritation of the throat, and coughing. These symptoms may progress to shortness of breath, headache, fever, chills, muscle aches, nausea, vomiting, weakness, fatigue, and profuse sweating. The attack may last 6-48 hours and is more likely to occur after a period away from the job. This is considered to be a nuisance particulate by Alcoa.

Usual Routes of Entry:
- Inhalation

Medical Conditions Possibly Aggravated:
- Chronic diseases or disorders of the respiratory system.

Carcinogen Information:
- NTP and IARC consider (1) chromium and certain chromium compounds to be known human carcinogens and (2) nickel and certain nickel compounds to be probable human carcinogens. See above subsection on "Health Effects/Signs and Symptoms" for more information on the carcinogenicity of chromium, nickel, and their compounds.

------------------------FIRST AID AND MEDICAL EMERGENCY PROCEDURES------------------------

Eye Contact:
- Not anticipated to pose a significant eye hazard.

Skin Contact:
- Not anticipated to pose a significant skin hazard.

Inhalation:
- Remove from excessive exposure levels unless proper respiratory protection is worn.

Ingestion:
- Not considered an ingestion hazard.
Engineering Controls (Ventilation, etc.):  
Ventilation should be sufficient to maintain exposure levels below the applicable exposure limit.

Work Practices (Handling and Storage, etc.):  
Arc or spark generated when welding or burning on these products could be a source of ignition for combustible or flammable materials.

Eye Protection:  
Not anticipated to pose a significant eye hazard.

Skin Protection:  
Not anticipated to pose a significant skin hazard.

Respiratory Protection:  
When engineering controls are not sufficient to lower exposure levels below the applicable exposure limit, use a NIOSH-approved respirator for dusts and metal fume within the use limits of the respirator.

SPILL, LEAK, AND DISPOSAL INFORMATION

Procedures to Follow if Material is Released or Spilled:  
NA

Waste Disposal Method(s):  
Any excess product can be recycled for further use, disposed in a permitted hazardous waste landfill, or disposed by other methods which are in accordance with local, state, and federal regulations.

ADDITIONAL OR MISCELLANEOUS INFORMATION

When evaluating exposures to chromium or chromium compounds, consideration should be given to the oxidation state (or valence) of the chromium to which employees are being exposed.

Nonmetallic coatings may be applied (often at the customer's request) to the surface of steel products. These are usually classified as protective coatings or lubricants. For Galvalume and Bethalume products, the typical nonmetallic coatings are rust preventive oils, chromate treatment, or phosphate, borax, and stearate soaps. The possible presence of these coatings should be recognized and considered when evaluating potential employee health hazards and exposures during welding or other dust/fume generating activities.

Footnotes:

(1) Concentrations may vary somewhat between batches or lots. Where possible, a concentration range is indicated. Occasionally, however, levels may even fall outside of the usual concentration ranges.

(2) Common names, if applicable, appear in parentheses following the chemical names.

(3) All values, unless otherwise specified, refer to 8-hour time-weighted average concentrations and units are in mg/M³.

(4) As iron oxide fume.

(5) Ceiling value for manganese.
(6) As manganese fume.
(7) As hexavalent chromium compounds.
(8) As nickel metal and insoluble compounds.
(9) As copper fume.
(10) As aluminum welding fumes.
(11) As zinc oxide fume.

Abbreviations:
NA = Not Applicable
NZ = Not Established
UK = Unknown (No applicable information was found).

GT = Greater Than
LT = Less Than

This document has been prepared solely for the intent of compliance with the provisions of Subpart 2 of Part 1910 of Title 29 of the Code of Federal Regulations, paragraph 1910.1200. BETHLEHEM MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTIES OTHERWISE ARISING FROM COURSE OF DEALING OR TRADE.
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: DODP21035A GALVAN REPAIR PAINT  HMIS CODES: H F R P  
PRODUCT CODE: 0080166A

----------------- SECTION I - MANUFACTURER IDENTIFICATION -----------------

MANUFACTURER'S NAME: MOBILE PAINT MANUFACTURING CO. INC. 
ADDRESS: P.O. BOX 717, THEODORE, AL 36582 
EMERGENCY PHONE: 1-800-255-3924 INFORMATION PHONE: (334) 443-6110 
DATE REVISED : 11-22-94 NAME OF PREPARER : 
REASON REVISED : REVISED RESPIRATORY PROTECTION (SECTION VIII)

----------------- SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION -----------------

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<th>HAZARDOUS COMPONENTS</th>
<th>CAS NUMBER</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>OTHER</th>
<th>OCCUPATIONAL EXPOSURE LIMITS</th>
<th>VAPOR PRESSURE</th>
<th>WEIGHT</th>
<th>% Hg @ TEMP</th>
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<td></td>
<td>0.3%</td>
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</tr>
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</table>

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

----------------- SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS -----------------

BOILING RANGE: 300 to 336 Deg F  SPECIFIC GRAVITY (H20=1): 2.1  
VAPOR DENSITY: HEAVIER THAN AIR  EVAPORATION RATE: SLOWER THAN ETHER 
COATING V.O.C.: 4.48 LB/GL (537 G/L) 
SOLUBILITY IN WATER: NEGREGIBLE 
APPEARANCE AND ODOR: TYPICAL PAINT SOLVENT ODOR

----------------- SECTION IV - FIRE AND EXPLOSION HAZARD DATA -----------------

FLASH POINT: 100-109 F  METHOD USED: SETAPFLASH  
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.3%  UPPER: 10.6%  
EXTINGUISHING MEDIA: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL

SPECIAL FIREFIGHTING PROCEDURES 
DURING EMERGENCY CONDITIONS OVEREXPOSURE TO DECOMPOSITION PRODUCTS MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION. KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, SPARKS, AND OPEN FLAME.

UNUSUAL FIRE AND EXPLOSION HAZARDS 
CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. APPLICATION TO HOT SURFACES REQUIRES SPECIAL PRECAUTIONS. A-33 
FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED. WATER SPRAY MIGHT BE INEFFECTIVE. IF WATER IS USED, FOAM NOZZLES ARE PREFERABLE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP.
SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
HYDROGEN WILL EVOLVE WHEN IN CONTACT WITH WATER OR DRY AIR.

INCOMPATIBILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH ACIDS, ALKALIS, AND WATER.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
NONE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
TIGHTNESS OF CHEST, METALLIC TASTE, COUGH, DIZZINESS, FEVER, CHILLS, HEADACHE, NACRE, AND DRY THROAT. MAY PRODUCE SYMPTOMS KNOWN AS METAL FUMES FEVER OR INOC SHAKES, AN ACUTE SELF-LIMITING CONDITION WITHOUT RECOGNIZED COMPLICATIONS.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
LIKE ANY FINELY DIVIDED PARTICULATE MATTER, THIS MATERIAL MAY CAUSE MECHANICAL IRRITATION TO SKIN AND EYES.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

HEALTH HAZARDS (ACUTE AND CHRONIC)

CARCINOGENICITY: NTP? NO IARC MONOGRAPHS? NO OSHA REGULATED? NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
INOC VAPOR MAY BE AN IRRITANT TO PRE-EXISTING RESPIRATORY CONDITIONS.

EMERGENCY AND FIRST AID PROCEDURES
SYMPTOMS RESULTING FROM INHALATION OVEREXPOSURE USUALLY DISAPPEAR WITHIN 24 HOURS. SYMPTOMATIC TREATMENT, SUCH AS BED REST, POSSIBLY ASPIRIN, TO AFFORD RELIEF FROM FEVER AND CHILL.
EYE CONTACT - FLUSH EYES WITH COPIUS AMOUNTS OF WATER. IN ALL CASES, CONSULT PHYSICIAN FOR MEDICAL ATTENTION.
SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
PROHIBIT SMOKING, AVOID ALL IGNITION SOURCES, AND AVOID DUSTING. MATERIAL SHOULD BE CONTAINED FOR RECYCLING.

WASTE DISPOSAL METHOD
CONTAIN IN A DRY CLOSED CONTAINER. MATERIAL MAY BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE IN A COOL, DRY, WELL-VENTILATED SPACE, SEPARATE FROM ACIDS AND ALKALIES. PROTECT FROM PHYSICAL DAMAGE.

OTHER PRECAUTIONS
PRACTICE GOOD PERSONAL HYGIENE WHEN WORKING IN AREAS WHERE THIS MATERIAL IS USED. KEEP AREAS WHERE ZINC DUST IS USED AND/OR STORED FREE FROM ALL IGNITION SOURCES.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION
USE NIOSH/MSHA APPROVED TYPE RESPIRATOR FOR DUSTING CONDITIONS OR IN THE PRESENCE OF ZINC VAPOR.

VENTILATION
LOCAL EXPLOSION-PROOF EXHAUST VENTILATION TO REDUCE DUST CONCENTRATIONS TO LESS THAN PERMISSIBLE EXPOSURE LIMITS.

PROTECTIVE GLOVES
RECOMMENDED TO PREVENT SKIN IRRITATION IN HYPERSENSITIVE INDIVIDUALS.

EYE PROTECTION
USE SAFETY EYEWEAR FOR PROTECTION AGAINST AIRBORNE PARTICULATE MATTER.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
BARRIER CLEANS MAY HELP PREVENT SKIN IRRITATION IN HYPERSENSITIVE INDIVIDUALS. FIRE RESISTANT COVERALLS ARE RECOMMENDED.

WORK/HYGIENIC PRACTICES
PRACTICE GOOD PERSONAL HYGIENE WHEN WORKING IN AREAS WHERE THIS MATERIAL IS USED.

SECTION IX - DISCLAIMER

DISCLAIMER
THE INFORMATION PROVIDED IN THIS MSDS HAS BEEN OBTAINED FROM SOURCES BELIEVED TO BE ACCURATE AND RELIABLE. IT IS FURNISHED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. RECIPIENTS SHOULD DETERMINE THAT THE INFORMATION IS CURRENT AND SUITABLE FOR THE PROTECTION OF THE ENVIRONMENT AND THE HEALTH AND SAFETY OF YOUR EMPLOYEES AND USERS OF THIS PRODUCT.
MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS, AND RELATED MATERIALS

Manufacturer's Name: Masters Choice, Inc.
1700 Washington Street
Jamestown, NY 14701

Emergency Telephone No.
(412) 628-9100 work hours
(412) 628-8093 after 5 p.m.
(716) 487-0007

Information Telephone No.
(716) 487-0007

Date of Preparation: 9/1/92

Section I — Product Identification
Product Number: MC-510
Product Class: AQUEOUS ACRYLIC/URETHANE

Product Name: METAL REROOF

Section II — Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Percent</th>
<th>Occupational Exposure Limits</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol monobutyl ether</td>
<td>111-76-2</td>
<td>0.9%</td>
<td>25 ppm</td>
<td>0.6 mmhg @ 20 deg. C.</td>
</tr>
<tr>
<td>2, 2, 4 - Trimethyl-1, 3 Pentanediol monoisobutyrate</td>
<td>25265-77-4</td>
<td>0.09%</td>
<td>NONE</td>
<td>1 mmgh @ 87 deg C.</td>
</tr>
</tbody>
</table>

Section III — Physical Data

Boiling Range: Approx. 250 deg. F.
Vapor Density: Heavier Than Air
Evaporation Rate: Slower Than Ether
% Volatile Volume: 67.5%
Weight Per Gallon: 10.17 lbs./gal.

Section IV — Fire & Explosion Hazard Data

Flammability Classification
OSHA: N/A
DOT: NOT REGULATED
LEL: N/A

Extinguishing Media:
Foam ... (XX) "Alcohol" Foam ...( ) CO2 ... (XX)
Dry Chemical ... (XX) Water Fog ... (XX) Other ...( )
Section V — Health Hazard Data

Effects of Overexposure:
INHALATION — Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
SKIN CONTACT — Irritating to skin upon repeated or prolonged contact.
EYE CONTACT — Slightly irritating to eyes.

Emergency & First Aid Procedures:
INHALATION — Move subject to fresh air.
EYE & SKIN CONTACT — Flush eyes for a minimum of 15 minutes with running water. Wash skin thoroughly with soap and water. Consult a physician.

Section VI — Reactivity Data

Stability: Stable
Conditions to Avoid: Keep from heat or flame.
Hazardous Decomposition Products: N/A.
Varied Polymerization: Will Not Occur.
Incompatibility (Materials to Avoid): Product may coagulate or flocculate if mixed with highly ionic solutions or organic solvents.

Section VII — Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Dike and contain spill with inert material (sand, earth, fuller's earth, etc.) and transfer liquid and solid diking material to separate containers for recovery or disposal. Remove contaminated clothing and wash affected skin areas with water. Wash clothing before reuse. Keep spill out of all sewers and open bodies of water.
Waste Disposal Method: Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatant liquid and flush to a chemical sewer. Landfill or incinerate the solids and the contaminated diking material according to local, state, and federal regulations.

Section VIII - Safe Handling and Use Information

Ventilation Type: Mechanical local exhaust ventilation at point of contaminant release.
Respiratory Protection: None required if good ventilation is maintained. Otherwise, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH-approved or equivalent)
Protective Gloves: Chemical resistant rubber or plastic preferred.
Eye Protection: Chemical splash goggles (ANSI Z-87.1 or approved equivalent).
Other Protective Equipment: Impermeable apron to keep material off clothing.

Section IX — Special Precautions

Storage Temperature: Max 49°C /120°F, Min. 1°C /34°F
Precautionary Labeling: KEEP FROM FREEZING — PRODUCT MAY COAGULATE.
NOTE: Monomer vapors can be evolved when product is heated during processing operation. In such a case, use local exhaust ventilation with a minimum capture velocity of 100 ft. /min. (30m /min.) at the point of monomer evolution. Refer to Industrial Ventilation: a Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists.
Other Precautions: The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with Masters Choice, Inc. or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable for their circumstances. This product should not be swallowed or allowed to come in contact with eyes.

HMIS RATING

| HEALTH   | 1 |
| FLAMMABILITY | 1 |
| REACTIVITY  | 0 |
| PERSONAL PROTECTION | E |

VOC
Less than 250 g/l
SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>PAINTS, PRESERVATIVES &amp; SOLVENTS</th>
<th>% TLV (Units)</th>
<th>ALLOTS AND METALLIC COATINGS</th>
<th>% TLV (Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIGMENTS</td>
<td></td>
<td>BASE METAL</td>
<td></td>
</tr>
<tr>
<td>CATALYST</td>
<td></td>
<td>ALLOYS</td>
<td></td>
</tr>
<tr>
<td>VEHICLE</td>
<td></td>
<td>METALLIC COATINGS</td>
<td></td>
</tr>
<tr>
<td>SOLVENTS</td>
<td>Methylene Chloride</td>
<td>100 ppm</td>
<td>FILLER METAL PLUS COATING OR CORE FLUX</td>
</tr>
<tr>
<td>ADDITIVES</td>
<td></td>
<td>OTHERS</td>
<td></td>
</tr>
<tr>
<td>OTHERS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES | % TLV (Units) |

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>Boiling Point (°C)</th>
<th>39.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.32</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg.)</td>
<td>75.2</td>
</tr>
<tr>
<td>Percent Volatile by Volume (%)</td>
<td>100</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>2.93</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Moderate</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, ether-like</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Flash Point (Method used)</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable Limits (Lel, Uel)</td>
<td></td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA Foam, Carbon Dioxide, Dry Chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained respiratory protection should be provided for firemen fighting fires in buildings where Methylene Chloride is stored.

UNUSUAL FIRE AND EXPLOSION HAZARDS: At high temperatures, Methylene Chloride can decompose off Hydrogen Chloride gas & Phosgene.
SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
200 ppm by volume in air

EFFECTS OF OVEREXPOSURE
Headache, mental confusion, depression, fatigue, loss of appetite, nausea, vomiting, cough, loss of sense of balance and visual disturbances.

EMERGENCY AND FIRST AID PROCEDURES
Remove patient immediately from the contaminated area. Obtain medical assistance ASAP. Wash thoroughly with water any body areas contaminated with Methylene Chloride.

SECTION VI REACTIVITY DATA

STABILITY UNSTABLE

CONDITIONS TO AVOID
Open flames, electrical arc.

STABLE

INCOMPATABILITY (Materials to avoid)
Aluminum, titanium, pure oxygen and alkali metals.

RISK OF COMBUSTIBILITY OR EXPLOSION

AZARDOUS DECOMPOSITION PRODUCTS
Hydrogen chloride, phosgene.

AZARDOUS POLYMERIZATION MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN: IN CASE MATERIAL IS RELEASED OR SPILED Spills should be cleaned up immediately. Soak up spills with rags and/or mops.

SITE DISPOSAL METHOD
Be sure all Federal, State and local regulations regarding health and pollution are followed.

SECTION VIII SPECIAL PROTECTION INFORMATION

ESPIRATORY PROTECTION (Specify type) Self-contained breathing apparatus.

ENTILATION LOCAL EXHAUST
SATISFACTORY FOR USE UNDER NORMAL CONDITIONS SPECIAL

MECHANICAL (General) OTHER

OTECTIVE GLOVES Neoprene EYE PROTECTION Safety goggles

HER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

RECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Do not store in pits, depressions and basements or in unventilated areas.

HER PRECAUTIONS
## SECTION V - HEALTH HAZARD DATA

**PRIMARY ROUTES OF ENTRY:**
- Inhalation
- Skin Contact
- Eye Contact
- Ingestion

### EFFECT OF OVEREXPOSURE

**ACUTE:** Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages. Skin Contact: Skin irritant. Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact. Skin Absorption: Prolonged or widespread exposure may result in the absorption of harmful amounts of material. Eye Contact: Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid. Vapors slightly uncomfortable. Inhalation: Moderately toxic. May cause nausea, vomiting, diarrhea. May cause mental slowness.

**CHRONIC:** Symptoms of respiratory tract irritation and damage to respiratory epithelium were reported at rates above 8000 ppm THF for 90 days. Elevation of SGPT suggests a disturbance in liver function. The NOEL was reported to be 200 ppm.

### MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
- Individuals with pre-existing diseases of the eyes, skin or respiratory system may have increased susceptibility to the toxicity of excessive exposure.

### EMERGENCY AND FIRST AID PROCEDURES

- **Inhalation:** If overcome by vapors, remove to fresh air and if breathing stopped, give artificial respiration—preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call physician.
- **Eye Contact:** Flush eyes with plenty of water for 15 minutes and call a physician.
- **Skin Contact:** Remove contaminated clothing and shoes. Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
- **Ingestion:** Give 1 or 2 glasses of water or milk. Do not induce vomiting. Call physician or poison control center immediately.

## SECTION VI - REACTIVITY

### STABILITY
- **UNSTABLE**
- **STABLE**

### CONDITIONS TO AVOID
- Keep away from heat, sparks, open flame and other sources of ignition.

### INCOMPATIBILITY
- (MATERIALS TO AVOID) Cautions, ammonia, inorganics acids, chlorinated compounds, strong oxidizers and fuels.

### HAZARDOUS DECOMPOSITION PRODUCTS
When forced to burn, this product gives off carbon monoxide, carbon dioxide, hydrogen chloride and smoke.

### HAZARDOUS POLYMERIZATION
- MAY OCCUR
- WILL NOT OCCUR
- CONDITIONS TO AVOID
- Keep away from heat, sparks, open flame and other sources of ignition.

## SECTION VII - SPILL OR LEAK PROCEDURES

### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
- Eliminate all ignition sources. Avoid breathing of vapors. Keep liquid out of eyes. Flush with large amount of water. Contain liquid with sand or earth. Absorb with sand or nonflammable absorbent material and transfer to steel drums for recovery or disposal. Prevent liquid from entering drains.

### WASTE DISPOSAL METHOD
- Follow local, State and Federal regulations. Consult disposal expert. Can be disposed of by incineration. Excessive quantities should not be permitted to enter drains. Empty containers should be air dried before disposal. Hazardous Waste Code: 214.

## SECTION VIII - SPECIAL PROTECTION INFORMATION

### RESPIRATORY PROTECTION (Specify type)
- Atmospheric levels should be maintained below established exposure limits contained in Section II. If airborne concentrations exceed these limits, use of a NIOSH-approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus.

### VENTILATION
- Use only with adequate ventilation. Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits set forth in Section II. Use only explosion proof ventilation equipment.

### PROTECTIVE GLOVES
- PVA coated

### EYE PROTECTION
- Splashproof chemical goggles

### OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES
- Impervious apron and a source of running water to flush or wash the eyes and skin in case of contact.

## SECTION IX - SPECIAL PRECAUTIONS

### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
- Store in shade between 40°F - 100°F. Keep away from heat, sparks, open flame and other sources of ignition. Avoid prolonged breathing of vapor. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Train employees on all special handling procedures before they work with this product.

### OTHER PRECAUTIONS
- Follow all precautionary information given on container label, product bulletins and our solvent cementing literature. All handling equipment should be electrically grounded.

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The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

Prepared by George Blanch of P3
MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS, AND RELATED MATERIALS

Manufacturer's Name: Masters Choice, Inc.
1700 Washington Street
Jamestown, NY 14701

Emergency Telephone No.: (412) 628-9100 work hours
(412) 628-8093 after 5 p.m.
(716) 487-0007

Date of Preparation: 9/1/92

Information Telephone No. (716) 487-0007

Section I — Product Identification
Product Number: MC-002
Product Class: AQUEOUS ACRYLICURETHANE
Product Name: PATCHWORKS

Section II — Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Percent</th>
<th>Occupational Exposure Limits</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol monobutyl ether</td>
<td>111-76-2</td>
<td>0.48%</td>
<td>25 ppm</td>
<td>0.6 mmhg @ 20 deg. C.</td>
</tr>
<tr>
<td>2, 2, 4 - Trimethyl-1, 3 Pentanediol monoisobutyrate</td>
<td>25265-77-4</td>
<td>0.06%</td>
<td>NONE</td>
<td>1 mmgh @ 87 deg. C.</td>
</tr>
</tbody>
</table>

Section III — Physical Data
Boiling Range: Approx. 250 deg. F.
Vapor Density: Heavier Than Air
Evaporation Rate: Slower Than Ether
% Volatile Volume: 48.0%
Weight Per Gallon: 10.85 lbs/gal.

Section IV — Fire & Explosion Hazard Data
Flammability Classification: OSHA: N/A
DOT: NOT REGULATED
Flash Point: NON COMBUSTIBLE
LEL: N/A

Extinguishing Media: Foam ...(XX)  "Alcohol" Foam ...( )
Dry Chemical ...(XX)  Water Fog ...(XX)
CO2 ...(XX)  Other ...( )
Section V — Health Hazard Data

Effects of Overexposure:
INHALATION — Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
SKIN CONTACT — Irritating to skin upon repeated or prolonged contact.
EYE CONTACT — Slightly irritating to eyes.

Emergency & First Aid Procedures:
INHALATION — Move subject to fresh air.
EYE & SKIN CONTACT — Flush eyes for a minimum of 15 minutes with running water. Wash skin thoroughly with soap and water. Consult a physician.

Section VI — Reactivity Data

Stability: Stable
Conditions to Avoid: Keep from heat or flame.
Hazardous Decomposition Products: N/A.
Hazardous Polymerization: Will Not Occur.
Compatibility (Materials to Avoid): Product may coagulate or flocculate if mixed with highly ionic solutions or organic solvents.

Section VII — Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Dike and contain spill with inert material (sand, earth, fuller’s earth, etc.) and transfer liquid and solid diking material to separate containers for recovery or disposal. Remove contaminated clothing and wash affected skin areas with water. Wash clothing before reuse. Keep spill out of all sewers and open bodies of water.

Waste Disposal Method: Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatant and flush to a chemical sewer. Landfill or incinerate the solids and the contaminated diking material according to local, state, and federal regulations.

Section VIII — Safe Handling and Use Information

Ion Type: Mechanical local exhaust ventilation at point of contaminant release.
Respiratory Protection: None required if good ventilation is maintained. Otherwise, wear self-contained breathing apparatus (pressurized demand, MSHA/NIOSH-approved or equivalent).
Protective Gloves: Chemical resistant rubber or plastic preferred.
Eye Protection: Chemical splash goggles (ANSI Z-87.1 or approved equivalent).
Other Protective Equipment: Impermeable apron to keep material off clothing.

Section IX — Special Precautions

Storage Temperature: Max 49°C / 120°F, Min. 1°C / 34°F
Precautionary Labeling: KEEP FROM FREEZING — PRODUCT MAY COAGULATE.
NOTE: Monomer vapors can be evolved when product is heated during processing operation. In such a case, use local exhaust ventilation with a minimum capture velocity of 100 ft./min. (30 m/min.) at the point of monomer evolution. Refer to Industrial Ventila-
Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists.

Precautions: The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with Master's Choice, Inc. or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable for their circumstances. This product should not be swallowed or allowed to come in contact with eyes.

<table>
<thead>
<tr>
<th>HMIS RATING</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>Less than 250 g/l</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td></td>
</tr>
<tr>
<td>REACTIVITY</td>
<td></td>
</tr>
<tr>
<td>PERSONAL PROTECTION</td>
<td></td>
</tr>
</tbody>
</table>
MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS, AND RELATED MATERIALS

Manufacturer's Name: Masters Choice, Inc.
1700 Washington Street
Jamestown, NY 14701

Emergency Telephone No.
(412) 628-9100 work hours
(412) 628-8093 after 5 p.m.
(716) 487-0007

Date of Preparation: 9/1/92

Information Telephone No.
(716) 487-0007

Section I — Product Identification
Product Number: MC-004
Product Class: AQUEOUS ACRYLIC/URETHANE
Product Name: PRIMER/SEALER

Section II — Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Percent</th>
<th>Occupational Exposure Limits</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>HAZARDOUS</td>
<td>INGREDIENTS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section III — Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Range</td>
<td>Approx. 212 deg. F.</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Heavier Than Air</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Slower Than Ether</td>
</tr>
<tr>
<td>% Volatile Volume</td>
<td>78%</td>
</tr>
<tr>
<td>Weight Per Gallon</td>
<td>8.71 lbs/gal.</td>
</tr>
</tbody>
</table>

Section IV — Fire & Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>OSHA: N/A</td>
</tr>
<tr>
<td>Classification</td>
<td>DOT: NOT REGULATED</td>
</tr>
<tr>
<td>Flash Point</td>
<td>NON COMBUSTIBLE</td>
</tr>
<tr>
<td>LEL</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Extinguishing Media: N/A

UNUSUAL FIRE & EXPLOSION HAZARDS: This product will not burn, but may spatter if the temperature exceeds the boiling point. Polymer film is capable of burning, giving off oxides, carbon and nitrogen.

SPECIAL FIRE FIGHTING PROCEDURES: N/
Section V — Health Hazard Data

Effects of Overexposure:
INHALATION — Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
SKIN CONTACT — Irritating to skin upon repeated or prolonged contact.
EYE CONTACT — Slightly irritating to eyes.

Emergency & First Aid Procedures:
INHALATION — Move to fresh air.
EYE & SKIN CONTACT — Flush eyes for a minimum of 15 minutes with running water. Wash skin thoroughly
soap and water. Consult a physician.

Section VI — Reactivity Data

Stability: Stable
Conditions to Avoid: Keep from heat or flame.
Hazardous Decomposition Products: N/A.
Polymerization: Will Not Occur.
Incompatibility (Materials to Avoid): Product may coagulate or flocculate if mixed with highly ionic solutions
or organic solvents.

Section VII — Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Dike and contain spill with inert material (sand, earth, fuller's earth, etc.)
and transfer liquid and solid diking material to separate containers for recovery or disposal. Remove contaminated clothing and wash
affected skin areas with water. Wash clothing before reuse. Keep spill out of all sewers and open bodies of water.
Waste Disposal Method: Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatant
liquid and flush to a chemical sewer. Landfill or incinerate the solids and the contaminated diking material according to local, state, and
federal regulations.

Section VIII — Safe Handling and Use Information

Precautionary Labeling: KEEP FROM FREEZING — PRODUCT MAY COAGULATE.
Respiratory Protection: None required if good ventilation is maintained. Otherwise, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH-approved or equivalent).
Protective Gloves: Chemical resistant rubber or plastic preferred.
Eye Protection: Chemical splash goggles (ANSI Z-87.1 or approved equivalent).
Other Protective Equipment: Impermeable apron to keep material off clothing.

Section IX — Special Precautions

Storage Temperature: Max 49C / 120F, Min. 1C / 34F
Precautionary Labeling: KEEP FROM FREEZING — PRODUCT MAY COAGULATE.
Note: Monomer vapors can be evolved when product is heated during processing operation. In such a case, use local exhaust
ventilation with a minimum capture velocity of 100 ft. / min. (30 m / min.) at the point of monomer evolution. Refer to IndustrialVent.
Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists.
Precautions: The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with
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<table>
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<tr>
<th>HMIS RATING</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>1</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>1</td>
</tr>
<tr>
<td>REACTIVITY</td>
<td>0</td>
</tr>
<tr>
<td>PERSONAL PROTECTION</td>
<td>E</td>
</tr>
</tbody>
</table>

Less than 250 g/l
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(716) 487-0007

Information Telephone No.
(716) 487-0007

Date of Preparation: 9/1/92

Section I — Product Identification
Product Number: MC-512
Product Class: AQUEOUS ACRYLIC/URETHANE
Product Name: PROFESSIONAL RUBBER REROOF

Section II — Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Percent</th>
<th>Occupational Exposure Limits</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene Glycol monobutyl ether</td>
<td>111-76-2</td>
<td>0.9%</td>
<td>25 ppm</td>
<td>0.6 mmhg @ 20 deg. C.</td>
</tr>
<tr>
<td>2, 2, 4 - Trimethyl-1, 3 Pentanediol monoisobutyrate</td>
<td>25265-77-4</td>
<td>0.09%</td>
<td>NONE</td>
<td>1 mmgh @ 87 deg C.</td>
</tr>
</tbody>
</table>

Section III — Physical Data

Boiling Range: Approx. 250deg. F.
Vapor Density: Heavier Than Air
Evaporation Rate: Slower Than Ether
% Volatile Volume: 67.5%
Weight Per Gallon: 10.17lbs/gal.

Section IV — Fire & Explosion Hazard Data

Flammability Classification: OSHA: N/A
Flash Point: NON COMBUSTIBLE
LEL: N/A
Extinguishing Media:
- Foam ...(XX)
- "Alcohol" Foam ...( )
- CO2 ...(XX)
- Dry Chemical ...(XX)
- Water Fog ...(XX)
- Other ...( )
Section V — Health Hazard Data

Effects of Overexposure:
INHALATION — Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
SKIN CONTACT — Irritating to skin upon repeated or prolonged contact.
EYE CONTACT — Slightly irritating to eyes.

Emergency & First Aid Procedures:
INHALATION — Move subject to fresh air.
EYE & SKIN CONTACT — Flush eyes for a minimum of 15 minutes with running water. Wash skin thoroughly with soap and water. Consult a physician.

Section VI — Reactivity Data

Stability: Stable
Conditions to Avoid: Keep from heat or flame.
Hazardous Decomposition Products: N/A.
Hazardous Polymerization: Will Not Occur.
Incompatibility (Materials to Avoid): Product may coagulate or flocculate if mixed with highly ionic solutions or organic solvents.

Section VII — Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled: Dike and contain spill with inert material (sand, earth, fuller's earth, etc.). Avoid transfer liquid and solid diking material to separate containers for recovery or disposal. Remove contaminated clothing and wash affected skin areas with water. Wash clothing before reuse. Keep spill out of all sewers and open bodies of water.

Waste Disposal Method: Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatant fluid and flush to a chemical sewer. Landfill or incinerate the solids and the contaminated diking material according to local, state, and federal regulations.

Section VIII — Safe Handling and Use Information

Ventilation Type: Mechanical local exhaust ventilation at point of contaminant release.
Respiratory Protection: None required if good ventilation is maintained. Otherwise, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH-approved or equivalent).
Protective Gloves: Chemical resistant rubber or plastic preferred.
Eye Protection: Chemical splash goggles (ANSI Z-87.1 or approved equivalent).
Other Protective Equipment: Impermeable apron to keep material off clothing.

Section IX — Special Precautions

Storage Temperature: Max 49°C / 120°F, Min. 1°C / 34°F
Precautionary Labeling: KEEP FROM FREEZING — PRODUCT MAY COAGULATE.
IOTC: Monomer vapors can be evolved when product is heated during processing operation. In such a case, use local exhaust ventilation with a minimum capture velocity of 100 ft./min. (30 cm/min.) at the point of monomer evolution. Refer to Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists.

Other Precautions: The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with Masters Choice, Inc. or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This product should not be swallowed or allowed to come in contact with eyes.

<table>
<thead>
<tr>
<th>HMIS RATING</th>
<th>VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>1</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>1</td>
</tr>
<tr>
<td>REACTIVITY</td>
<td>0</td>
</tr>
<tr>
<td>PERSONAL PROTECTION</td>
<td>E</td>
</tr>
</tbody>
</table>

Less than 250 g/l
Section V — Health Hazard Data

Effects of Overexposure:

INHALATION — Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
SKIN CONTACT — Irritating to skin upon repeated or prolonged contact.
EYE CONTACT — Slightly irritating to eyes.

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EYE & SKIN CONTACT — Flush eyes for a minimum of 15 minutes with running water. Wash skin thoroughly with soap and water. Consult a physician.

Section VI — Reactivity Data

Stability: Stable
Conditions to Avoid: Keep from heat or flame.
Dangerous Decomposition Products: N/A.
Hazardous Polymerization: Will Not Occur.
Incompatibility (Materials to Avoid): Product may coagulate or flocculate if mixed with highly ionic solutions or organic solvents.

Section VII — Spill or Leak Procedures

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NOTE: Monomer vapors can be evolved when product is heated during processing operation. In such a case, use local exhaust ventilation with a minimum capture velocity of 100 ft./min. (30 m/min.) at the point of monomer evolution. Refer to Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists.
Other Precautions: The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with the user's Choice, Inc. or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This product should not be swallowed or allowed to come in contact with eyes.

<table>
<thead>
<tr>
<th>HMIS RATING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>1</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>1</td>
</tr>
<tr>
<td>REACTIVITY</td>
<td>0</td>
</tr>
<tr>
<td>PERSONAL PROTECTION</td>
<td>E</td>
</tr>
</tbody>
</table>

VOC
Less than 250 g/l
MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS, AND RELATED MATERIALS

Manufacturer's Name: Masters Choice, Inc.
200 Harrison Street
Jamestown, NY 14702

Date of Preparation: 9/1/92

Emergency Telephone No.
(412) 628-9100 work hours
(412) 628-8093 after 5 p.m.
(716) 487-0007

Section I — Product Identification
Product Number: MC-002
Product Class: AQUEOUS ACRYLIC/URETHANE

Section II — Hazardous Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>Percent</th>
<th>Occupational Exposure Limits</th>
<th>Vapor Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene Glycol monobutyl ether</td>
<td>111-76-2</td>
<td>10.4%</td>
<td>25 ppm</td>
<td>0.6 mmhg @ 20 deg. C.</td>
</tr>
</tbody>
</table>

Section III — Physical Data

Boiling Range: Approx. 250deg. F.
Vapor Density: Heavier Than Air
Evaporation Rate: Slower Than Ether
% Volatile Volume: 60%
Weight Per Gallon: 11.00 lbs/gal.

Section IV — Fire & Explosion Hazard Data

Flammability
OSHA: N/A
DOT: NOT REGULATED

Classification
Flash Point: NON COMBUSTIBLE
LEL: N/A

Extinguishing Media:
Foam . . . (XX)
"Alcohol" Foam . . . ( )
Dry Chemical . . . (XX)
Water Fog . . . (XX)
CO2 . . . (XX)
Other . . . ( )
SECTION I

Manufacturer's Name
OREGON RESEARCH & DEVELOPMENT CORPORATION
Address (Number, Street, City, State, and ZIP Code)
1895 16TH STREET S.E., SALEM, OREGON 97302-1436

Emergency Telephone Number
911 - ASK FOR POISON CONTROL CENTER
Telephone Number for Information
1-800-345-0809
Date Prepared
JULY 10, 1991, UPDATED MAY 1994
Signature of Preparer (optional)

SECTION II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))
- Pigments
- Sophisticated Acrylic Latex
- Solvents (Water)
- Misc. inert ingredients

Less than ¼ of 1%; pH is less than 10
Contains no VOC's

ALL MATERIALS ARE WITHIN ESTABLISHED EPA LIMITS

SECTION III — Physical/Chemical Characteristics

Boiling Point
212°F
Specific Gravity (H.O = 1)
1.15 n/1

Vapor Pressure (in mm Hg)
1.75 mm Hg
Melting Point
N.A.

Vapor Density (Air = 1)
N.A.
Evaporation Rate
Butyl Nitrite = 1
0.83-1.0

Solubility in Water
Dilutable
Appearance and Odor
Thick, creamy, white liquid; Slight ammonia odor

SECTION IV — Fire and Explosion Hazard Data

Flash Point (Method Used)
N.A.
Flammability
N.A.

Extinguishing Media
N.A.

Special Fire Fighting Procedures
N.A.

Unusual Fire and Explosion Hazards
N.A.
SECTION V — Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>Unstable</th>
<th>Stable</th>
<th>Conditions to Avoid</th>
<th>None</th>
</tr>
</thead>
</table>

Incompatibility (Materials to Avoid)

Hazardous Decomposition or Byproducts

Thermal decomposition may produce carbon monoxide and/or carbon dioxide.

Hazardous Polymerization

May Occur | Conditions to Avoid | None

Will Not Occur | X

SECTION VI — Health Hazard Data

Route(s) of Entry:

<table>
<thead>
<tr>
<th>Inhalation?</th>
<th>Skin?</th>
<th>Ingestion?</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Emergency and First Aid Procedures.</td>
<td>N.A.</td>
<td></td>
</tr>
</tbody>
</table>

Health Hazards (Acute and Chronic)

N.A.

Carcinogenicity:

<table>
<thead>
<tr>
<th>N.O.</th>
<th>N.A.</th>
<th>IARC Monographs?</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
<td>OSHA Regulated?</td>
<td>No</td>
</tr>
</tbody>
</table>

Signs and Symptoms of Exposure

N.A.

Medical Conditions Generally Aggravated by Exposure

Contains some ammonia for pH control. Mist or liquid may irritate or burn eyes, skin and mucus membrane.

Emergency and First Aid Procedures

Flush eyes and skin with water for at least 30 minutes if irritation occurs. Remove contaminated clothing. Seek medical attention as needed. Seek ventilation and fresh air as needed.

SECTION VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Since some persons might be skin sensitive, gloves are recommended. Use absorbent material and place in approved container and bury in approved landfill.

Waste Disposal Method

Collect and bury in landfill or wash into sewage treatment plant in small quantities. For large quantities, contact Environmental Protection Agency or this company.

Precautions to Be Taken in Handling and Storage

Best stored between 40° and 80° F. DO NOT FREEZE!

OTHER PRECAUTIONS

N.A.

SECTION VIII — Control Measures

Respiratory Protection (Specify Type)

If sprayed, we recommend respirator filter mask suitable for spray painting. NIOSH approved.

Ventilation

<table>
<thead>
<tr>
<th>Local Exhaust</th>
<th>Mechanical (General)</th>
<th>Acceptable</th>
<th>Special</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide proper ventilation as needed</td>
<td>N.A.</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protective Gloves

Advisable | Eye Protection

Face shield or safety glasses as needed

Protective Clothing or Equipment

Wear protective clothing as needed.

Work Hygienic Practices

An eyewash and safety shower should be nearby and ready for use.

A-50
**TOPCOAT Material Safety Data Sheet**

**IDENTITY** (As Used on Label and List)

<table>
<thead>
<tr>
<th>Manufacturer’s Name</th>
<th>TOPCOAT WOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPCOAT, a division of Major Group Incorporated</td>
<td>Emergency Telephone Number 508-668-4128</td>
</tr>
<tr>
<td>Address (Number, Street, City, State and ZIP Code)</td>
<td>Telephone Number for Information 508-668-4128</td>
</tr>
<tr>
<td>24 Industrial Road</td>
<td>Data Prepared 1/3/96</td>
</tr>
<tr>
<td>Walpole, MA 02081</td>
<td>Signature of Preparer (optional)</td>
</tr>
</tbody>
</table>

**Section II — Hazardous Ingredients / Identity Information**

<table>
<thead>
<tr>
<th>Hazardous Component (Specific Chemical Identity: Common Name(s))</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>Other Limits Recommended</th>
<th>% (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia CAS #1336-21-6</td>
<td>25 ppm</td>
<td>25 ppm</td>
<td>&lt;1*</td>
<td></td>
</tr>
</tbody>
</table>

**HMIS Health Rating:**
- Fire - 0
- Health - 1
- Reactivity - 0
- Personal Protection - G

**Section III — Physical / Chemical Characteristics**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>212°F</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.45</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Density (AIR = 1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation Rate (Water = 1)</td>
<td>1.0</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Dilutable in water</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Thick liquid with ammonia odor</td>
</tr>
</tbody>
</table>

**Section IV — Fire and Explosion Hazard Data**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (Method Used)</td>
<td>&gt;240°F TCC</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>LEL</td>
<td>N/A</td>
</tr>
<tr>
<td>UEL</td>
<td>N/A</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Water spray, CO₂, foam used on the dry film</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Self contained breathing apparatus recommended</td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td>N/A</td>
</tr>
</tbody>
</table>

A-51
Section V — Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstable</td>
<td>N/A</td>
</tr>
<tr>
<td>Stable</td>
<td>X</td>
</tr>
</tbody>
</table>

Incompatibility (Materials to Avoid) N/A

Hazardous Decomposition or Byproducts

<table>
<thead>
<tr>
<th>Hazardous Polymerization</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>May Occur</td>
<td>N/A</td>
</tr>
<tr>
<td>Will Not Occur</td>
<td>X</td>
</tr>
</tbody>
</table>

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? Yes

Inhalation
Vapor or mist can cause headaches, dizziness or nausea. Also irritation of the throat and nose.

Eye Contact
Exposure to vapor can cause irritation to the eyes.

Skin Contact
Exposure can cause irritation or reddening of the skin.

Delayed Effects N/A

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

EXPOSURE LIMIT INFORMATION

<table>
<thead>
<tr>
<th>Component</th>
<th>OSHA</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Units</td>
<td>TWA</td>
</tr>
<tr>
<td>1</td>
<td>ppm</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Not Required</td>
<td></td>
</tr>
</tbody>
</table>

A-52
EMERGENCY RESPONSE INFORMATION

FIRST AID PROCEDURES

Inhalation
Remove individual to an area that has fresh air, if breathing has stopped, apply artificial respiration. Contact physician immediately.

Ingestion
If individual is awake, give water to drink. Call physician immediately.

Eye and Skin Contact
Flush eyes with water for 15 minutes. If irritation persists call physician.
Wash contaminated skin with soap and water.

Note to Physician
N/A

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
Dam up area to prevent spreading. Caution, area will be slippery. Use absorbent material to dry up compound. Provide ventilation in closed areas.

Waste Disposal Method
Dispose of the absorbent material and dry compound according to local, state, and federal regulations.

Precautions to Be Taken in Handling and Storing
Store in a well ventilated area at temperatures between 50°F - 80°F.

Other Precautions
Protect from freezing.

Section VIII — Control Measures

Respiratory Protection (Specify Type)
NIOSH approved organic vapor cartridge type

Ventilation
Local Exhaust
Yes
Special
N/A
Mechanical (General)
Yes
Other
N/A

Protective Gloves
Impervious type
Eye Protection
Safety Glasses

Other Protective Clothing or Equipment
N/A
ABBREVIATIONS

ACGIH = American Conference of Governmental Industrial Hygienists
OSHA = Occupational Safety and Health Administration
TLV = Threshold Limit Value
PEL = Permissible Exposure Limit
TWA = Time Weighted Average
STEL = Short-Term Exposure Limit

The information contained herein relates only to the specific material identified. Major Group Incorporated believes that such information is accurate and reliable as of the date of this material safety data sheet, but no representation, guarantee or warranty, express or implied, is made as to the accuracy, reliability, or completeness of the information. Major Group Incorporated urges persons receiving this information to make their own determination as to the information's suitability and completeness for their particular application.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS NUMBER</th>
<th>CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>#1336-21-6</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>
ENCLOSED IS A DAP MATERIAL SAFETY DATA SHEET(S) THAT COMPLIES WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

IT IS DAP'S POLICY TO LIST AN INGREDIENT ON THE MSDS AND GIVE APPROPRIATE WARNINGS IF IT IS IN THE PRODUCT AT GREATER THAN 1% (OR 0.1% IF A CARCINOGEN), AND IT MEETS ANY ONE OF THE FOLLOWING CRITERIA:

1) IS LISTED IN THE OSHA Z-TABLES WITH AN ESTABLISHED PERMISSIBLE EXPOSURE LIMIT (PEL);
2) THE ACGIH HAS ESTABLISHED A THRESHOLD LIMIT VALUE (TLV OR 8-HOUR TIME WEIGHTED AVERAGE);
3) IS LISTED BY NTP, IARC OR OSHA AS A KNOWN CARCINOGEN;
4) HAS A FLASH POINT BELOW 200 DEGREES F.;
5) MAY UNDERGO HAZARDOUS POLYMERIZATION;
6) IS A STRONG OXIDIZING OR CAUSTIC AGENT;
7) IS LISTED ON THE SARA 313 LIST OF REPORTABLE CHEMICALS.

ABBREVIATIONS USED IN DAP'S MATERIAL SAFETY DATA SHEETS:
ACGIH - AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
IARC - INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
NA - NOT APPLICABLE
NE - NOT ESTABLISHED
PEL - PERMISSIBLE EXPOSURE LIMIT
NTP - NATIONAL TOXICOLOGY PROGRAM
SARA - SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
STEL - SHORT TERM EXPOSURE LIMIT
TLV - THRESHOLD LIMIT VALUE (8-HR TIME WEIGHTED AVERAGE OR TWA)
VOC - VOLATILE ORGANIC COMPOUND
NJRTK - NEW JERSEY RIGHT TO KNOW LAW

PLEASE FILE THIS INFORMATION WITH YOUR PERMANENT RECORDS OF PRODUCT INFORMATION.
SECTION I. MATERIAL IDENTIFICATION

TRADE/MATERIAL NAME: DAP BUTYL GUTTER & LAP SEALANT.

DESCRIPTION: CAULK

CAS: MIXTURE

PREVIOUS MSDS REVISION DATE: MARCH 30, 1992

DOT INFORMATION FOR DOMESTIC GROUND TRANSPORT OF CONTAINERS 300Z. OR LESS:

UN/NF/HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

<table>
<thead>
<tr>
<th>HEALTH HAZARD</th>
<th>FLAMMABILITY HAZARD</th>
<th>REACTIVITY HAZARD</th>
<th>PERSONAL PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - SLIGHT</td>
<td>3 - SERIOUS</td>
<td>0 - MINIMAL</td>
<td>8 - GLASSES, 9 - GLOVES</td>
</tr>
</tbody>
</table>

SECTION II. INGREDIENTS AND HAZARDS

INGREDIENT NAME:       CAS NUMBER:  PERCENT: EXPOSURE LIMITS:

MINERAL SPIRITS         8052-41-3   5-10   OSHA PEL: 100PPM TWA

M"P NAPHTHA             64742-69-8   5-10   OSHA PEL: 500PPM TWA

ACGIH TLV: 1000PPM TWA

REMAINING INGREDIENTS ARE NOT REGULATED BY OSHA AND ARE CONSIDERED TRADE SECRETS.

AS PETROLEUM DISTILLATES

MSDS 10008 CONTINUES ON PAGE 2

PAGE 1
SECTION III. PHYSICAL DATA

APPEARANCE & ODOR: OPAQUE PASTE WITH A PETROLEUM DISTILLATE ODOR

BOILING POINT: 212°F
VAPOR PRESSURE: 30MMHG @ 100°F (VMAP)
VAPOR DENSITY (AIR=1): 1

LATENT HEAT OF VAPORIZATION (X): NEGLIGIBLE

EVAPORATION RATE: (N-BUTYL ACETATE=1): 1
SPECIFIC GRAVITY (H2O=1): 1.46
2 VOLATILE BY VOLUME: 27

VISCOSITY (SLURF): 1.2 PVC @ 123°F FOR 10 MIN.

LC LESS WATER LESS EXEMPT SOLVENT (GRAMS/LITER): 210-215
LC MATERIAL (GRAMS/LITER): 210-215

SECTION IV. FIRE AND EXPLOSION DATA

FLASH POINT (METHOD): (TAG C.C.) SF LIMITS: LEL: NC UEL: NC

EXTinguishing MEDIA: FOAM, CARBON DIOXIDE, DRY CHEMICALS

USUAL FIRE OR EXPLOSION HAZARDS: CONTAINERS MAY EXPLODE IF EXPOSED TO EXTREME HEAT. ELIMINATE SOURCE OF ICHIGATION. HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAMES. DO NOT PUT IN CONTACT WITH OXIDIZING OR CAUSTIC MATERIALS.

SPECIAL FIRE-FIGHTING PROCEDURES: FULL PROTECTIVE EQUIPMENT, INCLUDING SELF-CONTAINED BREATHING APPARATUS. IF RECOMMENDED IF PROTECT FROM COMBUSTION PRODUCTS. IF EXPOSED CONTAINERS WITH WATER.
MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CHEMICAL INCOMPATIBILITIES: STRONG OXIDIZERS AND CAUSTICS

CONDITIONS TO AVOID: EXCESSIVE HEAT AND FREEZING.

HAZARDOUS DECOMPOSITION PRODUCTS: NORMAL COMBUSTION PRODUCTS, I.E. CO2, NOX

SECTION VI. HEALTH HAZARD INFORMATION

THIS PRODUCT IS NOT CONSIDERED A CARCINOGEN BY NTP, IARC AND OSHA.

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY CONTACT: NONE KNOWN

PRIMARY ENTRY ROUTE(S): INHALATION OF SOLVENT VAPORS AND SKIN CONTACT.

ACUTE EFFECTS: MAY IRRITATE EYES, SKIN, NOSE, AND UPPER RESPIRATORY TRACT. HARMFUL IF INHALED. HARMFUL OR FATAL IF SWALLOWED. IF INGESTED THIS PRODUCT MAY CAUSE VOMITING, DIARRHEA, AND DEPRESSED RESPIRATION. INHALATION MAY AFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

CHRONIC EFFECT(S): REPORTS HAVE ASSOCIATED PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE WITH PROLONGED AND REPEATED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS.

HEALTH HAZARD INFORMATION CONTINUES ON PAGE 3

--- PAGE 2
MATERIAL SAFETY DATA SHEET

OAP, INC.
P.O. BOX 277
DAYTON, OH 45401-0277

MSDS NO: DAP / 10006
INTERNAL ID: 10006
DAP BUTYL GUTTER & LAP SEALANT
REVISION: 5
DATE: MAY 19, 1993

FIRST AID:

EYE CONTACT: FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES.
CONTACT A PHYSICIAN IMMEDIATELY.

SKIN CONTACT: WASH IMMEDIATELY WITH SOAP AND WATER.

INHALATION: REMOVE TO FRESH AIR. CONTACT A PHYSICIAN IMMEDIATELY.

INGESTION: DO NOT INDUCE VOMITING. CONTACT A PHYSICIAN OR REGIONAL POISON CONTROL CENTER IMMEDIATELY.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

FILL / LEAK PROCEDURES: USE ABSORBENT MATERIAL OR SCRAPE UP DRIED MATERIAL AND PLACE INTO CONTAINERS.

WASTE MANAGEMENT / DISPOSAL: DISPOSE OF ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS. DISCARDED MATERIAL SHOULD BE INCINERATED AT A PERMITTED FACILITY. DO NOT REUSE EMPTY CONTAINER.

SECTION VIII. SPECIAL PROTECTION INFORMATION

PERSONAL PROTECTIVE EQUIPMENT:

GOGGLES: GOGGLES OR SAFETY GLASSES WITH SIDE SHIELDS

GLOVES: SOLVENT IMPERVIOUS GLOVES

RESPIRATOR: IF 8-HOUR EXPOSURE LIMIT OR VALUE IS EXCEEDED FOR ANY COMPONENT, USE AN APPROVED NIOSH/OSHA RESPIRATOR. CONSULT YOUR SAFETY EQUIPMENT SUPPLIER AND THE OSHA REGULATION, 29 CFR 1910.134 FOR RESPIRATOR REQUIREMENTS.

WORKPLACE CONSIDERATIONS:

VENTILATION: PROVIDE SUFFICIENT MECHANICAL VENTILATION (LOCAL OR GENERAL EXHAUST) TO MAINTAIN EXPOSURE BELOW PEL AND TLV. VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS. CHECK ALL LOW AREAS (BASEMENTS, CLOSETS, ETC.) FOR VAPOR BEFORE ENTERING.

SAFETY STATIONS:

PROVIDE EYE WASH AND SOLVENT IMPERVIOUS APRON OR BODY CONTACT WITH PRODUCT INGREDIENT. BARRIER GLOVES MAY BE USED.

CONTAMINATED EQUIPMENT:

WASH CONTAMINATED CLOTHING BEFORE REUSE.

MISSING CONTINUES ON PAGE 4

--- PAGE 3

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SECTION IX. SPECIAL PRECAUTIONS

STORAGE SEGREGATION: STORE AWAY FROM CAUSTICS AND OXIDIZERS.

SPECIAL HANDLING / STORAGE: KEEP OUT OF REACH OF CHILDREN. KEEP CONTAINERS FROM EXCESSIVE HEAT AND FREEZING. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. DO NOT STORE AT TEMPERATURES ABOVE 120F.

OTHER PRECAUTIONS: INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING VAPORS MAY BE HARMFUL OR FATAL.

DOT CLASS: SEE SECTION I

UN REGISTER: SEE SECTION I
MATERIAL SAFETY DATA SHEET

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. IPS Corporation urges the customers receiving this Material Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents, and contractors of the information on this sheet.

SECTION I

MANUFACTURER'S NAME
IPS Corporation

ADDRESS
17109 S. Main St., P.O. Box 379, Gardena, CA 90248

TRADE NAME
WELD-ON #31214 for PVC

CHEMICAL NAME and FAMILY
Solvent Cement for PVC Plastic
Mixture of PVC Resin and Organic Solvents

FORMULA: Proprietary

SECTION II - HAZARDOUS INGREDIENTS

None of the ingredients below are listed as carcinogens by IARC, NTP or OSHA

<table>
<thead>
<tr>
<th>CAS #</th>
<th>APPROX. %</th>
<th>ACGIH-TLV</th>
<th>ACGIH-STEEL</th>
<th>OSHA-PEL</th>
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<tr>
<td>NONHAZ</td>
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<td>250 PPM</td>
<td>250 PPM</td>
<td>250 PPM</td>
</tr>
<tr>
<td>75-03-3</td>
<td>10-20</td>
<td>200 PPM</td>
<td>300 PPM</td>
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</tr>
<tr>
<td>106-94-1</td>
<td>10-20</td>
<td>25 PPM Skin</td>
<td>25 PPM Skin</td>
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</tbody>
</table>

"Title II Section 313 Supplier Notification: This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40CFR372. This information must be included in all MSDSs that are copied and distributed for this material.

SECTION III - PHYSICAL DATA

APPEARANCE
Clear, heavy syrupy liquid

ODOR
Ether-like

BOILING POINT (F/C)
151°F Based on first boiling component: THF

SPECIFIC GRAVITY @ 73 +/ - 2°F
Typical 0.860 +/- 0.040

VAPOR PRESSURE (mm Hg)
143 mm Hg. Based on first boiling component, THF @ 20°C

VAPOR DENSITY (Air = 1)
2.49

EVAPORATION RATE (B) = 1
Approx. 8 - 8

SOLUBILITY IN WATER
Soluble portion completely soluble in water. Resin portion evaporates out.

VOC STATEMENT: This cement contains 7% grams of VOC per liter as manufactured. More than 90 percent of the VOC falls as a residue cement and remains in the joint.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
6°F T.O.C. Based on THF

FLAMMABLE LIMITS
(Percent by Volume)

LEL | UEL
---|---
11.5 | 11.5

EXTINGUISHING MEDIA
Anhedral "Purple K" potassium bicarbonate dry chemical, carbon dioxide, National Air-O-Foam universal alcohol resistant foam, water spray.

SPECIAL FIRE FIGHTING PROCEDURES
Evacuate enclosed areas, stay upwind. Closed confined quarters require self-contained breathing apparatus, positive pressure hose masks or airline masks. Use water spray to cool containers, attack fire from source of ignition and to disperse vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source of ignition.

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MATERIAL SAFETY DATA SHEETS

III. STORAGE COATINGS
ACRYL 60
THORO SYSTEM PRODUCTS

Section I - General Information

Manufacturer:
Thoro System Products Inc
A Division of
Harris Specialty Chemicals, Inc.
8570 Phillips Highway
Jacksonville, FL 32256-8208

Emergency Phone: Chemtrec 1-800-424-9300

Material Name: ACRYL 60

Section II - Hazardous Ingredients/Identity Information

HAZARDOUS COMPONENTS
(Specific Chemical ID) OSHA PEL ACGIH TLV OTHER LIMITS
ACRYLIC polymer None none RECOMMENDED %
(Non-hazardous, no CAS #)
Ammonia (7664-41-7) 35ppm 25ppm <0.15
Water (7732-18-5) 70 - 6

Section III - Physical/Chemical Characteristics

BOILING POINT: 212 F freezing point: 32 F
VAPOR PRESSURE (mm Hg): 17
VAPOR DENSITY (AIR = 1): heavier
SPECIFIC GRAVITY (H2O=1): 1.02
pH: 9.2 - 10.0
SOLUBILITY IN WATER: dilutable
% Volatile by volume: ca 72%
APPEARANCE AND ODOR: milky white liquid. Water-like consistency.
Slight ammonia odor.

Section IV - Fire and Explosion Hazard Data

FLASH POINT (METHOD USED): NA (Non-combustible)

FLAMMABLE LIMITS: NA

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Section IV - Fire and Explosion Hazard Data (Cont.)

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: A self-contained breathing apparatus and full protective clothing should be worn when fighting fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Acrylic emulsions will not burn. They may splatter if temperature exceeds boiling point (212 F). Dried polymer films are capable of burning.

Section V - Reactivity Data

STABILITY (CHOOSE ONE): ( ) UNSTABLE (X) STABLE

CONDITIONS TO AVOID: NA

INCOMPATIBILITY (MATERIALS TO AVOID): NA

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Thermal decomposition may yield oxides of carbon.

HAZARDOUS (CHOOSE ONE): ( ) MAY OCCUR (X) WILL NOT OCCUR POLYMERIZATION

CONDITIONS TO AVOID: NA

Section VI - Health Hazard Data

ROUTE(S) OF ENTRY: INHALATION? no SKIN? yes INGESTION? yes

HEALTH HAZARDS (ACUTE AND CHRONIC):
General: No toxicity information is available on this specific preparation; this health hazard assessment is based on information that is available on its components.
Ingestion: Relative to other materials, a single dose of this product is practically non-toxic by ingestion. Based on acute toxicity studies for a number of compositionally similar acrylic emulsions the typical oral LD50 (rats): > 5.0g/kg. This product is approved for incorporation into coatings in contact with potable water (U.S. EPA).
Eye Contact: Direct contact with emulsion may irritate human eyes. In studies of compositionally similar acrylic emulsions, rated as inconsequentially irritating to eyes (rabbit).
Skin Contact: Prolonged or repeated contact may irritate human skin. In skin studies (rabbit) compositionally similar acrylic emulsions, rated as practically non-irritating.
Skin Absorption: No systemically toxic effects are known to occur in man via absorption of this material through skin. The LD50 dermal (rabbits) is > 5.0g/kg for compositionally similar acrylic emulsions.
Inhalation: Inhalation of vapor or mist can cause headache, nausea, and may irritate the nose, throat, or lungs. Monomer vapors may be generated if product is heated during processing operations. See section 9.

Other effects of overexposure: No other adverse clinical effects are known to be associated with exposures to this mixture.

**EMERGENCY AND FIRST AID PROCEDURES:**

**Inhalation:**
Remove victim to fresh air. If breathing is difficult administer oxygen. Consult a physician.

**Ingestion:**
Get medical attention

**Eye Contact:**
Flush with water for at least 15 minutes. Obtain medical attention

**Skin Contact:**
Wash with soap. Flush with water for at least 15 minutes

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**
Keep unnecessary people away. Surfaces may be slippery, use caution.

Dike and contain spill with inert material (sand, absorbent, earth, etc.).

Transfer liquid to containers for recovery or disposal. Transfer solid diking/absorbent material to separate containers for disposal. Keep spills and runoff out of sewers and bodies of water.

**WASTE DISPOSAL METHOD:**
Discarded product is a non-hazardous waste under RCRA criteria (40 CFR, Part 261). However, even small amounts of emulsion will discolor bodies of water. Reuse uncontaminated material when possible. Landfill or incinerate solids and contaminated diking material in accordance with local, state and federal regulations.

**Container disposal:** Drain containers completely. Empty containers may retain small amounts of residual product. Observe all hazard precautions when handling empty containers. Puncture or otherwise destroy container and dispose of as non-hazardous waste in accordance with local, state and federal regulations.

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:**
Keep from freezing - product may coagulate. If frozen, thaw at room temperature. If solids are coagulated or "crystallized" product is unusable. Keep out of direct sunlight.

Residual monomer content present no problem under normal conditions of use, however high levels of monomer vapors can be released into work areas when emulsions are heat dried or cured (ovens, infrared lamp, etc.) if good ventilation is not used.
Section VIII - Control Measures

RESPIRATORY PROTECTION (SPECIFY TYPE):
Not required if good ventilation is maintained. Use appropriate
MSHA/NIOSH respirator when dusts or mists are generated for the types
and concentrations of air contaminants encountered.

VENTILATION:

LOCAL EXHAUST: Suggested
MECHANICAL (GENERAL):
SPECIAL:
OTHER:

PROTECTIVE GLOVES:
Rubber or neoprene

EYE PROTECTION:
Safety glasses or chemical splash goggles

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
Long trousers, longsleeved shirt, and appropriate footwear recommended to
avoid skin contact.

WORK/HYGIENIC PRACTICES:
Wash after handling.

Footnote:
This product is formulated for use as an admixture (additive) to cement-
based coatings, plasters, mortars, patching materials, etc., either as
supplied or further diluted with water. Its primary function is to enhance
the chemical and physical characteristics of the material it is added (eg.
adhesion, compressive, tensile and flexurel strengths, chemical resistance,
etc.). Read and follow label directions and technical bulletin number 67 for
this product.
The information herein is given in good faith but no warranty, expressed or
implied, is made.

N/A = Not Available
NA = Not applicable
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: MOPoxy HS-50 WHITE
PRODUCT CODE: 40BW005

HMIS CODES: H F R P 2 3 0

================================= SECTION I - MANUFACTURER IDENTIFICATION ==================================

MANUFACTURER'S NAME: MOBILE PAINT MANUFACTURING CO. INC.
ADDRESS: P.O. BOX 717, THEODORE, AL 36582
EMERGENCY PHONE: 1-800-255-3924
INFORMATION PHONE: (334) 443-6110
DATE REVISED: 11-22-94
NAME OF PREPARER:
REASON REVISED: REVISED RESPIRATORY PROTECTION (SECTION VIII)

================================= SECTION II - HAZARDOUS INGREDIENTS/SARA III INFORMATION =================

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>CAS NUMBER</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
<th>OTHER</th>
<th>VAPOR PRESSURE</th>
<th>WEIGHT</th>
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<tbody>
<tr>
<td>Methyl Isobutyl Ketone</td>
<td>108-10-1</td>
<td>100 PPM</td>
<td>50 PPM</td>
<td>205 MG/KG</td>
<td>26.0</td>
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<td>Xylenene</td>
<td>1330-29-7</td>
<td>100 PPM</td>
<td>100 PPM</td>
<td>435 MG/KG</td>
<td>6.0</td>
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<td>Titanium Dioxide</td>
<td>1344-67-7</td>
<td>10 MG/KG</td>
<td>10 MG/KG</td>
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<td>Silicon Dioxide</td>
<td>14808-50-7</td>
<td>10 MG/KG</td>
<td>10 MG/KG</td>
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<tr>
<td>Barium Sulfate</td>
<td>7727-43-7</td>
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<td>10 MG/KG</td>
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<tr>
<td>Mica</td>
<td>12881-26-2</td>
<td>20 MG/CF</td>
<td>3 MG/KG</td>
<td>N/A</td>
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</table>

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

================================= SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS =================

BOILING RANGE: 237 to 280 Deg F
SPECIFIC GRAVITY (H2O=1): 1.4
VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHYL COATING V.O.C.: 3.11 LB/GL (372 G/L)
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: TYPICAL PAINT SOLVENT ODOR

================================= SECTION IV - FIRE AND EXPLOSION HAZARD DATA =================

FLASH POINT: 73-79 F
METHOD USED: SETAF IASH
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.0% UPPER: 8.0%

EXTINGUISHING MEDIA: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL

SPECIAL FIREFIGHTING PROCEDURES
DURING EMERGENCY CONDITIONS, OVEREXPOSURE TO DECOMPOSITION PRODUCTS MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION. KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, SPARKS, AND OPEN FLAME.

UNUSUAL FIRE AND EXPLOSION HAZARDS
CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. APPLICATION TO HOT SURFACES REQUIRES SPECIAL PRECAUTIONS. FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS SHOULD BE USED. WATER SPRAY MAY BE INEFFECTIVE. IF WATER IS USED, FOAM NOZZLES ARE PREFERABLE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP.
SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
HIGH TEMPERATURES

INCOMPATIBILITY (MATERIALS TO AVOID)
OXIDIZING MATERIALS

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
MAY PRODUCE HAZARDOUS FUMES WHEN HEATED TO DECOMPOSITION AS IN WELDING.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Anesthetic. Excessive inhalation can cause irritation of the respiratory tract, or acute nervous system depression characterized by headache, dizziness, staggering gait, confusion, unconsciousness, coma and even asphyxiation.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
SKIN: MODERATE IRRITATION, DEGRADING, DERMATITIS. MAY BE A SENSITIZER IN SOME INDIVIDUALS.
EYES: SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION. MAY BE A SENSITIZER IN SOME INDIVIDUALS.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:
Liquid can be absorbed through the skin resulting in symptoms similar to the inhalation effects above.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA. ASPIRATION INTO THE LUNGS DURING INGESTION OR VOMITING MAY CAUSE MILD TO SEVERE PULMONARY INJURY AND POSSIBLY EVEN DEATH.

HEALTH HAZARDS (ACUTE AND CHRONIC)
REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

CARCINOGENICITY: NTP? NO  IARC MONOGRAPHS? NO  OSHA REGULATED? NO

MEDICAL CONDITIONS GENERALLY AGgravated BY EXPOSURE
EXPOSURE TO PETROLEUM SOLVENTS MAY AGGRAVATE PREEXISTING DERMATITIS.

EMERGENCY AND FIRST AID PROCEDURES
INHALATION: REMOVE TO FRESH AIR. ADMINISTER OXYGEN IF BREATHING IS DIFFICULT. RESTORE BREATHING IF NECESSARY. TREAT SYMPTOMATICALLY. CONSULT A PHYSICIAN.
SKIN: WASH AFFECTED AREAS WITH SOAP AND WATER. REMOVE AND LAUNDER CONTAMINATED CLOTHING; CONSULT A PHYSICIAN IF NEEDED.
EYES: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. TAKE TO A PHYSICIAN FOR MEDICAL TREATMENT.
INGESTION: DRINK 1 OR 2 GLASSES OF WATER TO DILUTE. DO NOT INDUCE VOMITING. GET MEDICAL HELP IMMEDIATELY.
SECTIONS VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
REMOVE ALL SOURCES OF IGNITION (FLAME, HOT SURFACES, AND ELECTRICAL, STATIC, OR FRICIONAL SPARK). AVOID BREATHING VAPORS. VENTILATE AREA, CONTAIN AND REMOVE WITH INERT ABSORBENT AND NON-SPARING TOOLS.

WASTE DISPOSAL METHOD
DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
DO NOT STORE ABOVE 120°F. STORE LARGE QUANTITIES ONLY IN BUILDINGS DESIGNED TO COMPLY WITH OSHA 1910.106. KEEP CLOSURES TIGHT AND CONTAINER UPRIGHT TO PREVENT LEAKAGE. DO NOT STORE OR USE NEAR HEAT, SPARKS OR FLAME. NEVER USE PRESSURE TO EMPTY. DRUM MUST NOT BE WASHED OUT OR USED FOR OTHER PURPOSES. DRUMS OF THIS MATERIAL SHOULD BE GROUNDED WHEN FILLING.

OTHER PRECAUTIONS
DO NOT GET IN EYES. AVOID SKIN CONTACT. CAN CAUSE ALLERGIC RESPIRATORY REACTION. CAN CAUSE ALLERGIC SKIN REACTION. PREVENT PROLONGED OR REPEATED BREATHING OF VAPORS OR SPRAY MIST. AVOID BREATHEING OF SANDING DUST. WASH CONTAMINATED CLOTHING THOROUGHLY. WASH SKIN THOROUGHLY WITH SOAP AND WATER AFTER HANDLING. CLOSE CONTAINER AFTER EACH USE. DO NOT TRANSFER THIS PRODUCT TO UNLABELED CONTAINERS. DO NOT HANDLE UNTIL THE MANUFACTURERS SAFETY PRECAUTIONS HAVE BEEN READ AND UNDERSTOOD. KEEP OUT OF REACH OF CHILDREN.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION
USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE, WHEN EXPOSURE EXCEEDS OCCUPATIONAL EXPOSURE LIMITS (SECTION II). USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS IN COMPLIANCE WITH 29 CFR 1910.134, WITH PROVISION FOR MIST REMOVAL IF CONDITIONS SO INDICATE.

VENTILATION
ALL APPLICATION AREAS SHOULD BE VENTILATED IN ACCORDANCE TO OSHA REGULATION 29 CFR 1910.94, 1910.187, 1910.188. REMOVE DECOMPOSITION PRODUCTS FORMED DURING WELDING OR FLAME CUTTING ON SURFACE COVERED WITH THIS PRODUCT. IF BAKING VENT FLUES.

PROTECTIVE GLOVES
RECOMMENDED.

EYE PROTECTION
SAFETY EYEWEAR INCLUDING SPLASH GUARDS OR SIDE SHIELDS RECOMMENDED.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
USE PROTECTIVE OUTERWEAR AND PREVENT PROLONGED SKIN CONTACT WITH CONTAMINATED CLOTHING.

WASH/HYGIENIC PRACTICES
AVOID BREATHING VAPORS AND CONTACT WITH SKIN. WASH SKIN THOROUGHLY BEFORE BREAKS AND MEALS AND AT END OF WORK PERIOD.

SECTION IX - DISCLAIMER

DISCLAIMER
THE INFORMATION PROVIDED IN THIS MSDS HAS BEEN OBTAINED FROM SOURCES BELIEVED TO BE ACCURATE AND RELIABLE. IT IS FURNISHED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. RECIPIENTS SHOULD DETERMINE THAT THE INFORMATION IS CURRENT AND SUITABLE FOR THE PROTECTION OF THE ENVIRONMENT AND THE HEALTH AND SAFETY OF YOUR EMPLOYEES AND USERS OF THIS PRODUCT.
Material Name: Thorobond

This form covers Smooth, Fine and Coarse Thorobond, all standard colors and tinting bases.

HMIS:
Health 1
Fire 0
Reactivity 0
Personal Protection x

Section II - Ingredients/Identity Information

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>% Wgt</th>
<th>ACGIH TLV</th>
<th>STEL</th>
<th>OSHA PEL</th>
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<tr>
<td>Diethylene glycol ethyl ether (111-90-0)</td>
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<td>Ethylene Glycol (107-21-1)</td>
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<td>Dibutyl phthalate (84-74-2)</td>
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<td>Polyvinylacetate aqueous emulsion</td>
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Ingredients not precisely identified are proprietary or nonhazardous. Values are not product specifications. gr=greater than; lt=less than, ca=approximately, NE=not established, C=Ceiling

Section III - Physical/Chemical Characteristics

BOILING POINT: no data available  about 212 for water
VAPOR PRESSURE (mm Hg): Not applicable - solid at all service temperatures
VAPOR DENSITY (AIR = 1): not applicable
pH: no data available
SPECIFIC GRAVITY (H2O=1): about 1.1
% Volatile by volume: about 50
Solubility in Water: Soluble

A-70
Section IV - Fire and Explosion Hazard Data

FLASH POINT (METHOD USED): none

FLAMMABLE LIMITS: not applicable
LEL:
UEL:

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE FIGHTING PROCEDURES:
A self-contained breathing apparatus and full protective gear should
be used when fighting fires involving this material.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
If heated to thermal decomposition acrid fumes including oxides
of carbon will be evolved.

Section V - Reactivity Data

STABILITY (CHOOSE ONE): ( ) UNSTABLE
(x) STABLE

CONDITIONS TO AVOID: Not applicable

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CO, CO2

HAZARDOUS (CHOOSE ONE): ( ) MAY OCCUR
(x) WILL NOT OCCUR

CONDITIONS TO AVOID: not applicable

Section VI - Health Hazard Assessment

General: No toxicity information is available on this specific preparation;
this health hazard assessment is based on information that is available on
its components.

Ingestion: The principal toxic effect will likely be due to ethylene
glycol which causes kidney damage. Symptoms of ingestion may include
abdominal discomfort and pain, dizziness, malaise, lumbar pain, CNS
depression and other symptoms related to ethylene glycol ingestion.
Severe kidney damage accompanies gross overexposure.
Dibutyl phthalate is an irritant and a possible teratogen. Overexposures
may cause reproductive disorders. Exposures can cause nausea, dizziness
and headache.
Eye Contact: This material can irritate human eyes following
contact.
Section VI - Health Hazard Assessment (Cont.)

Skin Contact: May cause skin irritation.
This material is not absorbed through the skin.
Inhalation: Toxic concentrations of vapors is unlikely. High-vapor
concentrations from heating and/or use in a confined area may be
irritating and may cause headache, dizziness, nausea and vomiting.

Other Effects of overexposure: Ethylene glycol can be absorbed through
the skin. During normal use and handling no hazard should exist.

EMERGENCY FIRST AID PROCEDURES:
Inhalation:
Remove victim to fresh air. If breathing is difficult administer oxygen.
Consult a physician.
Ingestion:
Seek medical attention immediately.

Eye Contact:
Flush with water for at least 15 minutes. Obtain medical attention.
Consult medical personnel.
Skin Contact:
Wash with soap. Flush with water for at least 15 minutes.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep unnecessary people away. Follow personal protection procedures
when cleaning spills. Dike and contain spill with inert material.
Transfer liquid to containers for recovery and disposal. Transfer solid
diking/absorbent to separate containers for disposal. Keep runoff and spills
out of sewers and bodies of water. Caution: Spill area may be slippery.
Use caution to avoid falls.

WASTE DISPOSAL METHOD:
Reuse contaminated material if possible. Landfill or incinerate
solids and contaminated material in accordance with all local, state
and federal regulations.

Container Disposal:
Empty containers may retain small amounts of residual product. Observe all
hazard precautions and personal protection recommendations when
handling empty containers. Dispose of waste in
accordance with all applicable regulations.

Section VIII - Special Protection Information

TLV or Suggested Control Value: No TLV has been assigned to this
mixture. Minimize exposures in accordance with good hygiene practices.

Ventilation:
Use local exhaust to keep exposures at a minimum.
RESPIRATORY PROTECTION (SPECIFY TYPE):
None required under normal conditions. If OSHA PEL standards are exceeded then use an appropriate MSHA-NIOSH approved respirator for the hazard.

Protective clothing:
Gloves and protective clothing are recommended.

EYE PROTECTION: Chemical tight goggles; full face shield if splashing is possible.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Eyewash, safety showers

SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS:
Prevent skin and eye contact. Observe TLV limitations. Avoid breathing vapors, mists or aerosols of this product. Keep product from freezing.

SECTION X MISCELLANEOUS INFORMATION
none

Prepared By: Lawrence Templin date: June 28th 1994
Section I - General Information

Manufacturer:
Thoro System Products Inc
A Division of
Harris Specialty Chemicals, Inc.
8570 Philips Highway
Jacksonville, Fl 32256-8208

Emergency Phone: Chemtrec 1-800-424-9300

Material Name: Thoroflex RC

HMIS:
Health 1
Fire 0
Reactivity 0
Personal Protection x

Section II - Ingredients/Identity Information

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>% Wgt</th>
<th>ACGIH TLV</th>
<th>STEL</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>30 - 40</td>
<td>10 mg/m^3</td>
<td>none</td>
<td>10 mg/m^3 (total dust)</td>
</tr>
<tr>
<td>Acrylic Emulsion</td>
<td>35 - 40</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>0 - 1</td>
<td>50 ppm</td>
<td>none</td>
<td>50 ppm</td>
</tr>
</tbody>
</table>

Ingredients not precisely identified are proprietary or nonhazardous.
Values are not product specifications. gt=greater than; lt=less than,
ca=approximately, NE=not established, C=Ceiling

Section III - Physical/Chemical Characteristics

BOILING POINT: High - 389 Low- 212 F
VAPOR PRESSURE(mm Hg): No data available
VAPOR DENSITY (AIR = 1): > 1
pH: 5.2 - 10
SPECIFIC GRAVITY (H2O=1): No data available
% Volatile by volume: No data available
APPEARANCE AND ODOR: White liquid with a slight ammonia odor
Solubility in Water: Soluble
Section IV - Fire and Explosion Hazard Data

FLASH POINT (METHOD USED): none

FLAMMABLE LIMITS: not applicable
LEL:
UEL:

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE FIGHTING PROCEDURES:
A self-contained breathing apparatus and full protective gear should be used when fighting fires involving this material.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Monomer vapors may be evolved at elevated temperatures. Dried polymer films are capable of burning yielding oxides of carbon.

Section V - Reactivity Data

STABILITY (CHOOSE ONE): ( ) UNSTABLE
( ) STABLE

CONDITIONS TO AVOID: Not applicable

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents, acids, ammonium salts

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None

HAZARDOUS POLYMERIZATION (CHOOSE ONE): ( ) MAY OCCUR
( ) WILL NOT OCCUR

CONDITIONS TO AVOID: not applicable

Section VI - Health Hazard Assessment

General: No toxicity information is available on this specific preparation; this health hazard assessment is based on information that is available on its components.

Ingestion: The principle toxic effect of this product, when swallowed, is likely to be due to the ethylene glycol content which causes kidney damage. Symptoms of ingestion may include abdominal discomfort, malaise, central nervous system depression and other symptoms related to ethylene glycol ingestion. Severe kidney damage accompanies severe overexposure. Pre-existing blood or kidney disorders can be aggravated.

Eye Contact: This material can cause severe eye irritation following contact.
Section VI - Health Hazard Assessment (Cont.)

Skin Contact: Can cause moderate skin irritation. This material will probably not be absorbed through the skin.

Inhalation: Inhalation of vapors and mists of this product may cause irritation of the nose and throat, headache, nausea and central nervous system depression. Prolonged exposure may cause kidney damage.

Other Effects of overexposure: None

EMERGENCY FIRST AID PROCEDURES:
Inhalation:
Remove victim to fresh air. If breathing is difficult administer oxygen.
Consult a physician.

Ingestion:
Give one or two glasses of water to drink and seek medical attention.

Eye Contact:
Flush with water for at least 15 minutes. Obtain medical attention consult medical personnel.

Skin Contact:
Wash with soap. Flush with water for at least 15 minutes.

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILED:
Keep unnecessary people away. Follow personal protection procedures when cleaning spills. Dike and contain spill with inert material.
Transfer liquid to containers for recovery and disposal. Transfer solid diking/absorbent to separate containers for disposal. Keep runoff and spills out of sewers and bodies of water. Caution: Spill area may be slippery.
Use caution to avoid falls.

WASTE DISPOSAL METHOD:
Discarded product is a non-hazardous waste under RCRA criteria (40 CFR, part 261). However, even small amounts of emulsion will discolor bodies of water. Reuse contaminated material if possible. Landfill or incinerate solids and contaminated material in accordance with all local, state and federal regulations.

Container Disposal:
Empty containers may retain small amounts of residual product. Observe all hazard precautions and personal protection recommendations when handling empty containers. Dispose of as a non-hazardous waste in accordance with all applicable regulations.
Section VIII - Special Protection Information

TLV or Suggested Control Value: No TLV has been assigned to this mixture. Minimize exposures in accordance with good hygiene practices.

Ventilation:
Use local exhaust to keep exposures at a minimum.

RESPIRATORY PROTECTION (SPECIFY TYPE):
None required under normal conditions. If OSHA PEL standards are exceeded then use an appropriate MSHA-NIOSH approved respirator for the hazard.

Protective clothing:
Impervious gloves, long trousers, long-sleeved shirt and appropriate footwear recommended to avoid skin contact.

EYE PROTECTION: Chemical tight goggles; full face shield if splashing is possible.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Eye wash, safety showers

SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS:
Prevent skin and eye contact. Observe TLV limitations. Avoid breathing vapors, mists or aerosols of the product. Keep product from freezing.

SECTION X MISCELLANEOUS INFORMATION

Transportation Classification: DOT Hazard Class: None (non-hazardous)
IATA - None
No UN or NA numbers required.
SARA Title III: Non-hazardous.
This product does not contain a chemical which is listed in Section 313 above the de minimis concentration.
Prop 65: This product is non-hazardous under Proposition 65 in the state of California.
CERCLA: Releases of this product to the air, land, or water are not reportable to the National Response Center under CERCLA or state and local governments under SARA Title III.
RCRA: This product is non-hazardous under RCRA.
Section I - General Information

Harris Specialty Chemicals
PCR Inc. - Thoro Systems, Inc.
P.O. Box 1466
Gainesville, Florida 32602
Phone: (904) - 376-8246

Material Name: Thoropatch

HMIS:
Health 2
Fire 0
Reactivity 0
Personal Protection x

Section II - Ingredients/Identity Information

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>% Wgt</th>
<th>ACGIH TLV</th>
<th>STEL</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline quartz 70-80 (CAS 14808-60-7)</td>
<td>0.1 mg/m3 (respirable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portland cement (CAS 65997-15-1)</td>
<td>10 mg/m3 total dust</td>
<td>10 mg/m3 total dust, 5 mg/m3 respirable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium hydroxide (CAS 1305-62-0)</td>
<td>5 mg/m3 Respirable</td>
<td>5 mg/m3 (Respirable)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ingredients not precisely identified are proprietary or nonhazardous. Values are not product specifications. gt=greater than; lt=less than, ca=approximately, NE=not established, C=Ceiling

Section III - Physical/Chemical Characteristics

VAPOR PRESSURE (mm Hg): Not applicable - solid

Viscosity (cP) = 1: not applicable

pH: no data available - strongly basic when mixed

SPECIFIC GRAVITY (H2O=1): no data

% Volatile by volume: negligible

APPEARANCE AND ODOR: gray powdered solid. No odor

Solubility in Water: Slight
FLASH POINT (METHOD USED): none

FLAMMABLE LIMITS: not applicable
   LEL:
   UEL:

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE FIGHTING PROCEDURES:
   Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS:
   None known

STABILITY (CHOOSE ONE): ( ) UNSTABLE
   (x) STABLE

CONDITIONS TO AVOID: Products hydrates at a slow, controlled
   rate when mixed with water releasing minimal heat.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents such as
   organic and inorganic acids. Acids will react with cement, lime and carbonate.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None

HAZARDOUS POLYMERIZATION (CHOOSE ONE): ( ) MAY OCCUR
   (x) WILL NOT OCCUR

CONDITIONS TO AVOID: not applicable

General: No toxicity information is available on this specific preparation;
   this health hazard assessment is based on information that is available on
   its components.

Ingestion: No known toxic effects. May cause digestive tract irritation.

Eye Contact: This material can irritate and burn human eyes following
   contact. The aggregate particles may cause corneal abrasions.

Skin Contact: Dryness, itching, rashes and burns can develop following
   contact with the skin. Skin abrasions can occur if material is rubbed
   against the skin. Dermatitis and skin sensitization can develop after
   repeated or prolonged exposure.
   This material is not absorbed through the skin.
Section VI - Health Hazard Assessment (Cont.)

Inhalation: Repeated inhalation of silica in excess of the TLV over extended periods can result in irreversible fibrosis of the lungs (silicosis).
Overexposure to dusts can irritate the respiratory tract and cause damage to the mucous membranes of the upper respiratory tract. IARC has associated high exposures to crystalline silica with cancer in laboratory animals.

Other Effects of overexposure: No other clinical effects are known to be associated with this material.

EMERGENCY FIRST AID PROCEDURES:

Inhalation:
Remove victim to fresh air. If breathing is difficult administer oxygen.
Consult a physician.

Ingestion:
Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. Never give anything by mouth to an unconscious person.
Eye Contact: Do not rub eyes.
Flush with water for at least 15 minutes. Obtain medical attention
Consult medical personnel.
Skin Contact: Do not rub skin.
Wash with soap. Flush with water for at least 15 minutes

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep unnecessary people away. Follow personal protection procedures when cleaning spills: Collect spilled powder by dustless methods and place in a container. If necessary, dike spills of mixed materials, mix with absorbent material and shovel into waste containers. Avoid generating dust. Wet material may be slippery - Use caution to avoid falls.

WASTE DISPOSAL METHOD:
Reuse powder or mixed material if uncontaminated. Discarded product and hardened mortar are non-hazardous under RCRA (40 CFR, part 261). Dispose of non-hazardous waste in compliance with applicable regulations.

Container Disposal:
Empty containers may retain small amounts of residual product. Observe all hazard precautions and personal protection recommendations when handling empty containers. Dispose of as a non-hazardous waste in accordance with all applicable regulations.

Section VIII - Special Protection Information

TLV or Suggested Control Value: No TLV has been assigned to this mixture. Minimize exposures in accordance with good hygiene practices.

Ventilation:
Use local exhaust to keep exposures below limits set for silica,
Section VIII - Special Protection Information (Cont.)

Portland cement and nuisance dusts.

RESPIRATORY PROTECTION (SPECIFY TYPE):
Where exposures to dusts from this product may exceed the exposure limits an MSHA-NIOSH approved dust respirator for the dust should be used.

Protective clothing:
Gloves and protective clothing are recommended.

EYE PROTECTION: Chemical tight goggles; full face shield if splashing is possible. Safety glasses if grinding, cutting, etc. of hardened material is required.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Eyewash, safety showers

SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS:
Prevent skin and eye contact. Observe TLV limitations. Avoid breathing dusts. Sensitized individuals should not be exposed to the product which caused sensitization. Store in a cool, dry area off the ground. Minimize generation of dust.

SECTION X MISCELLANEOUS INFORMATION

PEL for silica, crystalline quartz:

For respirable dust in mg/m3: 10 mg/m3
\[ \frac{10 \text{ mg/m3}}{\% \text{ SiO2} + 2} \]

For total dust in mg/m3: 30 mg/m3
\[ \frac{30 \text{ mg/m3}}{\% \text{ SiO2} + 2} \]

Prepared By: Lawrence Templin  date: June 28th 1994
**THOROSEAL**

**THORO SYSTEM PRODUCTS**

**Section I - General Information**

Manufacturer:
Thor System Products Inc
A Division of
Harris Specialty Chemicals, Inc.
8570 Philips Highway
Jacksonville, FL 32256-8208

Emergency Phone: Chemtrec 1-800-424-9300

Material Name: Thoroseal  This form covers all colors

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>x</td>
</tr>
</tbody>
</table>

**Section II - Ingredients/Identity Information**

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>Chemical ID</th>
<th>% Wgt</th>
<th>ACGIH TLV</th>
<th>STEL</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, crystalline quartz</td>
<td>(CAS 14808-60-7) 40 - 50</td>
<td>0.1 mg/m³ (respirable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portland cement</td>
<td>(CAS 65997-15-1) 40 - 60</td>
<td>10 mg/m³ total dust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>(CAS 1305-62-0) 1 - 5</td>
<td>5 mg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>(CAS 13463-67-7) 1 - 5</td>
<td>5 mg/m³ respirable, 10 mg/m³ total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>1 - 5</td>
<td>none</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ingredients not precisely identified are proprietary or nonhazardous. Values are not product specifications. gt=greater than; lt=less than, ca=approximately, NE=not established, C=Ceiling
Section III - Physical/Chemical Characteristics

BOILING POINT: no data available
VAPOR PRESSURE (mm Hg): Not applicable - solid at all service temperatures
VAPOR DENSITY (AIR = 1): not applicable
pH: no data available - strongly basic when mixed with water
SPECIFIC GRAVITY (H2O=1): no data
% Volatile by volume: negligible
APPEARANCE AND ODOR: white, gray or pastel powder.
Solubility in Water: Slight

Section IV - Fire and Explosion Hazard Data

FLASH POINT (METHOD USED): none

FLAMMABLE LIMITS: not applicable
LEL:
UEL:

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE FIGHTING PROCEDURES:
Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None known

Section V - Reactivity Data

STABILITY (CHOOSE ONE): ( ) UNSTABLE
(x) STABLE

CONDITIONS TO AVOID: Products hydrates at a slow, controlled rate when mixed with water releasing minimal heat.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents such as organic and inorganic acids. Acids will react with cement, lime and carbonate.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None

HAZARDOUS POLYMERIZATION (CHOOSE ONE): ( ) MAY OCCUR
(x) WILL NOT OCCUR

CONDITIONS TO AVOID: not applicable
Section VI - Health Hazard Assessment

General: No toxicity information is available on this specific preparation; this health hazard assessment is based on information that is available on its components.

Ingestion: No known toxic effects. May cause digestive tract irritation.

Eye Contact: This material can irritate and burn human eyes following contact. The aggregate particles may cause corneal abrasions.

Skin Contact: Dryness, itching, rashes and burns can develop following contact with the skin. Skin abrasions can occur if material is rubbed against the skin. Dermatitis and skin sensitization can develop after repeated or prolonged exposure. This material is not absorbed through the skin.

Inhalation: Repeated inhalation of silica in excess of the TLV over extended periods can result in irreversible fibrosis of the lungs (silicosis). Overexposure to dusts can irritate the respiratory tract and cause damage to the mucous membranes of the upper respiratory tract. IARC has associated high exposures to crystalline silica with cancer in laboratory animals.

Other Effects of overexposure: No other clinical effects are known to be associated with this material.

EMERGENCY FIRST AID PROCEDURES:

Inhalation:
Remove victim to fresh air. If breathing is difficult administer oxygen.
Consult a physician.

Ingestion:
Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. Never give anything by mouth to an unconscious person.

Eye Contact: Do not rub eyes.
Flush with water for at least 15 minutes. Obtain medical attention Consult medical personnel.

Skin Contact: Do not rub skin.
Wash with soap. Flush with water for at least 15 minutes

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep unnecessary people away. Follow personal protection procedures when cleaning spills. Collect spilled powder by dustless methods and place in a container. If necessary, dike spills of mixed materials, mix with absorbent material and shovel into waste containers. Avoid generating dust. Wet material may be slippery - Use caution to avoid falls.

WASTE DISPOSAL METHOD:
Reuse powder or mixed material if uncontaminated. Discarded product and hardened mortar are non-hazardous under RCRA (40 CFR, part 261). Dispose of non-hazardous waste in compliance with applicable regulations.
Section VII - Precautions for Safe Handling and Use (Cont.)

Container Disposal:
Empty containers may retain small amounts of residual product. Observe all hazard precautions and personal protection recommendations when handling empty containers. Dispose of as a non-hazardous waste in accordance with all applicable regulations.

Section VIII - Special Protection Information

TLV or Suggested Control Value: No TLV has been assigned to this mixture. Minimize exposures in accordance with good hygiene practices.

Ventilation:
Use local exhaust to keep exposures below limits set for silica, Portland cement and nuisance dusts.
RESPIRATORY PROTECTION (SPECIFY TYPE):
Where exposures to dusts from this product may exceed the exposure limits an MSHA-NIOSH approved dust respirator for the dust should be used.

Protective clothing:
Gloves and protective clothing are recommended.

EYE PROTECTION: Chemical tight goggles; full face shield if splashing is possible. Safety glasses if grinding, cutting, etc. of hardened material is required.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
Eyewash, safety showers
SECTION 9 SPECIAL PRECAUTIONS OR OTHER COMMENTS:
Prevent skin and eye contact. Observe TLV limitations. Avoid breathing dusts. Sensitized individuals should not be exposed to the product which caused sensitization.
Store in a cool, dry area off the ground. Minimize generation of dust.

SECTION X MISCELLANEOUS INFORMATION

PBL for silica, crystalline quartz:

- For respirable dust in mg/m$^3$: \(10 \text{mg/m}^3\)
  \[
  \frac{10 \text{mg/m}^3}{\% \text{SiO}_2 + 2}
  \]

For total dust in mg/m$^3$:
\[
\frac{30 \text{mg/m}^3}{\% \text{SiO}_2 + 2}
\]

Prepared By: Lawrence Templin 

date: June 28th 1994
MATERIAL SAFETY DATA SHEET

Page 1 of 5
Revised 1/23/96
Replaces 8/30/95
Printed 3/14/96

WATERPLUG
THORO SYSTEM PRODUCTS

WATERPLUG

Section I - General Information

Manufacturer:
Watson Bowman
a Division of:
Harris Specialty Chemicals, Inc.
8570 Philips Highway
Jacksonville, FL 32256-8208
904-828-4996

Emergency Contact: Chemtrec 1-800-424-9300

Material Name: Waterplug

HMIS:
Health 3
Fire 0
Reactivity 0
Personal Protection x

Section II - Ingredients/Identity Information

HAZARDOUS COMPONENTS
Chemical ID % Wgt ACGIH TLV STEL OSHA PEL
Silica, crystalline quartz 25 - 30 0.1 mg/m³ (respirable)
(CAS 14808-60-7)
Portland cement 70 - 75 10 mg/m³ total dust 10 mg/m³ total dust,
(CAS 65997-15-1)
Calcium hydroxide 0 - 5 5 mg/m³ none
(CAS 1305-62-0)
Calcium carbonate 0 - 1 10 mg/m³ total 10 mg/m³ total
(CAS 1317-65-3)

Ingredients not precisely identified are proprietary or nonhazardous.
Values are not product specifications. gt=greater than; lt=less than,
ca=approximately, NE=not established, C=Ceiling
Section III - Physical/Chemical Characteristics

BOILING POINT: no data available
VAPOR PRESSURE (mm Hg): Not applicable - solid at all service temperatures
VAPOR DENSITY (AIR = 1): not applicable
pH: no data available - strongly basic when mixed with water
SPECIFIC GRAVITY (H2O=1): no data
% Volatile by volume: negligible
APPEARANCE AND ODOR: Medium to dark-gray powdered solid. No odor
Solvability in Water: Slight

Section IV - Fire and Explosion Hazard Data

FLASH POINT (METHOD USED): none

FLAMMABLE LIMITS: not applicable
  LEL:
  UEL:

EXTINGUISHING MEDIA: Not applicable

SPECIAL FIRE FIGHTING PROCEDURES: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known

Section V - Reactivity Data

STABILITY (CHOOSE ONE): ( ) UNSTABLE (x) STABLE

CONDITIONS TO AVOID: Products hydrates at a slow, controlled rate when mixed with water releasing minimal heat.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents such as organic and inorganic acids. Acids will react with cement, lime and carbonate.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: None

HAZARDOUS (CHOOSE ONE): ( ) MAY OCCUR (x) WILL NOT OCCUR

POLYMERIZATION

CONDITIONS TO AVOID: not applicable
Section VI - Health Hazard Assessment

General: No toxicity information is available on this specific preparation; this health hazard assessment is based on information that is available on its components.

Ingestion: No known toxic effects. May cause digestive tract irritation.

Eye Contact: This material can irritate and burn human eyes following contact. The aggregate particles may cause corneal abrasions.

Skin Contact: Dryness, itching, rashes and burns can develop following contact with the skin. Skin abrasions can occur if material is rubbed against the skin. Dermatitis and skin sensitization can develop after repeated or prolonged exposure.

This material is not absorbed through the skin.

Inhalation: Repeated inhalation of silica in excess of the TLV over extended periods can result in irreversible fibrosis of the lungs (silicosis). Overexposure to dusts can irritate the respiratory tract and cause damage to the mucous membranes of the upper respiratory tract. IARC has associated high exposures to crystalline silica with cancer in laboratory animals.

Other Effects of overexposure: No other clinical effects are known to be associated with this material.

EMERGENCY FIRST AID PROCEDURES:

Inhalation:
Remove victim to fresh air. If breathing is difficult administer oxygen.
Consult a physician.

Ingestion:
Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. Never give anything by mouth to an unconscious person.

Eye Contact: Do not rub eyes.
Flush with water for at least 15 minutes. Obtain medical attention
Consult medical personnel.

Skin Contact: Do not rub skin.
Wash with soap. Flush with water for at least 15 minutes

Section VII - Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Keep unnecessary people away. Follow personal protection procedures when cleaning spills. Collect spilled powder by dustless methods and place in a container. If necessary, dike spills of mixed materials, mix with absorbent material and shovel into waste containers. Avoid generating dust. Wet material may be slippery - Use caution to avoid falls.

WASTE DISPOSAL METHOD:
Reuse powder or mixed material if uncontaminated. Discarded product and hardened mortar are non-hazardous under RCRA (40 CFR, part 261). Dispose of non-hazardous waste in compliance with applicable regulations.

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Container Disposal:
Empty containers may retain small amounts of residual product. Observe all
hazard precautions and personal protection recommendations when
handling empty containers. Dispose of as a non-hazardous waste in
accordance with applicable regulations.

Section VIII - Special Protection Information

TLV or Suggested Control Value: No TLV has been assigned to this
mixture. Minimize exposures in accordance with good hygiene practices.

Ventilation:
Use local exhaust to keep exposures below limits set for silica,
Portland cement and nuisance dusts.

Respiratory Protection (Specify Type):
Where exposures to dusts from this product may exceed the exposure limits
an MSHA-NIOSH approved dust respirator for the dust should be used.

Protective clothing:
Gloves and protective clothing are recommended.

Eye Protection: Chemical: tight goggles; full face shield if splashing
is possible. Safety glasses if grinding, cutting, etc. of hardened
material is required.

Other Protective Clothing or Equipment:

Eye wash, safety showers

Section 9 Special Precautions or Other Comments:
Prevent skin and eye contact. Observe TLV limitations. Avoid breathing
dusts. Sensitized individuals should not be exposed to the
product which caused sensitization.
Store in a cool, dry area off the ground. Minimize generation of dust.

Section X Miscellaneous Information

PEL for silica, crystalline quartz:

- For respirable dust in mg/m³: 10mg/m³
  1000 % SiO₂ - 2

- For total dust in mg/m³: 30 mg/m³
  1000 % SiO₂ - 2

This product contains crystalline silica, a material that is known
to the State of California to cause cancer.
Section VIII - Special Protection Information (Cont.)

Prepared By: Lawrence Templin  date: June 28th 1994
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SPECIFICATION DATA

1. ROOF COATINGS
PRODUCT DESCRIPTION
Carib Coat is a 100% acrylic and non-toxic, seamless elastomeric roof membrane coating. It is a proven top weather-beaten in high build textured applications. It forms a durable, watertight, seamless coating. Can be applied to galvanized, aluminum, properly primed steel, iron, cement, wood.

ADHESION
Carib Coat roof coating adheres stubbornly to concrete, asphalt shingles, roofing paper, tile, slate, wood, steel cement, galvanized aluminum, (180°F peel to ceramic tile). Passes cup test — no cracking or pulling away from cup.

RESISTANCE TO PONDING WATER
Carib Coat offers especially high resistance to ponding water. (3.1 in/24 hr in 25 cm).

SETTLING
No settling or separation. No stirring or mixing required.

SOLIDS
Percent solids by Weight 71.9%
Volume 56.0%
Weight per gallon 13.03 lbs.

ELONGATION AND TENSILE STRENGTH
Excellent elongation and tensile strength allows Carib Coat to expand and contract with the surface to which applied without wrinkling or cracking. (Tensile strength: 200 psi, Elongation: 350%)

PERMEABILITY @ 25 MILS DRY
9.72 perms

COVERAGE
On smooth surfaces, 100 sq. ft. per gallon.
Two coats are recommended to achieve a dry mil thickness of 10 to 20.

SURFACE PREPARATION AND APPLICATION
For maximum adhesion, use a pressure washer (2000 psi or higher). This will remove any loose dirt, paint, and other contaminants on the surface. If there is any rust present, wire brush the area and spot prime with a quality rust inhibitive alkyl paint and allow to dry.

No reinforcing mesh required when a minimum 25 to 30 mils dry is used otherwise at seams, brush a thick coat of Carib Coat and imbed ester tape in it. Apply a top coating of Carib Coat over that. Allow to dry overnight before applying finish coats.

Carib Coat may be applied with an airless, roller or brush.

QUESTIONS?
If you have any questions on application or preparation of your roof, you may call the manufacturer direct.

All technical advice, recommendations and services are rendered by the Seller gratuitously. They are based on technical data which the Seller believes to be reliable and true as of the date of these data. The Seller assumes no responsibility for results obtained on bases of materials not approved by the Seller or as otherwise. The Seller's representatives, its agents or employees do not assume any liability with respect to the use of notes or drawings or services are not to be taken as a license to operate in the product or to manufacture or to grant patents. 1972 Version of all patents, data sheets posted on this product.

Keep away from best and pets. Keep out of reach of children. Avoid breathing vapors or spray mist and prolonged contact with skin.

Technical Coatings Industries
P.O. Box 2950
Christianssted, St. Croix U.S.V.I. 00820
Tel. (340) 773-2018
Fax (809) 773-0399
Manufacturers of special polyurethane paints for industrial, commercial and residential markets.

Manufacturers of TropiCoat
CARIBBEAN CUSTOM ELASTOMERIC
Roof Coating Reflective White 22-DW-76
100% Acrylic Emulsion

An elastomeric smooth-textured acrylic roof coating with superior flexibility and elongation to expand and contract with roof surfaces. Non-toxic - Lead, chromate, mercury and asbestos free. Low VOC.

Specially formulate for Caribbean homes using cisterns. Offers excellent waterproofing protection with a thick, rubber-like coating to most types of roofs. Can be used on aluminum, weathered galvanized metal, wood, asphalt shingles, built-up roofs, urethane foam, concrete, well bonded gravel roofs and cement tiles.

This product is formulated to offer superior weatherability and durability even in cold temperatures. The extreme brightness of the coating reflects the rays of the sun, dramatically reducing roof temperatures and saving on air conditioning cost. Low VOC. Lead, mercury and chromate free. Contains no asbestos.

Reflective White

Low sheen

<table>
<thead>
<tr>
<th>Nonvolatile -</th>
<th>By weight - 65.7 ± 1.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>By volume - 50.7 ± 1.0%</td>
</tr>
<tr>
<td>VOC (Calculated) -</td>
<td>0.7 lbs./gal.</td>
</tr>
<tr>
<td>(excluding water) -</td>
<td>78 grams/liter</td>
</tr>
<tr>
<td>Flash Point -</td>
<td>&gt;250°F (Setaflash)</td>
</tr>
<tr>
<td>Weight per gallon -</td>
<td>12.2 ± 0.2 lbs.</td>
</tr>
<tr>
<td>Light Reflectance Value -</td>
<td>92</td>
</tr>
</tbody>
</table>

Recommended Film Thickness - Two coats for a total of 15-20 mils dry.

Theoretical Coverage @ 15.0 mils dry- 50 sq.ft./gal

Method - Brush, roll or airless spray.

Thinner - Water

Dry time @ 75°F -

- To touch - 1 hour
- To handle - 3-4 hours
- To recoat - 24 hours

Consists of -

<table>
<thead>
<tr>
<th>1 Gallon Unit</th>
<th>5 Gallon Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Shipping Weight -</td>
<td>13 lbs.</td>
</tr>
</tbody>
</table>

Shelf Life - 12 months minimum from date of manufacture when maintained in protected storage @ 40-100°F (subject to reinspection thereafter).
APPLICATION INSTRUCTIONS

Consult your Mobile Paint Representative for the protective coating system best suited for your requirements.

Limitations - Apply in good weather when air and surface temperature are above 50°F and surface temperature is at least 5°F above the dew point. For optimum application properties, material should be between 70 to 100°F prior to mixing and application. Maintain unmixed material in closed containers in protected storage at 50 - 100°F.

Surface Preparation - Good surface preparation is essential to a satisfactory coating system. Surfaces to be coated should be clean and dry. Remove all oil, grease, tar, or other contamination by solvent or detergent cleaning or other effective means.

Steel - Apply abrasive blasted steel. Commercial Blast Cleaning (SSPC-SP1) is recommended as the minimum. For immersion services, “Near White Blast Cleaning” (SSPC-SP10) is considered minimum. Proper blast media and blasting equipment shall be used to produce a clean surface free of rust, mill scale, or other contamination. Proper blasting pressure may vary with surface condition, media, and equipment. Blasted surfaces shall be painted within 8 hours after blast treatment unless rusting or other contamination of the surface occurs. For severe service except for atmospheric exposure blast cleaning prime with MoPoxy HB High Build Epoxy Primer and/or Mo Zinc or inorganic Zinc Primer.

Concrete - Must be clean and properly covered free of all surface contaminants “Concrete Blast” (SSPC-SP1) to provide a clean surface and to remove contamination and grease. Remove loose, deteriorating, and new concrete. A prime coat of MoPoxy HB will generate concrete and is highly recommended to provide a good base coating for application of MoPoxy HB. When applied as a prime coat, it will generate concrete up to 20% by volume up to 700 square feet per gallon.

Previously Finished Surfaces - Repair or discard areas. Repaint or discard areas. Remove coatings from previous paint by sanding or Brush Blasting (SSPC-SP7). Remove rust, corrosion, and oxidation from the surface. Paints that are not compatible with this coating system may be used. Always test a sample area in new work above. If coating exists containing compatibility between coating with the previous system, remove coating up to a new aesthetically pleasing area 24 hours after minimum film cure and adhesive bond testing weeks. Then apply MoPoxy HB coating. Mixing - MoPoxy HB is a two-component reaction with initial application. Always stir the container contents and add a complete unit of the proportions specified in Agitate Part A in a power mixer. Combine entire contents of Part B and Part A and mix into a clear, free of bubbles mixture. Allow mixing for 30 minutes and remix before application. Stable for 24 hours at the temperature of the material. Refer to Pot Life data on the label for

Thinning - Material is supplied at airless spray viscosity and should not require thinning. If thinning is necessary, thin with up to 1/2 pint MoPoxy Spraying Thinner 75-37 per gallon.

Application - Spray application is preferred for proper film build and best performance. Brush application is acceptable for touch up. Roller application may require special care to prevent bubbling and may require more than one coat to attain proper film thickness. Apply at 12-15 mils wet film thickness to achieve 6 mils dry film thickness.

Note: When applying over inorganic Zinc Primer it may be desirable to apply a primer “mist coat” and allow tiny bubbles to form. Follow with a full wet coat after bubbles disappear.

Equipment - Conventional spray - DeVilbiss MDC gun with E-60 and 30 air cap or equal at 50-90 psi atomizing pressure and 10-30 psi pot pressure. 36” ID product hose with double regulated pressure pot with oil and moisture separator. Airless Spray - Minimum of 30:1 ratio pump, 50” - 60” ft. 3/8” ID Teflon material hose.

Note: During lunch, breaks or any period of work stoppage, material should be removed from hoses and equipment. Release pressure from equipment and flush hoses and equipment with 75-35, 75-37 or MoPoxy solvents. Do not repressurize equipment until ready to resume work.

Cleanup - Clean all equipment immediately after use with MoPoxy Thinner 75-37 or MIBK. Completely flush all spray equipment with either of these solvents. Occasional flushing of spray equipment during the course of the working day helps prevent buildup and possible clogging.

Safety - Safe storage, handling and use dictate that adequate health and safety precautions be observed with this product and any recommended thinners. User is specifically directed to consult the current Material Safety Data Sheet for this product as well as precautions contained on product labeling.

Notice - The technical data contained herein are true and accurate to the best of our knowledge. All products are warranted and sold subject to Mobile Paint Manufacturing Company's Standard Conditions of Sale. Futhermore, technical data and instructions are subject to change without notice.
CEST-WPC
WHITE PIGMENTED, RESIN BASED CURING COMPOUND
APPLICATION & SAFETY INFORMATION

Vexcon MSDS #VM817 is an integral part of the safety and application of our product. A short synopsis is included in this product Data and Safety Sheet. Before using any product, it is advisable to get a copy of VM817 from your distributor or by calling the manufacturers at 800-288-2828 or Pacesetter Wire Products, Inc. at 803-751-8080.

COMMON NAME: Hydrocarbon and/or Water Solution Polymer Emulsion With Pigments

DOT SHIPPING NAME:
Curing Compound, Paint Related Material, Combustible Liquid

DOT NA = 1763

HMIS:

SPECIAL

HEALTH SAFETY: LERT

This product is a solvent-H2O emulsion. All precautions provided are for the solvent portion, of which this product contains less than 7%.

- Combustible Liquid
- Use only with adequate ventilation
- If swallowed, do not induce vomiting
- Use of gloves, goggles, and other protective clothing is advised when using this product.

VITAL STATISTICS

- Flash Point, 200°F. TCC
- Boiling Point, Atmospheric: MS = ~200°F, 760 mm Hg

- Autoignition Temperature: ND
- Extinguishing media: Foam, Wet Fog spray
CEST-WPC

Color

Dry Time

Flash Point

(Tag open cup)

Moisture retention

(typical) ASTM-C-309-81

AASHTO-148-83 Type II

ASTM-C-156-80

Solvent type

Wt./Gal.

Gardner 45% degree reflectance, standard to 85.0 test panel

Clean Up

PHYSICAL PROPERTIES

White

0.75:2.0 hours

1059 minimum

0.42 Kg/M2

Water solvent emulsion

9.00 - 9.3 lbs/gal

64% minimum

When wet, flush with water.

When dry, use mineral spirits to clean application equipment.

SPECIFICATIONS

CEST-WPC meets or exceeds AASHTO M-282 Type II, ASTM-C-309-81, Type II CEST-WPC is also available to meet U.S. Army Corps of Engineers CRD-C-300-70 and U.S. Bureau of Reclamation sealing compounds for concrete pipe and Federal Specification TT-C-800A type II Wax resin base is available to meet the above specifications

KEEP FROM FREEZING

CEST-WPC is supplied as a water based product. Not recommended for use at temperatures below 40°F (4°C).

COVERAGE

200 sq. ft. per gallon or less, depending on method of application

TOPCOATS AND ADHESIVES

CEST WPC will slowly fade off under sunlight and weathering. Topcoats or adhesives are not normally used. For painted curing compounds and are not recommended for use over CEST-WPC. CEMENT VEX WPC must be removed. Wire brushing is recommended. For alternative methods of removal contact the manufacturer.

PACKING

55 gallon drums

5 gallon pails

CEST™ MEANS "CERTIFIED PERFORMANCE"
CEST-WPC
WHITE PIGMENTED,
RESIN BASED
CURING COMPOUND

PRODUCT
& SAFETY
DATA

NON SETTLING - SPRAYABLE - UNIFORM
A hydrocarbon resin emulsion curing compound. Penetrates concrete surface and forms a tough continuous protective membrane allowing the concrete to develop maximum strength during its early hardening stage.

Used primarily on engineering projects such as highways, airport runways, concrete lines, canals, and concrete ramps.

When properly applied CEST-WPC provides complete development of concrete's wear resistance and strength properties while lowering concrete temperatures.

BENEFITS
Low moisture transmission rates.
Water borne for fewer health concerns and nonflammability
Seals surface, reducing clean-up and construction stains
Prevents efflorescence, dusting and spalling
Excellent toughness and chemical resistance
Economical

APPLICATION
Thoroughly mix before using or placing in spraying equipment or reservoir. Apply as soon as possible after the concrete has reached the finishing stage, just as the water sheen disappears. If application is delayed concrete must be mist wet preferably by water spray-mist prior to CEST-WPC can be applied.

TOPCOATS AND ADHESIVES
CEST WPC will slowly flake off after exposure to sunlight and weathering. Topcoats or adhesives are not normally used over CEST-WPC pigmented curing compounds and are not recommended for use over CEST-WPC. If CEST-WPC-WPC must be removed, wire brushing is recommended. For alternative methods of removal, contact the manufacturer.

PACKING
55 gallon drums
5 gallon pails

B-6 CEST™ MEANS "CERTIFIED PERFORMANCE"
COOL COTE NOT-TOXIC ROOF PAINT
Government Red 22-DR-9
Acrylic Emulsion

PRODUCT DESCRIPTION
A high quality 100% acrylic latex coating for roofs. Lead and chromate free.

TYPICAL USES
For industrial, commercial and residential use on weather exposed roof surfaces of masonry, unrusted galvanized metal or aluminum. For homes, condominums, apartments, warehouses, commercial buildings, factories and chemical plants. Not for application to flat roofs.

PRODUCT ADVANTAGES
COOL COTE LATEX ROOF PAINT offers excellent protection in exposures including mild industrial and marine environments. Excellent adhesion and flexibility. Excellent color retention, blister resistance and alkali resistance. Easy to apply, low odor and fast drying. Lead and chromate free. Low VOC.

COLORS

GLOSS
Flat

PHYSICAL CONSTANTS
Nonvolatile - By weight - 54.3 ± 1.0%
By volume - 41.0 ± 1.0%
VOC (Calculated) - 1.46 lbs./gal.
(excluding water) 172 grams/liter
Flash Point - >250 F (Setaflash)
Weight per gallon - 10.6 ± 0.2 lbs.

APPLICATION
Recommended Film Thickness - 2.0 mils dry, 4.9 mils wet
Theoretical Coverage @ 2.0 mils dry - 329 sq. ft./gal.
Method - Brush, roll, conventional and airless spray.
Thinner - Water
Dry time @ 75 F - To touch - 30 minutes
To handle - 1 hours
To recoat - 2 hours

SHIPPING & STORAGE
Consists of - 1 Gallon Unit 5 Gallon Unit
Unit Shipping Weight 12 lbs. 56 lbs.
Shelf Life - 12 months minimum from date of manufacture when maintained in protected storage @ 40-100 F (subject to reinspection thereafter).
## PRODUCT DATA

### SPECIFICATION GALVANIZING REPAIR COATING

**DOD-P-21035A (0080166)**

**Modified Synthetic Rubber**

---

### PRODUCT DESCRIPTION

A fast drying coating with a high zinc dust content. Meets the requirements of Military Specification DOD-P-21035A.

For repair of damaged areas of galvanized metal such as weld seams and abrasions.

Galvanizing Repair Coating is formulated to provide a protective zinc coating to damaged areas of galvanized metal surfaces. Provides excellent protection to welded or abraded areas where the protective galvanizing has been removed from the metal surface. Meets the requirements of Military Specification MIL-P-21035A.

Gray only

Matte

---

### PHYSICAL CONSTANTS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonvolatile</td>
<td>By weight - 74.4 ± 2.0%</td>
</tr>
<tr>
<td></td>
<td>By volume - 30.8 ± 1.0%</td>
</tr>
<tr>
<td>VOC (Calculated)</td>
<td>4.49 lbs./gal.</td>
</tr>
<tr>
<td></td>
<td>537 grams/liter</td>
</tr>
<tr>
<td>Flash Point</td>
<td>100°F (Setalash)</td>
</tr>
<tr>
<td>Weight per gallon</td>
<td>17.6 ± 0.2 lbs.</td>
</tr>
</tbody>
</table>

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### APPLICATION

Recommended Film Thickness - 2.0 mils dry, 6.5 mils wet

Theoretical Coverage @ 2.0 mils dry - 247 sq. ft./gal.

Method - Brush or conventional or airless spray.

Thinner - Tec Thinner 75-11 or XYLENE 75-15

Dry time @ 75°F -

- To touch - 2 hours max.
- Dry hard - 8 hours max.
- To recoat - 8 hours

---

### SHIPPING & STORAGE

<table>
<thead>
<tr>
<th>Consists of</th>
<th>1 Gallon Unit</th>
<th>5 Gallon Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>1 Gallon (SF)</td>
<td>5 Gallon (SF)</td>
</tr>
<tr>
<td>Zinc Dust (SF=short filled)</td>
<td>1 Quart (SF)</td>
<td>1 Gallon (SF)</td>
</tr>
</tbody>
</table>

Unit Shipping Weight - 19 lbs. 91 lbs.

Shelf Life - 6 months minimum from date of manufacture when maintained in protected storage @ 40-100°F (subject to reinspection thereafter).
APPLICATION INSTRUCTIONS

Consult your Mobile Paint Representative for the protective coating system best suited for your requirements.

Limitations: Apply in good weather when air and surface temperature are above 50°F and the surface temperature must be at least 5°F above the dew point. For optimum application properties, material should be between 70 to 100°F prior to mixing and application. Maintain unmixed material in closed containers in protected storage at 40-100°F.

Surface Preparation: Good surface preparation is essential to a satisfactory coating system. Surfaces to be coated should be clean and dry. Remove all oil, grease, mildew or other contamination by solvent or detergent cleaning or other effective means. Galvanized Steel: For application to abraded or damaged areas on galvanized metal. Sandblasting (see below) is recommended for best performance. If blasting is not feasible, clean and abrade surface by “Hand or Power Tool Cleaning” (SSPC-SP2 or SP3). Steel: Although this product is designed primarily as a primer for abraded or damaged areas on galvanized metal, it may be used as a touch up primer on bare steel. For best results, apply only to abrasive blasted steel. For best performance “Near White Blast Cleaning” SSPC-SP10 is recommended as proper preparation. “Commercial Blast Cleaning” SSPC-SP6 is acceptable for less severe exposures. Proper blast media and blasting equipment shall be used to produce an average profile depth of 1.5 mils minimum. Do not reuse sand abrasive media. Shot abrasives must be thoroughly clean of contamination before use. Remove blasting dust and grit from surfaces before painting. Blasted surfaces should be coated within 8 hours after blasting or before rusting or other contamination of the surface occurs.

Mixing: This is a single component coating. (1) Mix thoroughly with a power agitator to a uniform consistency before use. (2) Agitate at slow speed during use to keep zinc dust in suspension. (3) Keep system tightly closed and free from moisture.

Thinning: This product is supplied at normal spraying viscosity. If thinning is necessary thin with up to 1/2 pint 75-11 Tec Thinner or 75-15 Xylene.

Application: Apply by conventional or airless spray. Brush application is acceptable for touch up. Keep the material pressure pot at or near the level of the gun. Keep material hoses as short as possible (25 feet maximum recommended). Apply at 6.5 mils wet film thickness which will yield 2.0 mils dry film thickness.

Equipment: Brush - Use a good quality bristle brush. Conventional spray - For pressure feed, use DeVilbiss MBC gun with E tip and needle and 704 air cap or equivalent at 40-45 psi atomizing pressure and 10-15 psi fluid pressure, 3/8" ID material hose, double regulated pressure tank with oil and moisture separator. Airless spray - Minimum of 30:1 ratio pump, .023"-.027" orifice tip, 3/8" ID Teflon material hose. Special packings may be necessary due to the abrasive nature of the zinc dust in this product.

NOTE: During lunch, breaks or any period of work stoppage, material should be removed from hoses. Release pressure from equipment and flush hoses and equipment with Tec Thinner 75-11 or Xylene 75-15. Do not repressurize equipment until ready to resume work.

Cleanup: Clean all equipment immediately after use with Tec Thinner 75-11 or Xylene 75-15. Completely flush all spray equipment with either of these solvents. Occasional flushing of spray equipment during the course of the working day helps prevent buildup and possible clogging.

Topcoating: Recoat time will vary according to curing conditions. Allow a minimum of 8 hours at 75°F and 50% relative humidity before applying any topcoats. Many topcoats will require that a "mist" coat be applied prior to application of a full coat so that bubbling is minimized.

Safety: Safe storage, handling and use dictate that adequate health and safety precautions be observed with this product and any recommended thinners. User is specifically directed to consult the current Material Safety Data Sheet for this product as well as precautions contained on product labeling.

Notice: The technical data contained herein are true and accurate to the best of our knowledge. All products are offered and sold subject to Mobile Paint Manufacturing Company's Standard Conditions of Sale. Published technical data and instructions are subject to change without prior notice.

21035(10/92)
Mameco
Vulkem 450/451 System

Product Description
The Vulkem 450/451 System combines the unique benefits of the urethane-resistant base coat (Vulkem 450) with an ultraviolet-resistant topcoat (Vulkem 451) to yield an elastomeric and waterproof seamless coating. The flexibility and elasticity of the Vulkem 450/451 System allows for normal movement without substrate cracking. The quick drying, base-cured topcoat allows ease of application and subsequent labor savings over conventional two-component products.

Basic Uses:
The Vulkem 450/451 System is ideal for waterproofing and protection of roof decks, exposed panels, and walk decks on metal, concrete, and plywood. The system will withstand ponding water, which may collect in such areas. Vulkem 450/451 offers excellent water resistance at reduced coverage rates and is ideal for both horizontal and vertical applications.

Technical Data
Vulkem 450/451 System provides tremendous weather, chemical and mechanical damage resistance. The high build-high solids system forms a durable barrier to most airborne pollutants, residual factory emissions and other chemicals which will break down interior systems. In addition, the Vulkem 450/451 System is resistant to mold, mildew and microbiological attack which is a by-product of ponding water.

Flexibility at all temperatures is assured by the wall documented performance of Vulkem Urethanes. Sealant, Membrane and Coating Systems worldwide.

Substrates & Preparation
Concrete:
Concrete surface shall be clean, dry, free of frost and other contaminants.

New concrete decks shall be water cured or treated with Vulkem 2100 Dissipating Curing Compound and be in place a minimum of 14 days, preferably 28 days prior to application of the Vulkem 450/451 System.

Wood:
Exterior grade plywood is a suitable substrate after proper preparation. Surfaces shall be dry, smooth and free of dirt and dust. Wood surfaces shall be primed with Vulkem 171 primer prior to system application.

All joints between plywood sheets shall have a 1/16 inch (1.5mm) gap filled with Vulkem 116 sealant. Plywood shall be glued and firmly nailed with ring shank nails.

Structural Design:
Positive drainage slope to drain shall be minimum 1/8 inch (3mm) per running foot. Spalled areas shall be resurfaced with Vulkem 2300 series Patching Compound.

Hairline cracks less than 1/16 inch (1.5mm) shall be pretreated with a 60 mil (1.5mm) coating of Vulkem 450 six inches (15cm) wide centered over the crack.

Moving structural cracks greater than 1/16 inch (1.5mm) shall be routed out, filled with Vulkem 116 Sealant, stripped with bond breaker tape and coated with a 60 mil (1.5mm) detail coat of Vulkem 450.
Metal:
Metal surfaces shall be clean and free of any rust, dirt and grease. Rusted surfaces must be wire-brushed or sandblasted to bright metal. The use of Vulkem 171 Primer over bare metal is recommended.

APPLICATION
The Vulkem 450/451 System may be applied using roller, squeegee or spray equipment.
Airless spray equipment will give best results and Vulkem 450 may be thinned one quart per five gallons with Xylol or Toluol prior to spraying. Vulkem 451 shall be applied after Vulkem 450 has cured to a rubbery set (24-36 hours at 70°F or 21°C).

Coverage:
Apply Vulkem 450 at 60 mils (1.5mm) thickness, which is 25 square feet per gallon (0.65 square meters/liter). Apply Vulkem 451 at 5 mils (0.1mm) thickness, which is .00 square feet per gallon (10 square meters/liter). Above coverage rate yields a total system thickness of 65 mils (1.6mm).

Limitations:
Vulkem 451 must be applied over Vulum 450 for all exposed applications. Vulkem 450/451 System is not recommended for use over asphalt surfaces.

Use in well ventilated areas. Container contents must be used within 48 hours of opening.

Packaging:
2 gallon pails (7.6 liter), 5 gallon pails (19 liter), 55 gallon drums (208 liter).

Colors:
White, Limestone, Gray

WARRANTY
MAMECO warrants its Vulkem Products to be free of defects in materials, but makes no warranty as to appearance or color. Since methods of application and on site conditions are beyond our control and can affect performance.

MAMECO makes no other warranty, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE with respect to Vulkem Sealants. MAMECO's sole obligation shall be, at its option, to replace, or to refund the purchase price of the quantity of Vulkem Sealant proved to be defective and MAMECO shall not be liable for any loss or damage.

Typical Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Vulkem 450</th>
<th>Vulkem 451</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Gravity</td>
<td>ASTM D1475</td>
<td>1.2</td>
<td>1.06</td>
</tr>
<tr>
<td>Weight per Gallon</td>
<td>ASTM D1475</td>
<td>11 lbs. (5.0Kgs)</td>
<td>8.87 lbs. (4.0Kgs)</td>
</tr>
<tr>
<td>Weight</td>
<td>ASTM D 1353</td>
<td>.33%</td>
<td>79%</td>
</tr>
<tr>
<td>Viscosity, CPS</td>
<td>Brookfield #4 Spindle @ 20 rpm</td>
<td>20,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Flash Point</td>
<td>ASTM D 1310</td>
<td>101°F (38°C)</td>
<td>82°F (28°C)</td>
</tr>
<tr>
<td>Hardness, Shore A</td>
<td>ASTM D 2240</td>
<td>37</td>
<td>80</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>ASTM D 412</td>
<td>200 psi (2.2MPa)</td>
<td>3480 psi (24.0MPa)</td>
</tr>
<tr>
<td>Elongation</td>
<td>ASTM D 412</td>
<td>.50%</td>
<td>250%</td>
</tr>
<tr>
<td>Adhesion to Peel</td>
<td>ASTM D 903</td>
<td>50 in./in. (128N)</td>
<td>100% cohesive to Vulkem 450</td>
</tr>
<tr>
<td>MVT</td>
<td>ASTM E 96, B</td>
<td>1.56 m.p.</td>
<td>.5 m.p.</td>
</tr>
<tr>
<td>Weather Resistance</td>
<td>ASTM D 822</td>
<td>N.A.</td>
<td>Excellent</td>
</tr>
<tr>
<td>Salt Spray</td>
<td>ASTM B 117</td>
<td>N.A.</td>
<td>No Effect</td>
</tr>
<tr>
<td>Abrasion Resistance</td>
<td>ASTM C 501</td>
<td>N.A.</td>
<td>.5 mg loss</td>
</tr>
<tr>
<td>Tear Resistance</td>
<td>ASTM D 1004</td>
<td>.00 pli (889N)</td>
<td>225 pli (1001N)</td>
</tr>
<tr>
<td>Fire Resistance</td>
<td>ASTM E 106</td>
<td>System is rated class A over noncombustible substrate</td>
<td></td>
</tr>
</tbody>
</table>

MAMECO INTERNATIONAL, INC.
4475 East 175th Street • Cleveland, Ohio • 216-3399
Telephone: (216) 753-4400 • (800) 321-6412 • FAX: (216) 752-5005
MOPOXY HB HIGH BUILD Epoxy Coating
40-AW-13, 40-AH-50, 40-AK-103
Polyamide / Epoxy

A two component high performance polyamide epoxy coating which offers high build application characteristics for reduced application costs and improved performance.

For industrial and commercial use as a protective maintenance coating for industrial plants, pulp and paper mills, textiles mills, chemical processing plants, waste water plants, refineries, food processing plants, commercial buildings and marine structures. For coating and protecting storage tanks, piping, roofs and roof decks, water towers, structures, steel, machinery, plant equipment, marine vessels, offshore structures and other surfaces exposed to humidity, chemicals and corrosive environments. Excellent over inorganic zinc-rich coatings and as an intermediate coat under polyurethane finishes. Excellent potable water tank lining system.


Heat resistant to 200°F.

White 40-AW-13; Gray 40-AH-50; Tan 40-AK-103

Semi-gloss

Nonvolatile -
By weight - 65.1 ± 1.0%
By volume - 48.0 ± 1.0%

VOC (Calculated) - 3.55 lbs./gal.
8.29 grams/liter

Flash Point - (A) 77°F; (B) 92°F (Set/flash)

Mixing ratio - 4:1 by volume

Weight per gallon - A) 11.0 ± 0.2 lbs.; B) 7.8 ± 0.2 lbs.

Recommended Film Thickness - 6.0 mils dry, 12.5 mils wet

Theoretical Coverage @ 6.0 mils dry - 128 sq. ft./gal.

Method - Conventional or airless spray.

Thinner - MoPox Y Brushing Thinner 75-35; MoPox Y Spraying Thinner 75-37

Cure time @ 75°F -
To touch - 2 hours
To handle - 8 hours
To recoat - 24 hours

Pot Life @ 75°F - 8 hours minimum.

Induction Time - 30 minutes

Consists of -
Part (A) 40-AW-13 - 1 Gallon Unit 5 Gallon Unit
Part (B) 35-ES-36 - 1 quart (SF) 1 Gallon

Unit Shipping Weight -
(SF) - Short Filled
12 lbs. 59 lbs.

Shelf Life - 12 months minimum from date of manufacture when maintained in protected storage @ 40-100°F (subject to reinspection thereafter).
Physical / Performance Properties

Trade Name: SNOW ROOF®

- Appearance (color): Black, White, Light Grey
- Gloss: 70%
- Sheen: 70%
- Odor: None
- Viscosity: 1000 cp
- Strength: 1000 psf
- Permeability: 1.5 MW/m²
- Specific Gravity: 1.05

HMSI:
- FLAMMABILITY: 1
- HEALTH HAZARD: 0
- SPECIFIC HAZARD: 0

IMPORTANT: Apply a small amount to ensure the product is not reactive.

---

Trade Name: SNOW ROOF® SPRAYABLE GRADE®

- Appearance (color): Medium Black, White, Light Grey
- Gloss: 70%
- Sheen: 70%
- Viscosity: 1000 cp
- Strength: 1000 psf
- Specific Gravity: 1.05

HMSI:
- FLAMMABILITY: 1
- HEALTH HAZARD: 0
- SPECIFIC HAZARD: 0

IMPORTANT: Apply a small amount to ensure the product is not reactive.

Updated - 5/25/95

OREGON RESEARCH & DEVELOPMENT CORPORATION - MANUFACTURERS OF SNOW ROOF SYSTEMS ELASTOMERIC COATINGS
1355 18TH ST. S.E. - SALEM, OR 97302-1456 - (503) 588-7060•TOLL FREE USA (800) 365-0809 • Fax (503) 588-2075

B-13
**Physical / Performance Properties**

**Trade Name: ROOF GUARDIAN®**

- **Appearance (Dry):** Stuccoed Paint Grade
- **Appearance (Asduced):** Thick, Gray
- **Color:** Black, White, Light Gray, Dark Gray, Tan, Chesapeake Brown, Brown, Winter White, Dark Forest Green
- **Masonry Resistance:** Excellent
- **Weight:** Approx. 11 pounds per gallon
- **Solids Content/Volume:** Approx. 34%
- **Solvents:** Water
- **Color:** Gray
- **Permeability:** Less than one part at 20 O.A.
- **Elongation:** 500 to 500
- **Strength:** 15, plus or minus 10 lbs.
- **Shelf Life:** 90 days

- **Flash Point:** 100°F
- **Pour Point:** 95°F
- **Press/Flow Stability Test:** 130°F
- **Ignitability Test:** 110°F
- **HMIS:**
  - **Flammability:** 1
  - **Health Hazard:** 0
  - **Specific Hazard:** 0

**SPECIAL COMMENTS:** Roof Guardian should be applied with Snow Prime or P Pint Seal, on streetside, asap or 90 to 120 day cure. The roost is even associated with Roof Guardian.

**IMPORTANT:** Apply a small amount to ensure the product performs correctly.

---

**Trade Name: KOTE A DECK®**

- **Appearance (Dry):** Stuccoed Paint Grade
- **Appearance (Asduced):** Thick, Gray
- **Color:** Black, White, Light Gray, Dark Gray, Tan, Chesapeake Brown, Brown, Winter White, Dark Forest Green
- **Masonry Resistance:** Excellent
- **L.V. Resistance:** Excellent
- **Weight:** Approx. 11 pounds per gallon
- **Solids Content/Volume:** Approx. 34%
- **Solvents:** Water
- **Color:** Gray
- **Permeability:** Less than one part at 20 O.A.
- **Elongation:** 500 to 500
- **Strength:** 15, plus or minus 10 lbs.
- **Shelf Life:** 90 days

- **Flash Point:** 100°F
- **Pour Point:** 95°F
- **Press/Flow Stability Test:** 130°F
- **Ignitability Test:** 110°F
- **HMIS:**
  - **Flammability:** 1
  - **Health Hazard:** 0
  - **Specific Hazard:** 0

**SPECIAL COMMENTS:** Kote A Deck should be applied directly over existing concrete and should be applied over any wet or dry membranes. The system must be allowed to cure for 7 days before applying the top coat. IMPORTANT: Apply a small amount to ensure the product performs correctly.
**Physical / Performance Properties**

**Trade Name: CLEAR SEALER™**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance Kilocure</td>
<td>Clear Finish</td>
</tr>
<tr>
<td>Appearance (No Hue)</td>
<td>Topcoat Clear Plastic Coating</td>
</tr>
<tr>
<td>L.V. Resistance</td>
<td>Excellent</td>
</tr>
<tr>
<td>Color</td>
<td>Heavy Coating</td>
</tr>
<tr>
<td>Color Change / Volume</td>
<td>25% Plus</td>
</tr>
<tr>
<td>Evaporation</td>
<td>120% to 300%</td>
</tr>
<tr>
<td>Strength</td>
<td>10 - 225 psi</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>123 KPa</td>
</tr>
<tr>
<td>pH of Product</td>
<td>9 - 9</td>
</tr>
<tr>
<td>Relative Density</td>
<td>100</td>
</tr>
<tr>
<td>Freeze / Thaw Stability Test</td>
<td>30% by Volume</td>
</tr>
<tr>
<td>Setting Time</td>
<td>30 min at 70°F, 24 hr at 65-90°F with a slight tack.</td>
</tr>
<tr>
<td>Cure Time</td>
<td>24 hr at 65-90°F or 4 hrs at 90°F.</td>
</tr>
<tr>
<td>Solids (Grav. Vol.)</td>
<td>93% 90%</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>1 year in original container</td>
</tr>
<tr>
<td>Coverage Color</td>
<td>At least 200 square feet per gallon per coat over surface.</td>
</tr>
<tr>
<td>Coverage Rain</td>
<td>At least 150 square feet per gallon per coat over surface.</td>
</tr>
</tbody>
</table>

**Trade Name: WALL SEAL™**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance Kilocure</td>
<td>Acrylic Base, Protective Membrane and Coating</td>
</tr>
<tr>
<td>Appearance (No Hue)</td>
<td>Bright White or Light Gray or Black</td>
</tr>
<tr>
<td>L.V. Resistance</td>
<td>Excellent</td>
</tr>
<tr>
<td>Color</td>
<td>Acrylic, 12.5 - 22.5 lbs/gal.</td>
</tr>
<tr>
<td>Color Change / Volume</td>
<td>34%</td>
</tr>
<tr>
<td>Evaporation</td>
<td>100% Plus</td>
</tr>
<tr>
<td>Strength</td>
<td>245 psig Od, 200 psig Id.</td>
</tr>
<tr>
<td>Water Resistance</td>
<td>1240 psi (60°F)</td>
</tr>
<tr>
<td>Solids (Grav. Vol.)</td>
<td>90% 90%</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>1 year in original container</td>
</tr>
<tr>
<td>Coverage Color</td>
<td>150 sq ft/gal.</td>
</tr>
<tr>
<td>Coverage Rain</td>
<td>150 sq ft/gal.</td>
</tr>
<tr>
<td>Freeze / Thaw Stability Test</td>
<td>30% by Volume</td>
</tr>
<tr>
<td>Setting Time</td>
<td>2 hours at 70°F, 6 hours at 60-90°F or 1 hour at 90°F.</td>
</tr>
<tr>
<td>Cure Time</td>
<td>24 hours at 70°F or 4 hours at 90°F.</td>
</tr>
<tr>
<td>Solids (Grav. Vol.)</td>
<td>90% 90%</td>
</tr>
<tr>
<td>Flash Point</td>
<td>10% 10%</td>
</tr>
<tr>
<td>Minimum Coverage Color</td>
<td>0.00 sq ft/gal.</td>
</tr>
<tr>
<td>Minimum Coverage Rain</td>
<td>0.00 sq ft/gal.</td>
</tr>
</tbody>
</table>

**Important** Always test adhesion on test pieces and on a small portion of surface. Ensure that proper adhesion and drying occur before the performance test is your satisfaction.
Physical / Performance Properties

Trade Name: ELASTO SEAL®

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance / Color</td>
<td>Black</td>
</tr>
<tr>
<td>Top Coat</td>
<td>Black</td>
</tr>
<tr>
<td>Window Resistance</td>
<td>Excellent</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 1.3 lbs / Gallon</td>
</tr>
<tr>
<td>Solids Content / Volume</td>
<td>Approx. 59%</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1000 cps</td>
</tr>
<tr>
<td>Tack 60°</td>
<td>1 1/2 min</td>
</tr>
<tr>
<td>Sag Resistant</td>
<td>4000 psi</td>
</tr>
<tr>
<td>Emissivity</td>
<td>0.85</td>
</tr>
</tbody>
</table>

NOTES: ELASTO SEAL is most suitable for new, metal and coated roofing. Do not bond to waxed surfaces.

Presto / Thaw Stability Test
of Great Materials
At 35° degrees F, ELASTO SEAL will cause 180 degree bend test. ELASTO SEAL will not crack if frozen while in liquid form, may be stored and safely transported before freezing.

Setting Time
15 min. 4 hours at 40°-90° degrees F, and 90% humidity.

Cut Time
At 40° degrees F, 2 to 6 hours. When applying ELASTO SEAL, a slow speed gun is recommended for a slow 15 minute dry time for best adhesion.

Mineral Composition
A special elastomeric polymer based on rubber chemistry.

Tack
Non-tacky after curing.

Flash Point
1500 degrees F (flammable).

Fire Rating
ASTM E-862 Class A - Zero flame spread.

User Health (Leakage)
Less than one.

Coverage Rate
Approx. 150 square feet per gallon per coat.

SPECIAL COMMENTS: Do not mix with water or other ELASTO SEAL. Do not let water into mixture or into product.

APPLICATIONS: For new metal and coated roofing applications. Do not bond to waxed surfaces.

IMPORTANT: Apply a small amount to ensure the product is satisfactory.

---

Trade Name: MOBILE COAT®

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance / Color</td>
<td>Black</td>
</tr>
<tr>
<td>Top Coat</td>
<td>Black</td>
</tr>
<tr>
<td>Window Resistance</td>
<td>Excellent</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 1.3 lbs / Gallon</td>
</tr>
<tr>
<td>Solids Content / Volume</td>
<td>Approx. 59%</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1000 cps</td>
</tr>
<tr>
<td>Tack 60°</td>
<td>1 1/2 min</td>
</tr>
<tr>
<td>Sag Resistant</td>
<td>4000 psi</td>
</tr>
<tr>
<td>Emissivity</td>
<td>0.85</td>
</tr>
</tbody>
</table>

NOTES: MOBILE COAT is most suitable for new, metal and coated roofing. Do not bond to waxed surfaces.

Presto / Thaw Stability Test
of Great Materials
At 35° degrees F, MOBILE COAT will cause 180 degree bend test. MOBILE COAT will not crack if frozen while in liquid form, may be stored and safely transported before freezing.

Setting Time
15 min. 4 hours at 40°-90° degrees F, and 90% humidity.

Cut Time
At 40° degrees F, 2 to 6 hours. When applying MOBILE COAT, a slow speed gun is recommended for a slow 15 minute dry time for best adhesion.

Mineral Composition
A special elastomeric polymer based on rubber chemistry.

Tack
Non-tacky after curing.

Flash Point
1500 degrees F (flammable).

Fire Rating
ASTM E-862 Class A - Zero flame spread. Also, leaves no detectable smoke.

User Health (Leakage)
Less than one.

Coverage Rate
Approx. 150 square feet per gallon per coat.

SPECIAL COMMENTS: MOBILE COAT is a bully emitter and bonding agent. Do not mix with water. Apply MOBILE COAT to new steel roof surfaces and build up slight to full roof before using MOBILE COAT. Use only MOBILE COAT on steel roof surfaces. MOBILE COAT is not recommended for application over water-based or other coatings. For application information, refer to the application guidelines.

IMPORTANT: Apply a small amount to ensure the product is satisfactory.
APPLICATION INSTRUCTIONS

Consult your Mobile Paint Representative for the protective coating system best suited for your requirements.

Limitations: Apply in good weather when air and surface temperature are above 50°F and surface temperature is at least 5°F above the dew point. For optimum application properties, material should be between 70 to 100°F prior to mixing and application. Maintain unmixed material in closed containers in protected storage at 40 - 100°F. A dry film thickness of less than 10 mils will not offer maximum water-proofing protection. Not for use below grade or in areas where ponding water occurs. Allow elastomeric coatings to weather a minimum of one year before applying non-elastomeric coatings. Do not apply solvent base coatings over elastomeric coating. To achieve a waterproof system, the elastomeric film must be free of pinholes, PROTECT FROM FREEZING. FOR EXTERIOR USE ONLY. Do not apply to uncured wood. Do not apply late in the afternoon or when there is a threat of rain or moisture condensing on the uncured coating. Do not apply in direct sun or on hot surfaces.

Surface Preparation: Good surface preparation is essential to a satisfactory coating system. Surfaces to be coated should be clean and dry. Remove all dirt, dust, oil, grease, mildew, rust, loose or cracked paint or other contamination. Remove mildew by scrubbing with a solution of 3 tablespoons of non-ammuniated dry household laundry detergent and 1 quart hypochlorite bleach in 1 gallon of warm water. Protective gloves, clothing and goggles should be worn when using this solution to avoid skin and eye irritation. Quickly wash off any of the solution that touches your skin. After scrubbing, rinse thoroughly with water and allow to dry. Tighten or replace any loose screws or fasteners. Areas where ponding water may occur must be corrected by installing roof drains or other protective measures to eliminate water build up.

Metal Roofs - Remove rust and spot prime with BLP RUS-KIL Rust Inhibiting Primer. All exposed ferrous metals should be primed with RUS-KIL Rust Inhibiting Primer. Remove oils from galvanized metal and allow to weather 90 days. Shingle Roofs - Replace any loose or curling shingles. New shingles should age so that the adhesive tabs have set. urethane Foam - Foam should be coated so as to be installed to prevent deterioration of the surface. Remove any loosely adhering material. Repair cracks with ELASTIC MERIC Patching Cement. Built-Up Roofs - Repair any cracks and blisters with ELASTOMERIC Patching Cement. Blister should be cut open and allowed to dry out completely. Severe blistering may require repair before coating. Concrete - Small cracks should be filled with ELASTOMERIC Patching Cement. Larger cracks and deteriorated areas should be repaired with cement before coating. Chemical compounds, curing agents, surface hardeners, efflorescence or other contaminants should be removed by sand blasting or other effective means.

Previously Painted Surfaces: Repair all damaged areas. Remove loose and badly cracked paint by wire brushing, scraping, sanding or other method to provide a sound surface. Sand smooth all rough areas and feather edge areas of peeled coatings. Remove gloss from previous coatings by sanding. Spot prime all bare areas as in new work above. If doubt exists concerning compatibility of this coating with the previous system, apply coating to a representative area (25 square feet minimum) and allow to cure and age several weeks. Then inspect for adhesion failure, wrinkling, lifting, blistering or any other sign of incompatibility. If there are no signs, coating work can proceed.

Tinting: Pastel colors can be made by the addition of up to 4 ounces of Color Studio colorant per gallon of coating. Special colors can be made to order subject to minimum order. High speed shakers should be avoided when tinting to prevent air entrainment in the coating.

Mixing: This is a one component coating. Always mix thoroughly with a power agitator before application. Do not whip air into coating during mixing.

Thinning: This product is supplied at normal application viscosity and should not require thinning. Thinning is not recommended for proper film build and performance. If thinning is necessary to adjust for unusual conditions thin sparingly with water.

Application: Airless spray is the preferred method of application. Product may be rolled but multiple coats may be required to achieve recommended film thickness. Airless spray application to porous or rough surfaces may require back-rolling to insure that the elastomeric coating contacts and wets out the substrate allowing for proper adhesion and waterproofing characteristics. Apply at 15 miles minimum wet film thickness which will yield 7.5 miles dry film thickness. Two coats are recommended for best performance.


Cleanup: Clean all equipment immediately after use with warm, soapy water. Completely flush all spray equipment with this solution. Occasional flushing of spray equipment during the course of the working day helps prevent buildup and possible clogging. Final flushing of spray equipment with mineral spirits will prevent corrosion. Flush equipment with water prior to application of the product.

Safety: Safe storage, handling and use dictate that adequate health and safety precautions be observed with this product and any recommended thinners. User is specifically directed to consult the current Material Safety Data Sheet for this product as well as precautions contained on product labeling.

Notice: The technical data contained herein are true and accurate to the best of our knowledge. All products are offered and sold subject to Mobile Paint Manufacturing Company’s Standard Conditions of Sale. Published technical data and instructions are subject to change without prior notice.

22DW76(S/92)
TropiCoat
Elastomeric seamless roof coating.

PRODUCT DESCRIPTION
TropiCoat is a 100% acrylic and non-toxic seamless elastomeric roof membrane coating. It is a proven top weather-beater in high-build textured applications. It forms a durable, water-tight, seamless coating. Can be applied to galvanized, aluminum, properly primed steel, iron, cement, wood.

ADHESION
TropiCoat roof coating adheres stubbornly to concrete, asphalt shingles, roofing paper, tile, slate, wood, steel cement, galvanized aluminum (180° peel to ceramic tile. Passos cup test - no cracking or pulling away from cup.)

ELONGATION AND TENSILE STRENGTH
Excellent elongation and tensile strength allows TropiCoat to expand and contract with the surface to which applied without wrinkling or cracking. (Tensile strength: 288 p.s.i.)
(Elongation: 300% @ 70°F.)

RESISTANCE TO PONDOING WATER
TropiCoat offers especially high resistance to ponding water. (3.1 mg / 24 hours / 25cm²).

SETTLING
No settling or separation. No stirring or mixing required

SOLIDS
Percent solids by weight: 71.9%
Volume: 56.0%
Weight per gallon: 13.03 lbs

PERMEABILITY @ 25 MILA DRY
0.72 perms

COVERAGE
On smooth surfaces, 100 sq. ft. per gallon. Two coats are recommended to achieve a dry mil thickness of 19 to 20.

VOC
71 g/l - water

FLAMMABILITY
Low flame spread index (10.7) Federal Specification 0013A.

CLEAN UP
Use warm soapy water. If using an airless, clean with mineral spirits after using water.

SURFACE PREPARATION AND APPLICATION
For maximum adhesion, use a pressure washer (2,000 psi or higher). This will remove any loose dirt, paint, and other contaminants on the surface.

If there is any rust present, wire brush the area and spot prime with a quality rust-inhibitive alkyd paint and allow to dry.

No re-enforcing mesh required when a minimum 25 to 30 mils dry is used otherwise at seams brush a thick coat of TropiCoat flashing and imbed estimator tape in it. Apply a top coating of TropiCoat over that. Allow to dry overnight before applying finish coats.

TropiCoat may be applied with an airless, roller or brush.

Technical Coatings Inc.
P.O. Box 958, Christiansted, St. Croix, USVI 00823
Tel 800-973-2040
Fax 229-773-0970

Manufacturer of superior quality coatings for the industrial, commercial and residential market.

QUESTIONS?
If you have any questions on application or preparation of your roof, you may call the manufacturer direct.
SPECIFICATION DATA

II. STORAGE COATINGS
PRODUCT DATA
MoPoxY HS-50
Epoxy Coating
40-BW-5 / 40-BH-11
Polyamide/Epoxy

A two component high performance polyamide epoxy coating which offers high build application characteristics for reduced application costs and improved performance. NSF approved for potable water tank lining (Standard 61).

For industrial and commercial use as a protective maintenance coating for industrial plants, pulp and paper mills, textiles mills, chemical processing plants, waste water plants, refineries, potable water storage tanks, commercial buildings and marine structures. For coating and protecting storage tanks, piping, roofs and roof decks, potable and fire water storage tanks, structural steel, machinery, plant equipment, marine vessels offshore structures and other surfaces exposed to humidity, chemicals and corrosive environments. Excellent over inorganic zinc-rich coatings and as an intermediate coat under polyurethane finishes.

MoPoxY HS-50 Epoxy Coating offers excellent protection in exposures including moderate to severe industrial and marine environments. Excellent resistance to fresh and salt water, detergents and most chemicals. Very good resistance to fumes and spillage of most organic solvents, acids and alkalies. Excellent abrasion and moisture resistance. Heat resistant to 200°F (dry). NSF approved for potable water tank lining (Standard 61).

White 40-BW-5, Gray 40-BH-11

Semi-gloss

Nonvolatiles - By weight - 69.2 ± 1.0%
By volume - 50.1 ± 1.0%

VOC (Calculated) - 3.40 lbs./gal.
408 grams/liter

Flash Point - (A) 60°F (B) 80°F (Setaflash)

Mixing Ratio - 4:1 by volume

Weight per gallon - (A)12.0 ± 0.2 lbs.;(B)7.3 ± 0.2 lbs.

Recommended Film Thickness - 6.0 mils dry, 12.0 mils wet
Theoretical Coverage @ 6.0 mils dry - 134 sq.ft./gal.
Method - Conventional or airless spray

Thinner - MoPoxY Spraying Thinner 75-37

Cure time @ 75°F - To touch - 2 hours
To handle - 6 hours
To recoat - 24 hours

Pot Life @ 75°F - 8 hours minimum
Induction time - 30 minutes

Consists of -
Part (A) 40BW005, 40BH011
Part (B) 35EF062
Unit Shipping Weight - Short Filled
1 Gallon Unit 5 Gallon Unit
1 Gallon (SF) 5 Gallon (SF)
1 Quart (SF) 1 Gallon
12.5 lbs. 59 lbs.

Shelf Life - 12 months minimum from date of manufacture when maintained in protected storage @ 40-100°F (subject to reinspection thereafter).
1. PRODUCT NAME
THOROSEAL® and THOROSEAL® Foundation Coating

2. MANUFACTURER
Thoro System Products
A Part of ICI Specialties
World Headquarters
7800 NW 38th Street
Miami, FL 33166 (USA)
Phone: (305) 592-2081
FAX: (305) 592-9760

3. PRODUCT DESCRIPTION

Basic Uses: THOROSEAL modified with ACRYL 60® diluted with clean, potable water is used to fill, seal, waterproof and protect a variety of substrates including cast-in-place and pre-cast concrete, brick, common building and split-faced block, stucco, unglazed terra cotta, porous stone, gunite and other masonry substrates. It may be used on interior or exterior, above- or below-grade applications, such as mid-, low- and hi-rise buildings, parking garages, median barriers, bridges, water treatment plants, tunnels, silo exteriors, cooling towers, piers, retaining walls, locks, reservoirs, cisterns, basements and foundations.

THOROSEAL modified with ACRYL 60 is used on vertical, overhead and non-traffic bearing horizontal surfaces where a waterproof, micro-porous (breathing), seamless coating is required. It is highly resistant to standing water, hydrostatic pressure and wind-driven rain and will not soften even when in prolonged contact with standing water. It can be used on new construction or in restoration and renovation applications. Used as an alternative to mechanical finishing or rubbing of concrete, it provides a means to hide minor surface defects and blemishes in architectural concrete. THOROSEAL serves as an ideal base coat for our water-based acrylic emulsion protective top coats, THOROCOAT®, THOROSHEEN® and THOROLASTIC® (exterior only). Use water-based acrylic emulsions for above-grade or below-grade interior only. THOROSEAL gives a low cost, low maintenance, highly durable finish that is resistant to impact damage and abrasion. It does not support fungus growth, is mildew-resistant, contains no lead and is non-toxic when put in contact with potable water. It is non-combustible and will not contribute to flame spread or smoke generation. It has a proven service life in excess of 20 years in tropical, arctic and desert conditions worldwide.

THOROSEAL cures to form a highly alkaline, fully bonded coating. This 3/8" (1.6mm) coating (cured thickness) is equivalent to 1/4" (19mm) of new concrete cover as a barrier to carbon dioxide gas. For steel reinforced concrete, a two coat application will add a significant degree of protection from the deleterious effects of carbonation, effectively returning the carbonation "front" to the coating system surface and adding years of protection to rebar that are still protected by the high alkalinity of the parent concrete. When used on concrete substrates, THOROSEAL modified with ACRYL 60 diluted with clean water is unaffected by the alkalinity of concrete substrates and will not saponify or soften like alkylacids, oils such as linseed or oil-based paints.

THOROSEAL can be used as a base coat and is compatible with loose-laid and certain adhesively bonded liners or membranes as added protection from water entry. Testing for compatibility is recommended prior to full placement.
LIMITATIONS
Do not apply on frost covered masonry or frozen walls, or when temperature falls below 40°F (4.4°C), or is expected to within 24 hrs. Do not dampen walls excessively in fall, winter, or spring months for outside applications. If application is made during exceptionally hot or windy weather, finished surfaces should be fog sprayed several times during the day to prevent too rapid drying.

TEST DATA
Verifed by Independent Test Labs Reports available upon request.
Washington Testing and Engineering Service - Conclusion: Thoroseal Foundation Coating withstands pressure of water in below grade masonry.
Water absorption by boiling (ASTM C67) 3.9% after 5 hours.
Water loss by boiling 0.42% after 5 hours.
Impact resistance (Federal Specification TT-P-0035, para 4.4.3); 24 lbs. passed.
Hardness (Federal Specification TT-P-0035, para 4.4.9 Army - CE); average at 21 days 47.
Minimum required 30, maximum 60, passed.
Compliances: FHA Minimum Property Standards.

COVERAGE
270 sq. ft. per 60 lbs. at 2 lbs. per sq. yd. (25 m² per 27.2 kg at 1 kg/m²). Coverage figures are approximate. Sufficient material must be applied to completely fill and seal all holes, pores and voids.

PACKAGING
50 lb. (22.7 kg) sack and 60 lb. (27.2 kg) pails.

WARRANTY
Thor System Products warrants that this product conforms to its applicable current specifications. Otherwise, Thor System Products makes NO OTHER WARRANTIES EXPRESS OR IMPLIED WITH RESPECT TO THE PRODUCTS COVERED BY THIS WARRANTY AND SPECIFICALLY DISCLAIMS THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. Thor System Products also disclaims for incidental or consequential damages, including lost profits, arising from a breach of this warranty.
In certain jurisdictions or countries, products of Thor System Products may be eligible for extended warranties. Contact Thor System Products for eligibility details. Approval prior to application is required.
base coat of THOROSEAL can provide additional below-grade waterproofing protection and make it easier to isolate leaks due to membrane failure or damage.

THOROSEAL is a barrier layer that will provide protection against the deleterious effects of acid rain, nitrous oxide and chlorides (salt spray). It is easily cleaned with soap and water. THOROSEAL can, by keeping it dry, significantly reduce the thermal conductance of concrete or masonry and help it maintain its stated R-values. The THOROSEAL application does not usually change the location of the dewpoint in a wall assembly. However, the addition of insulation can change the location of the dewpoint in a wall assembly; therefore, vapor barriers may be necessary in certain assemblies. Calculations should be carried out for each individual project. THOROSEAL has been shown to act as a barrier to the infiltration of radon gas. This suggests that THOROSEAL can be used on below-ground structures as a barrier coating in conjunction with other radon abatement systems. Contact Thoro System Products for further technical details.

**Composition and Materials:** THOROSEAL is a batch-blended powder formulation. All ingredients are checked against rigid specifications before the production of each batch of material. After the blending process, each batch is laboratory tested before being packaged. This process ensures precision and the uniformity of each batch. THOROSEAL is a blend of hydraulic cements, lime, pigments, plasticizers, dispersants and high specification aggregates. The aggregates meet exacting standards for size, purity and hardness and ensure that the cured THOROSEAL coating has a dense interlocking matrix with exceptional physical properties. When mixed with ACRYL 60, an

### 4. TECHNICAL DATA

<table>
<thead>
<tr>
<th>PHYSICAL or PERFORMANCE PROPERTY</th>
<th>TEST METHOD</th>
<th>RESULT (AVERAGES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Compressive Strength</td>
<td>ASTM C 109-80</td>
<td>7 days = 4200 psi (29 N/mm²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 days = 6030 psi (42N/mm²)</td>
</tr>
<tr>
<td>2. Flexural Strength</td>
<td>ASTM C 348-80</td>
<td>7 days = 360 psi (2.5 N/mm²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 days = 1027 psi (7 N/mm²)</td>
</tr>
<tr>
<td>3. Tensile Strength</td>
<td>ASTM C 190-77</td>
<td>7 days = 250 psi (2 N/mm²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 days = 440 psi (3 N/mm²)</td>
</tr>
<tr>
<td>4. Modulus of Elasticity</td>
<td>ASTM C 469</td>
<td>28 days = 2.72 x 10⁴ psi (192 N/mm²)</td>
</tr>
<tr>
<td>5. Coefficient of Thermal Exp.</td>
<td>ASTM C 531</td>
<td>28 days = 6.59 x 10⁻⁶ in³/ft³ (5 x 10⁻⁷ mm³/mm²)</td>
</tr>
<tr>
<td>6. Accelerated Weathering</td>
<td>ASTM C 26-77 (Xenon Arc)</td>
<td>5000 hours = No failure</td>
</tr>
<tr>
<td></td>
<td>ASTM C 23-77 (Carbon Arc)</td>
<td>500 hours = No failure</td>
</tr>
<tr>
<td>7. Impact Strength (Gardner Impact Tester)</td>
<td>Fed. Spec. TT-P-0035 (Cement Paints para 3.4.8)</td>
<td>No chipping</td>
</tr>
<tr>
<td>(para 4.4.7)</td>
<td></td>
<td>8 hours = excellent</td>
</tr>
<tr>
<td>8. Wind Driven Rain</td>
<td>Atlas Type DMC</td>
<td>No cracking, loss of adhesion, checking or other defect</td>
</tr>
<tr>
<td>9. Accelerated Weathering</td>
<td>Weatherometer</td>
<td>7 days = 35</td>
</tr>
<tr>
<td>10. Hardness (Barber Coleman Impresor)</td>
<td>Fed. Spec. TT-P-0035 (para 4.4.9)</td>
<td>14 days = 47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 days = 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>requirement min. = 30, max. = 60</td>
</tr>
<tr>
<td>11. Fungus Resistance</td>
<td>Fed. Spec. TT-P-298</td>
<td>21 days = No growth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>meets all requirements</td>
</tr>
<tr>
<td>12. Abrasion Resistance</td>
<td>Fed. Spec. TT-P-141b</td>
<td>3000 litre sand = Passed</td>
</tr>
<tr>
<td>13a. Surface Burning Characteristics</td>
<td>ASTM E 84-86</td>
<td>Flame Spread 0</td>
</tr>
<tr>
<td>13c. Flame Spread</td>
<td>BS476:Part 7:1971 (British Standard)</td>
<td>Index = 1.5</td>
</tr>
<tr>
<td>14. Permeance</td>
<td>ASTM E 96 (Water Vapor Transmission)</td>
<td>Class 1</td>
</tr>
<tr>
<td></td>
<td>Swedish Standard</td>
<td>Perms = 12</td>
</tr>
<tr>
<td></td>
<td>SS-02-15-82</td>
<td>Metric Permeability = 0.10698</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 x 10⁻² resistance</td>
</tr>
<tr>
<td>15. Freeze/Thaw Resistance</td>
<td>ASTM C 666 (Procedure B)</td>
<td>200 cycles = No change</td>
</tr>
<tr>
<td>16. Water Absorption</td>
<td>ASTM C 67 (Section 7.3)</td>
<td>Boiling water submersion at 24 hours = 3.6%</td>
</tr>
<tr>
<td>17. Reflectance</td>
<td>ASTM D 2244 Using Hunterlab D-25 Meter</td>
<td>GREY THOROSEAL: 64.2</td>
</tr>
<tr>
<td>18. Salt Spray Resistance</td>
<td>ASTM B 117</td>
<td>WHITE THOROSEAL: 88.1</td>
</tr>
<tr>
<td>19. Adhesion Strength</td>
<td>Test by Tensile Bond</td>
<td>300 hours = No defect</td>
</tr>
<tr>
<td>20. Initial Set</td>
<td>Lab Value</td>
<td>418 psi (2.9 N/mm²)</td>
</tr>
<tr>
<td>21. Final Set</td>
<td>Lab Value</td>
<td>10 minutes at 70°F (21°C), 50% RH</td>
</tr>
<tr>
<td>22. Shelf Life</td>
<td>Lab Value</td>
<td>90 minutes at 70°F (21°C), 50%RH</td>
</tr>
<tr>
<td>23. Density (Cured)</td>
<td>Lab Value</td>
<td>Bags = 6 months</td>
</tr>
<tr>
<td>24. Potable Water (Direct Contact)</td>
<td>BS6920 (British Standard)</td>
<td>Pail = 12 months</td>
</tr>
<tr>
<td>25. Carbon Dioxide (CO₂)</td>
<td>Lab Value</td>
<td>129 lbs/cu ft (2060 kg/m³)</td>
</tr>
<tr>
<td></td>
<td>Diffusion</td>
<td>Suitable</td>
</tr>
</tbody>
</table>

\[\frac{1}{4}" (1.6mm)\] Equivalent to \(\frac{3}{16}\" (19mm) new concrete
### Chemical Resistance

<table>
<thead>
<tr>
<th>REAGENT</th>
<th>EXPOSURE PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap Water</td>
<td>35 days</td>
</tr>
<tr>
<td>Dissolved Methane Gas</td>
<td>35 days</td>
</tr>
<tr>
<td>20% Sulfuric Acid</td>
<td>15 days</td>
</tr>
<tr>
<td>Blood</td>
<td>35 days</td>
</tr>
<tr>
<td>Citric Acid</td>
<td>15 days</td>
</tr>
<tr>
<td>White Wine</td>
<td>15 days</td>
</tr>
<tr>
<td>Milk</td>
<td>15 days</td>
</tr>
<tr>
<td>Ammonia</td>
<td>15 days</td>
</tr>
<tr>
<td>Raw Sewage</td>
<td>35 days</td>
</tr>
</tbody>
</table>

Resistance to Hydrostatic Pressure (Air Cured, 70°F [21°C], 50% RH)

### Conductance Results for “k” Values

<table>
<thead>
<tr>
<th>SUBSTRATE</th>
<th>UNCOATED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wet Condition</td>
</tr>
<tr>
<td>Concrete</td>
<td>25</td>
</tr>
<tr>
<td>Expanded Shale Block</td>
<td>11</td>
</tr>
<tr>
<td>Pumice Block</td>
<td>5.5</td>
</tr>
</tbody>
</table>

### Coating Integrity

<table>
<thead>
<tr>
<th></th>
<th>Unaffected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong Attack</td>
<td>Surface Stain</td>
</tr>
<tr>
<td>Unaffected—Light Stain</td>
<td>Strong Attack</td>
</tr>
<tr>
<td>Unaffected—Light Stain</td>
<td>Unaffected</td>
</tr>
</tbody>
</table>

### Positive Pressure

- 752 hours at 200 psi (1.4N/mm²)
- (461 head H) 3 No Leakage, No Softening

### Negative Pressure

- 664 hours at 200 psi (1.4N/mm²) 3 Limited Dampness

### Approvals:

Federal Highway Authority for Coatings used in Lieu of Rubbing Concrete—Approved

<table>
<thead>
<tr>
<th>AGENCY</th>
<th>REPORT NUMBER</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alabama Highway Dept.</td>
<td>Spec. Section 501.03(L)13C</td>
<td>March 1986</td>
</tr>
<tr>
<td>3. Iowa State Highway Commission</td>
<td>#27</td>
<td>October 1969</td>
</tr>
<tr>
<td>8. New Mexico Highway D.O.T.</td>
<td></td>
<td>May 1974</td>
</tr>
<tr>
<td>10. State of Rhode Island</td>
<td></td>
<td>February 1982</td>
</tr>
<tr>
<td>11. South Carolina, Dept. of Highways</td>
<td></td>
<td>April 1981</td>
</tr>
<tr>
<td>13. West Virginia, Dept. of Highways</td>
<td></td>
<td>June 1988</td>
</tr>
<tr>
<td>17. NSF Rule 61</td>
<td>Pending</td>
<td></td>
</tr>
<tr>
<td>18. Potable Water (Direct Contact)</td>
<td>Approved for Cold Water</td>
<td></td>
</tr>
</tbody>
</table>

### Integral Acrylic Polymer Emulsion

Admixture, diluted with water, THOROSEAL becomes a thick, viscous suspension from which the solid matter will not segregate or settle out. Once activated by the mixing liquid, the THOROSEAL undergoes hydration and cures to a hammer-hard protective and waterproof barrier. ACRYL 60 forms a film around all the particles in the THOROSEAL powder. It aids the curing process and reduces the stresses on the bond line. It also increases the flexural and tensile strengths of the cured coating which increases its durability and performance.

THOROSEAL contains Portland cement. Care should be taken when handling, mixing or finishing to protect eyes, skin and respiratory systems. Use appropriate protective equipment and clothing that meets the most current ANSI 287 Standards.

THOROSEAL Foundation Coating contains identical ingredients to THOROSEAL; however, it is blended with cements and aggregates which may not be of uniform color, hence, the hydrated or cured material can be variable in color. It performs identically to THOROSEAL when used for exterior below-grade applications. Refer to technical bulletin 24.

### Containers

THOROSEAL is packaged in 30 lb. (13.6 kg) and 50 lb. (22.7 kg) polyethylene-lined bags and 60 lb. (27.2 kg) rubber-gasketed metal pails.

ACRYL 60 is packaged in 1 qt. (.04 l), 1 gal. (3.7 l) bottles and 5 gal. (18.9 l), 30 gal. (116 l), and 55 gal. (213 l) plastic pails.

THOROSEAL Foundation Coating is packaged in 50 lb. (22.7 kg) polyethylene lined bags and 60 lb. (27.2 kg) rubber-gasketed metal pails.

### Colors

THOROSEAL is available in white, standard gray, pearl gray and 10 stock colors. THOROSEAL Foundation Coating is available in gray only. This product is not color uniform.
**Safety, Health and Environmental Recommendations:** Appropriate eye protection meeting the most current ANSI Z87 Standards should be worn when mixing or applying and during surface preparation. Refer to Thoro's Material Safety Data Sheet for additional information.

**Limitations:** Do not apply to surfaces that are not clean and completely free from any contaminants. Previously painted surfaces must be prepared such that virtually all existing paint films are removed.

If the substrate or ground water contains sulfates or nitrates, special application techniques and protective topcoats may be necessary.

Protect areas and surfaces such as metal, glass and wood, which must not be coated with suitable protective materials such as tape or paper.

Avoid application to substrates that have active water leakage. Relieve hydrostatic pressure by the use of weep holes. Patch all static cracks and joints with WATERPLUG® hydraulic cement first. All dynamic (moving) cracks or joints should be identified and treated appropriately.

Do not apply THOROSEAL in rain or when rain is expected before initial set has taken place.

Do not apply THOROSEAL to frozen surfaces or when the temperature is below 40°F (4.4°C) or expected to fall below 40°F (4.4°C) within 24 hours.

To ensure full and proper curing, adequate ventilation must be provided when applying THOROSEAL in enclosed areas such as tunnels or reservoirs.

Some water can be aggressive toward concrete substrates, and these waters may be harmful to THOROSEAL. When dealing with water-retaining structures, it is recommended that tests be carried out to determine water quality before drawing up a project specification.

Very soft water or sea water has the same effect on THOROSEAL as an acid. Avoid all environments such as tank interiors or cooling tower interiors where very soft water is used. Maintain appropriate water hardness (less than 140 ppm and above 7.2 pH) to avoid damage to a THOROSEAL appli-
ked must be unsaturated and sur-
face dry before beginning
application. The surface glaze on
tiles or other very dense sub-
strates will require mechanical
abrasion or acid etching to gain
proper adhesion. Great care must
take when using acid-etching or
chemical cleaning methods to
ensure complete neutralization
and removal of the chemicals and
salts before coating commences.

If the surface has a previous coat
of THOROSEAL, this need not be
removed if it is well bonded. The
surface of the THOROSEAL must;
however, be totally clean. If the
substrate has been previously
painted, virtually all of the ex-
isting paint film must be re-
moved. Any paint residue must
not be larger than ½” (12mm) in
diameter. All mortar joints should
be in sound condition and tooled.
All static cracks or breaks, voids
or honeycombing larger than ½”
(0.8mm) should be cut out and
repaired with WATERPLUG or a
THORITE/ACRYL 60 mixture. Form
ties and other metal fragments
must be removed and the sub-
strate patched with a THORITE/
ACRYL 60 mixture. All free surface
water must be drained. Weep
holes are required to drain walls
before coating commences. Refer
to Waterplug, Thorite and
Thorite 200 Tech Bulletins 14, 20
and 20.1, respectively.

After the THOROSEAL has fully
cured, all dynamic cracks should
be routed out and filled with an
appropriate sealant per the seal-
ant manufacturer's printed direc-
tions.

Thru-wall penetrations should
be fully encased in WATERPLUG
before THOROSEAL is applied.
Chisel or bore out an annular
space around all thru-wall pen-
etrations and apply an approved
sealant between the penetration
and the substrate per the sealant
manufacturer's printed direc-
tions. Allow sealant to cure. Fill
remaining annular space with
WATERPLUG. All thru-wall pipes
or elements should be properly
prepared and precoated with a
protective coating prior to appli-
cation of WATERPLUG to avoid
corrosion. Do not embed alu-
minum in steel-reinforced con-
crete which can cause dissimilar
metal corrosion. For exposure to
high hydrostatic pressure envi-
ronments, use WATERPLUG in
both exterior and interior annular
spaces.

Several documents on cleaning
and testing concrete have been
published by the American So-
ciety of Testing and Materials
(ASTM) and are listed below:
• ASTM D 4259-83 Practice for
  Surface Cleaning Concrete for
  Coating
• ASTM D 4259-88 Practice for
  Ablarding Concrete
• ASTM D 4260 Practice for Acid-
  Etching Concrete
• ASTM D 4261 Practice for Sur-
  face Cleaning Concrete Unit
  Masonry for Coating
• ASTM D 4262-83 Test Method
  for pH of Chemically Cleaned or
  Etched Concrete Surfaces
• ASTM D 4541 Standard Method
  for Pull Off Strength of Coatings
  Using Portable Adhesion Testers

**Bond Test:** New concrete should
have gained sufficient strength
for it to support a THOROSEAL
application without damage or
delamination. The time interval
necessary to achieve this condi-
tion will vary greatly and is de-
pendent on concrete quality and
curing conditions. As a guide, this
curing is likely to be 2 to 14 days.

If any doubt exists about the
suitability of the substrate to re-
ceive THOROSEAL, then a bond
test should be carried out. Clean
and prepare the area or areas that
are representative of the full site
to be coated. Mix and apply
THOROSEAL according to the
labeled instructions. Allow to
cure for at least two days. Using
a hammer and chisel, attempt to
remove the coating. If the coating
cannot be readily removed with-
out damage to itself and the sub-
strate, then a full application
should be possible. If the coating
delaminates cleanly from the sub-
strate, there may be clear con-
taminants in or on the substrate
(such as clear sealers, silicones,
form release agents, etc.). If the
coating delaminates with sub-
strate adhered, then the substrate
may be weak or friable. In either
case special cleaning and/or ap-
lication techniques will be ne-
cessary (consult Thoro System
Products Regional Technical Ser-
vices department). To specify a
minimum numerical value for ad-
hesion, use a tensile bond value
of 300 psi (2.1N/mm²). For ques-
tionable surfaces, consult Thoro
System Products Regional Tech-
ical Services department.

**Mixing:** THOROSEAL powder
may be mixed by hand or by using
a power mixer fitted with a
THORO E-Z mixing paddle at 400
to 600 rpm. Power mixing is al-
ways preferable. Larger mixers
are capable of mixing 2 to 3 bags
per minute. This volume mixing is
required to attain maximum ef-
iciency of the high volume spray
pumps.

THOROSEAL powder is mixed
using a solution consisting of
ACRYL 60 diluted with water,
usually 1 part ACRYL 60 to 3 parts
clean water. For stronger bonding capa-
bility on dense or questionable
surfaces or to significantly improve
the flexural and tensile strengths of
the cured THOROSEAL, reduce di-
lution to 1:2, 1:1 or 2:1 (2 parts
ACRYL 60 to 1 part water). Mix one
50 lb. (22.7 kg) bag with approxi-
mately 6-8 qts. (5.6 to 7.5 l) of mix-
ing liquid, adding powder to liquid.
Volume of mixing liquid is depen-
dent on the ambient tem-
perature, method of application,
relative humidity and the charac-
teristics of the spray pump. At a
1:3 dilution ratio each 50 lb. (22.7
kg) bag of THOROSEAL will re-
quire approximately 1.5 qts. (1.4 l)
of ACRYL 60 and 4.5 qts. (4.2 l)
of water. At a 1:2 dilution ratio use 2
qts. (1.8 l) of ACRYL 60 and 4 qts.
(3.7 l) of water. At a 1:1 dilution
ratio use 3 qts. (2.8 l) of ACRYL
60 and 3 qts. (2.8 l) of water.

When properly blended, the
THOROSEAL will have the con-
sistency of smooth, heavy batter.
The mixed THOROSEAL/ACRYL 60
should be allowed to rest undis-
turbed for a minimum of 10 min-
utes to fully wet out all the
powder. The wet mix should then
be remixed and applied. A small
amount of mixing liquid can be
added to this remixing.

Once remixed, a batch can be
remixed (or retempered) one ad-
ditional time. Pot life is between
40 to 60 minutes at 70°F (21°C).
At high temperatures and low rela-
tive humidity, pot life can be sig-
nificantly less.

**Application:** THOROSEAL may
be applied by spray, tampico fiber
brush or 10" Thoro broom. Spray
application is recommended for
large projects generally using a
plasterer's type spray gun, a dia-
Spray application is the most cost-effective application method to use and significantly reduces the in-place cost. Spray rates of 10 to 15 lbs per minute are possible depending on equipment used, staging and crew experience. These spray rates are equivalent to 450 to 900 sq. ft. (41.8 to 83.7 m²) of coverage per minute. THOROSEAL cannot be applied by roller or airless spray equipment.

Generally brooming the THOROSEAL after spraying (called backbrooming) will impart a slight texture to the basecoat and help to achieve uniformity of thickness and texture.

The substrate must be completely dampened before application starts. A damp surface will prevent surface drag on the material; keep the substrate cool and eliminate flash setting.

It is essential that the first coat is well brushed into the substrate even if the application is by spray-gun. Lay the material on the substrate, filling all pores and voids. Finish the coat with smooth horizontal strokes. Allow to cure for 24 hours or overnight before applying second coat. On block or masonry walls, allow 5 to 7 days before applying second coat to eliminate joint read through. Always broom the second coat with vertical strokes to insure easy cleanability.

After this second coat has hardened, any weep holes should be plugged using WATERPLUG and then overcoated with THOROSEAL.

Recommendations on the types of spray gun to be used to place THOROSEAL are available from Thoro System Products.

Specific Applications:
• For above-grade interior or exterior applications in positive pressure situations, (direct contact with rain or standing water with a low head of pressure), a 50 lb. (22.7 kg) bag of THOROSEAL will provide the following coverage at the designated material usage.

Recommended Coverage: First Coat—2 lbs. per sq. yd. (0.9 kg/83 m²) = 225 ft² per 50 lb. bag at ½" (1.6 mm) cured thickness. Second Coat—1 lb. per sq. yd. = 450 ft² per 50 lb. bag at ½" (0.8 mm) cured thickness. Total 3 lbs. per sq. yd., cured thickness ¾" (2.3 mm).

Coverage will vary depending on surface texture and porosity. A 3 lbs. per sq. yd. application rate does not eliminate surface irregularities such as struck mortar joints. To hide surface irregularities, a base coat of THOROSEAL at 2 lbs. per sq. yd. should be used and allowed to cure for 5 to 7 days. This should then be overlaid with a top coat of sprayed and back troweled THOROSEAL Plaster Mix at an application rate of 9 lbs. per sq. yd.

• For below-grade interior applications the standard application is 3 lbs. per sq. yd. For high hydrostatic pressure conditions (over 15 psi), increase application rate to 4 lbs. per sq. yd. Waterproof from the positive side wherever possible.

• For below-grade exterior applications, use THOROSEAL Foundation Coating. For high hydrostatic pressure conditions (over 15 psi), apply a base coat of THOROSEAL Foundation Coating at 2 lbs. per sq. yd. and allow to cure for 5 to 7 days. Then apply a top coat of THOROSEAL Plaster Mix at 12 lbs. per sq. yd. A steel trowel finish is recommended.

For both below-grade interior and below-grade exterior applications it is recommended to cut out and place a WATERPLUG cove at the wall/floor junction prior to the application of the THOROSEAL base coat.

• For applications in tunnels, reservoirs, dams, etc. where high hydrostatic pressure is encountered, consult Thoro System Products for application recommendations.

• THOROSEAL can be covered with extruded polystyrene insulation board for below-grade applications. The board must be fully coated with THOROSEAL and embedded into the still-wet coating already in place on the walls. Care must be exercised when placing the coated board since moving or sliding of the board is not possible. Once placed, do not move the board. After curing, the above-grade portion of the boards can be prepared by roughening or removal of the surface skin and then coating with THOROSEAL to protect them from U.V. light degradation for exterior exposures.

• Expansion or control joints must be maintained or placed as necessary in a structure to which THOROSEAL is to be applied. After the THOROSEAL has cured, these joints can be filled with an appropriate caulk or sealant.

• For waterproofing potable water tanks or reservoirs, completely wash down the fully cured THOROSEAL with saline solution (salt brine, 12.5% salts in water). Leave saline solution on the entire THOROSEAL surface for at least 24 hours. Rinse off saline solution completely. If needed, reapply saline solution until final rinse water is completely clear and clean.

Finish: A brush, spray textured or smooth sand finish can be achieved with THOROSEAL. For below-grade interior substrates or where a smoother surface texture is required, THOROSEAL can be topcoated with SUPER QUICKSEAL®. SUPER QUICKSEAL contains only ultra-fine constituents and can be applied by spray or brush. Refer to technical bulletin 15 or Tech Data unit 15-TD for further details.

Temperature: THOROSEAL should be applied when the ambient temperature is at least 40°F (4.4°C) and expected to remain so until initial set of the material is achieved. Do not apply to frozen or frost-filled substrates. If the weather is windy and/or hot and/or dry then the application should be frequently misted with water to prevent early dry-out.

Cold Weather Application: In cold weather the THOROSEAL application must be protected from cold or freezing until cured a minimum of 24 hours. The use of heated enclosures or heat blankets is recommended. Suggested heating devices are hot-air type units with the exhaust vented outside the enclosure. Avoid salamanders or heaters that emit oil residues or unburned hydrocarbons into the enclosure. All THOROSEAL powder, mixing water and ACRYL 60 should be stored in a heated area and should be conditioned to 70°F to 70°F (10° to 21°C) prior to mixing and placement. Heated enclosures should be kept heated until THOROSEAL is fully cured.
Hot Weather Application: In extremely hot weather, the materials, application equipment and substrates should be protected from direct sunlight and wind. Condition all powder, mixing water and ACRYL 60 to 50 to 70°F (10 to 21°C). Frequent water misting of the substrate will significantly lower its temperature due to evaporative cooling. Ice can be added to the mixing water. All ice must be completely melted prior to mixing the water and the ACRYL 60. In extremely hot conditions keep ice in plastic bags in the diluted mixture.

Application equipment including pumps, mixers, hose lines, spray wands, etc. should be kept covered or frequently cooled with water spray. In extremely hot, windy, arid environments, night application may prove the most effective.

Applied THOROSEAL should be protected from hot, drying winds by the use of 6 mil polyethylene enclosures or barriers. Such enclosures should be vented to keep interior temperatures as low as possible.

Under hot weather conditions, apply THOROSEAL during the coolest part of the day.

Color Uniformity: With any cementitious products, such as THOROSEAL, which undergo hydration, it is difficult to achieve color uniformity due to weather and substrate variability. For this reason it may be necessary to specify a colored topcoat of THOROCOAT, THOROLASTIC (exterior above-grade use only), or THOROSHIELD. A 2 lb. per sq. yd. base coat application of THOROSEAL followed by a color coat of one of the above will provide protection from wind-driven rain. THOROSEAL, THOROCOAT or THOROSHIELD can also be top-coated with clear THOROGLAZE, THOROGLAZEN or THOROSHIELD for added protection from staining, acid rain or atmospheric particulates. Refer to Tech Bulletins 26, 27 and 28, respectively.

Site Sample: On all projects, it is recommended that a sample panel be prepared on site and approved prior to the commencement of the work. The sample should act as a site example of the color, texture and workmanship required until the job is finished and accepted. Retain the sample until final approval is secured.

DANGER! INJURIOUS TO EYES. CAUSES SKIN IRRITATION. CONTAINS CEMENT, LIME AND CRYSSTALLINE SILICA (SAND). Avoid eye contact. Avoid prolonged contact with skin. Wash thoroughly after handling. In case of eye contact, flush with copious amounts of water. If irritation persists, contact a physician. Goggles and gloves are recommended when using this product. There is limited evidence to suggest that crystalline silica may cause cancer in humans. Use local exhaust ventilation to keep exposure to a minimum. Where overexposure to this material is suspected, use a NIOSH/MSHA approved respirator for dusts. Refer to MSDS for handling instructions and additional information on this product. For help in chemical emergencies involving spill, leak, fire, or exposure, call toll-free CHEMTREC at 1-800-424-9300 DAY OR NIGHT. KEEP OUT OF REACH OF CHILDREN.

HMIS RATINGS
Health ........................ 1
Flamability ................. 0
Reactivity .................. 0
Personal Protection ....... X

NEW JERSEY RIGHT TO KNOW
Portland Cement 65997-15-1
Silicon Dioxide 14808-60-7
Calcium Hydroxide 1205-62-0

6. AVAILABILITY AND COST
THOROSEAL and all allied Thoro Products are available through a network of dealers and distributors throughout the world. Virtually all major metropolitan areas are serviced. In-place costs will vary depending on the size of the project, surface preparation and labor cost factors. Contact a local applicator for a cost estimate or contact the nearest Thoro System Products' Regional Office. Thoro System Products maintains a worldwide list of projects on which THOROSEAL modified with ACRYL 60 have been used. This list contains thousands of projects. Contact Thoro System Products for a reference for the particular type of structure or substrate required for the project.

7. WARRANTY
Commitment to Quality: Thoro System Products is dedicated to providing quality, value-added products and services. As a group and as individuals, Thoro System Products is striving to improve the quality of Thoro's activities and to do them correctly the first time. Thoro System Products welcomes input from customers and suppliers.

ICI Americas, Inc. warrants that this product conforms to its applicable current specifications. Otherwise ICI Americas, Inc. makes NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. The responsibility of ICI Americas, Inc. for claims arising out of breach of warranty, negligence, strict liability or otherwise is limited, at ICI Americas, Inc.'s option to replacement of defective materials or refund of the purchase price for defective materials. IN NO EVENT SHALL ICI AMERICAS BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS.

In certain jurisdictions or countries, products of Thoro System Products may be eligible for extended warranties for material only and material and labor for periods of up to ten years on projects with qualifying specifications. Prior approval, site inspections and a specification review are required for warranty eligibility. For further information contact Thoro System Products. APPROVAL PRIOR TO COATING APPLICATION IS REQUIRED.

8. MAINTENANCE
No special maintenance program is necessary to ensure that a THOROSEAL application remains waterproof and well adhered for many years. Occasional cleaning with soap and water of above-grade exposure will generally restore the coating to its original appearance. Flexible expansion and sealants joints should be in-
spected regularly to ensure their integrity as part of a waterproofing system.

9. TECHNICAL SERVICES

Thoros sales and technical staff are available worldwide to assist in job-site evaluations, equipment recommendations, specification writing, contractor training, job followups and warranty issuance. Contact a local or any office of Thoros System Products for any information or assistance required.

Thoros offices:
World Headquarters
Thoros System Products
(The Americas, including Canada and Mexico, the Caribbean and Pacific Rim Countries)
7800 NW 38th Street
Miami, FL 33166 (USA)
Phone: (305) 597-8100
FAX: (305) 592-9760

Eastern Regional Office
Route 13 at Beaver Dam Road
Bristol, PA 19007 (USA)
Phone: (215) 946-2350
(800) 277-8410 (National)
FAX: (215) 945-4368

Central Regional Office
8401 73 Avenue North, Suite E2
Brooklyn Park, MN 55428 (USA)
Phone: (612) 533-3103
FAX: (612) 533-0244

Western Regional Office
39366 Fremont Boulevard
Fremont, CA 94538 (USA)
Phone: (415) 796-3773
(800) 445-6182 (National)
FAX: (415) 796-0204

European Headquarters
(Scandinavia, Middle East, Germany and rest of Europe)
Thoro N.V.
Berkenbossenlaan 6
B-2400 Mol, Belgium
Phone: 014-81-12-71
FAX: 014-81-32-10

Thoros System Products, Ltd
19 Broad Ground Road
Lakeside Redditch
Worcestershire B98 8YP
United Kingdom
Phone: 0527-517-989
FAX: 0527-510-299

Thoros S.A.R.L.
45, Avenue de L’Europe
B.P. 34
78142 Velizy Villacoublay Cedex
Paris, France
Phone: 30-70-29-50
FAX: 30-70-29-51

Thoros System Products S.P.A.
Via F. Ili Rosselli, 10
20068 Canzo Di Peschiera
Borromeo
Milan, Italy
Phone: 02-55-30-14-19
FAX: 02-55-30-14-99

10. FILING SYSTEMS

Electronic SPEC-DATA®
SPEC-DATA® II
Sweet’s Catalog
Waterproof, cement-base coating for exterior below grade concrete and masonry.

DESCRIPTION
Thoroseal Foundation Coating is specifically designed to waterproof the exterior surface of concrete and masonry below grade. Normally applied with a "Thor Push Broom" or Thoroseal 5" (15.2 cm) Beaver Brush, it can also be mixed with clean washed sand and applied as a superior waterproofing parging (trowel applied) coating. Thoroseal Foundation Coating is not intended as a decorative finish coat.

USES
To waterproof foundations below grade or waterproof back coating between face brick and back-up units.

SURFACE PREPARATION
Surface to be coated must be clean and structurally sound. Remove all dirt, grease, oils, efflorescence, form treatments, mineral salts, form oil, latex, film type curing agents, etc. Clean mortar droppings from top of footer. Form cove at this point with Thoroseal Foundation Coating mixed to a mortar consistency. Point and fill all broken corners of block and breaks in surface. Cut the wires back at least 1/4" (1.9 cm) and patch with Thoroseal or Waterplug. Anchor in place with Waterplug all pipes, etc. that pierce foundation walls.

MIXING
Pour dry material into mixing container or mortar box, round out center and gradually add clean water to bring to consistency of heavy batter (approximately 2 gallons of water per 60 lbs. [7.5 liters per 27.2 kg]). To improve coating on smooth or dense concrete and masonry and for all trowel applications, prepare a mixing liquid consisting of 1 part Acryl 60 to 3 parts of clean water. When power mixing, add material to the water. Stir for 10-15 minutes soaking time to attain mix and disperse waterproofing elements for a uniform batch. When ready to apply, a small amount of water may be added if necessary to bring mix to proper consistency. Make sure all powder at bottom of container has been thoroughly mixed to secure a smooth batch. Stir just before placing. Thoroseal Foundation Coating sets slowly so that enough can be prepared to last for two hours under normal conditions.

APPLICATION
Thoroughly caisson masonry or concrete surface before applying Thoroseal Foundation Coating. Do not apply as a thin paint coat. Lay it on the wall and level it out. If wall becomes dry or mix starts to pull during application, dampen the wall again. Do not thin the material.

SPECIFIC APPLICATIONS
FOR ORDINARY WATER PRESSURE OR DAMPNESS IN BLOCK FOUNDATIONS: Apply two evenly distributed applications of Thoroseal Foundation Coating, each minimum 2 lbs. per sq. yd. (1 kg/m²) or a total of 4 lbs. per sq. yd. (2 kg/m²). Make sure both applications carry down to and over footer forming a 1" (2.5 cm) coat at junction of walls and footer.

FOR ORDINARY WATER PRESSURE IN CONCRETE FOUNDATIONS: Apply one coat, minimum of 2 lbs. per sq. yd. (1 kg/m²). Use Acryl 60 in the mixing water.

FOR SEVERE WATER PRESSURE: Brush on coating using 2 lbs. per sq. yd. (1 kg/m²). After 12 hrs., apply trowel coat of minimum 12 lbs. per sq. yd. (5.4 kg/m²) or sufficient material to bring surface to true and level lines. For trowel applications add 30 lbs. (13.6 kg) clean silica sand to each 50 lbs. (27.2 kg) of Thoroseal Foundation Coating. Treat footer as described previously in all applications. Use Acryl 60 in the mixing water when application is over concrete.

PARGE COAT: For masonry walls where local codes require a parge coat. Excellent mix: 30 lbs. (13.6 kg) clean silica sand to each 60 lbs. (27.2 kg) of Thoroseal Foundation Coating. Upon completion of parge coat, brush on a coating of 2 lbs. per sq. yd. (1 kg/m²).

FOR FAIRFAST BONDING QUALITIES: Add Acryl 60 to the mixing water. Proportions can vary depending on bonding requirements. Normal proportions are 1 part Acryl 60 to 3 parts clean water (approximately 2 qts. [1.6 liters] of Acryl 60 per 60 lbs. [27.2 kg]). For questionable applications, a test patch is recommended. Acryl 60 greatly improves mechanical properties and adhesion to smooth or dense concrete.
CKD RANGE OF EXPORT TANKS

(1) Manufactured of prime grade linear polyethylene, approved by the food and drug administration of the United States for food and water storage.

(2) Tapered design facilitates nesting, this feature reduces freight cost.

(3) Tanks are designed with a one piece molded 18 inch screw cover, this cover secures your water supply keeping out disease carrying insects and foreign particles.

(4) Tanks are available with a molded in water level gauge that lets you know your water level at a glance.

(5) Tanks are also available with a “cut-away” 4 inch water spouting inlet to facilitate rain water supply from the roof of your house.

(6) The top of the tank is firmly bolted to the base. This feature ensures protection from high winds and prevents insects and small animals from contaminating your water supply.

(7) All water tanks come complete with a manufacturer's guarantee against defects.

(8) Tanks are also available in selected colours, to match your home decor.

INSTALLATION PROCEDURES:
• All tanks must be installed on FULLY SUPPORTING flat base.
• If tanks are to be elevated on a stand for gravity feeding, please ensure that a properly engineered stand is used, as one (1) gallon of water weighs approximately 10 lbs. For example a 400 Gallon tank will weigh 4,000 lbs., therefore it is essential to use a properly engineered stand that is capable of holding this weight.
• We recommend that the tank is thoroughly rinsed with water before installation as there may be traces of foreign particles in your tank.
• The base for the tank should be cleared of any stones or sharp objects before placement to prevent damage to the tank.
• The cover should be kept on all times as algae tends to grow in sunlight. If your tank is equipped with a locking device, please use it to prevent tampering with your water supply.
• Tanks should be periodically cleaned as there tends to be material residue in the water supply. Over a period of time there will be a gradual build up of this material in your tank.

FOR FURTHER INFORMATION PLEASE WRITE TO OR CALL:
ROTOPLASTICS TRINIDAD LTD.,
P.O. Box 3109, St. James, Port of Spain, Trinidad, W.I.
Telephone: (809) 674-TANK (8265), 675-8156. Fax #: (809) 674-8339.

SPECIFICATIONS

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<tr>
<th>MODEL</th>
<th>CAPACITY</th>
<th>DIAMETER TOP</th>
<th>DIAMETER BASE</th>
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<td>CKD 600</td>
<td>600 GALS (2280 LITERS)</td>
<td>62 INS (157 CM)</td>
<td>48 INS (122 CM)</td>
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<td>400 GALS (1520 LITERS)</td>
<td>52 INS (132 CM)</td>
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<td>CKD 200</td>
<td>200 GALS (765 LITERS)</td>
<td>42 INS (107 CM)</td>
<td>32 INS (81 CM)</td>
<td>61 INS (155 CM)</td>
<td>40 LBS (18.1 KG)</td>
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Fig. 1 shows the use of a unique feature (see #5 above) which gives you the option of connecting the water spouting from your roof to a 4 inch drain inlet supplied only on ROTOPLASTICS Tuff Tanks.
APPENDIX C

MANUFACTURERS' ADDRESSES
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Manufacturer Address</th>
<th>Man. Number</th>
<th>Man. Fax</th>
</tr>
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<tbody>
<tr>
<td>2001 Company</td>
<td>PO Box 2557, Waterbury, CO</td>
<td>1-800-537-7683</td>
<td>203-573-0781</td>
</tr>
<tr>
<td>AKZO Coatings</td>
<td>1313 Windsor Ave., Box 147 Columbus OH, 43216-0147</td>
<td>809-775-1500</td>
<td>809-774-3170</td>
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<tr>
<td>American Saturated Felt, Inc</td>
<td>47 Maple Ave., P.O. Box 550, Thomaston, CT 06787</td>
<td>203-283-8239</td>
<td>203-283-0308</td>
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<tr>
<td>Anvil Paints/Coating</td>
<td>Largo FL, 34641</td>
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<td>Atlas Roofing Corp.</td>
<td>100 Georgia Pacific Way Hampton, GA 30228</td>
<td></td>
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<tr>
<td>B and B Manufacturing</td>
<td>PO Box 4937 St.Thomas VI 00803</td>
<td>809-372-1570</td>
<td>904-693-0994</td>
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<tr>
<td>Bansel</td>
<td>Box 21418, Charlotte NC 28224</td>
<td>502-348-9231</td>
<td>502-348-1037</td>
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<tr>
<td>Benjamin Moore Co.</td>
<td>PO Box 37979, Jacksonville FL, 32250</td>
<td>1-800-124-1500</td>
<td>502-348-1037</td>
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<tr>
<td>Bethlehem Steel</td>
<td>Bethlehem, PA 18016</td>
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<tr>
<td>Bird Vinyl Products, Inc.</td>
<td>PO Box 329 1010 Withrow Court, Bardstown, KY, 40004</td>
<td>613-667-3331</td>
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<tr>
<td>Bonsoe</td>
<td>PO Box 651488 Charlotte, NC 28265-1488</td>
<td>613-667-4461</td>
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<tr>
<td>Bruning</td>
<td>601 South Haven St. Baltimore, MD 21224</td>
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<tr>
<td>Carlisle Engineering</td>
<td>215-566-7470</td>
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<tr>
<td>Chemical Coatings</td>
<td>PO Box 277 Dayton OH, 45401-0277</td>
<td>613-667-4461</td>
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<td>DAP Inc.</td>
<td>221 Brooke St., Media PA 19063</td>
<td>613-667-3331</td>
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<td>Dow Corning</td>
<td>128 W 70th St., Chicago IL 60637</td>
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<td>Enco Manufac. Corp.</td>
<td>CDDA, PR</td>
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<td>Englert Metals</td>
<td>5102 Causeway Blvd. Tampa FL 33619</td>
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<tr>
<td>Finnaren/Haley Paint</td>
<td>901 Washington St. Connoheke PA 19042</td>
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<td>Futra Coatings</td>
<td>500 Laffey Ave. Hazelwood, MO 63042</td>
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<td>Gardener Asphalt Corp.</td>
<td>128 W 70th St., Chicago IL 60637</td>
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<td>GE Answer Center</td>
<td>901 Washington St. Connoheke PA 19042</td>
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<td>Geotoll Corp.</td>
<td>4398 Elkhart, IN 46516</td>
<td>613-667-3331</td>
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<tr>
<td>Gibson-Homans Co.</td>
<td>1786 Enterprise Parkway Twinsburg, OH 44087</td>
<td>613-667-3331</td>
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<tr>
<td>Harris Paints</td>
<td>25 C ST., Minillas, Industrial Park PR 00959</td>
<td>613-667-3331</td>
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<tr>
<td>Kool Seal</td>
<td>Twinsburg, OH 44087 Clearwater, FL 34622</td>
<td>613-667-3331</td>
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<td>Kurefas Coatings, Inc.</td>
<td>Louisville, KY 40201</td>
<td>613-667-3331</td>
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<td>Lanco</td>
<td>3851 NW 59th St. Miami, FL 33142</td>
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<tr>
<td>Mameco International, Inc.</td>
<td>4475 East 175th Street, Cleveland, Ohio 44128-3599</td>
<td>613-667-3331</td>
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<td>Manufacturing Corp.</td>
<td>San Lorenzo, PR 00954</td>
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<td>Master Choice</td>
<td>1700 Washington St. Jamestown, NY 14701</td>
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<tr>
<td>Masterchem Industries</td>
<td>PO Box 368, Barnhart, MO 63012</td>
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<td>Masters Choice</td>
<td>Jamestown NY, 14701</td>
<td>613-667-3331</td>
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<tr>
<td>Mobile Paints</td>
<td>Box 380, Ohio 00917</td>
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<tr>
<td>Nicholas Aluminum</td>
<td>1725 Rockingham Rd. Davenport IA 52802</td>
<td>613-667-3331</td>
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<td>Nordi Blummi</td>
<td>Macon, GA 31209-3676</td>
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<td>Oatey</td>
<td>Mentor, OH 44060</td>
<td>613-667-3331</td>
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<tr>
<td>Olympia International</td>
<td>600 Grant St. Pittsburgh, PA 15219</td>
<td>613-667-3331</td>
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<tr>
<td>Oregon Res. and Dev. Corp.</td>
<td>1895 16th ST. SE Salem, OR 97302-1436</td>
<td>613-667-3331</td>
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<tr>
<td>Parks Corp.</td>
<td>Sommerset, MA 02762</td>
<td>613-667-3331</td>
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<td>Pittsburgh Paints</td>
<td>Pittsburgh, PA 15272</td>
<td>613-667-3331</td>
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<tr>
<td>Plastmo Inc.</td>
<td>8246 Sandy Court Jessup, MD 20794</td>
<td>613-667-3331</td>
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<tr>
<td>Reliance Caribbean</td>
<td>RD. 28 KOMS Bayamon , PR 00957</td>
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<tr>
<td>Rooftops</td>
<td>Estate Friedenstein, St. Croix VI, 00820-4707</td>
<td>613-667-3331</td>
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<td>Rooftops/Tech. Coating</td>
<td>Estate Friedenstein, St.Croix</td>
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<td>Rust-Oleum Corp.</td>
<td>Vernon Hills, IL 60061</td>
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<tr>
<td>Scott</td>
<td>7839 Fruitville RD., Sarasota, FL 34240</td>
<td>613-371-0015</td>
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<td>Scotts Paint Corp.</td>
<td>Buitler, PA 16003</td>
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<td>Snow Roof Systems</td>
<td>11801 Industry Dr. Jacksonville FL, 32218</td>
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<tr>
<td>Southeast Metals</td>
<td>527 Main ST. Royers Ford, PA 19468</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Stan's Leap</td>
<td>Wheeling IL, 60090-6905</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Sunnyside Corp.</td>
<td>Box 7350, Christiansted, USVI 00823</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Technical Coatings</td>
<td>Industrial Park , St.Croix</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Tech. Coatings</td>
<td>St. Croix USVI 00823</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Tech. Coatings</td>
<td>St. Croix USVI 00823</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>The Major Group</td>
<td>24 Industry RD., Valpine, MA 02018-1305</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Thoro System Products Inc Prod.</td>
<td>Jacksonvile FL, 32250-8208</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Thoro System Products Inc Prod.</td>
<td>7800NW 38 ST, FL, 33166</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Trident</td>
<td>PO Box 800515 Houston TX 77208-0515</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>True Value</td>
<td>Gary IL. 60013-0061</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Tuff-Kote Co. USA</td>
<td>210 Semmary Ave. Woodstock, IL 60098</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>Varinex Caribbean</td>
<td>Orlando, FL 32808 Sunler, SC 29150</td>
<td>613-371-0015</td>
<td></td>
</tr>
<tr>
<td>W. R. Bansal Company</td>
<td>Box 241148, Charlotte NC 28224</td>
<td>613-371-0015</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

SUPPORTING DOCUMENTS
CONTENTS OF APPENDIX D

I. Roof Coatings

Clayton Labs................................................................. D- 1
Department of Health (Topcoat)........................................ D- 6
FDA Letter (Topcoat)....................................................... D- 7
Hypalon Roof Coatings..................................................... D- 8
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Topcoat.............................................................................. D-10

II. Storage Coatings

Tuff Tank........................................................................ D-11
Vandex............................................................................. D-12
SUPPORTING DOCUMENTS

1. ROOF COATINGS
Topcoat,
24 Industrial Road.
P.O. Box 231,
Walpole,
Massachusetts,
02081-1305.
UNITED STATES OF AMERICA.

For the attention of Michael D. DeSouto

Dear Sirs.

Re: Suitability of non-metallic products for use in Contact with Water Intended for Human Consumption with Regard to their Effect on the Quality of Water British Standard BS6920:1990

We have now completed tests on your sample in accordance with the above Standard.

Details of the sample material and results of the testing schedule are given below:

Trade name and reference: Topcoat W.O.B.

General composition: Water based elastomeric coating.

Manufactured by: Topcoat, a division of Major Group Incorporated. U.S.A.

Submitted by: Topcoat, U.S.A.

Organisation responsible for sample preparation: Clayton Environmental Consultants Limited.

Description of Sample: White viscous paint.

Surface area or dimensions of individual unit/item: Coated panel - 125mm x 60mm.

Number of units/items per test: Coated panel - 15,000mm².

Calibration mark of test container: litre.

Proposed use of product: Coating for roof tops and culverts, some of which may direct drinking water into holding tanks - not for holding tanks themselves.
Cold water use only.
Wet film thickness of coatings:

580 microns

Description of preparation and application of product to test panels:

The paint was mixed well and applied to sand blasted glass panels. The panels were left to cure over two days, receiving approximately 14-16 hrs of daylight, and were then cured at 60\%RH and 20\°C for 3 days. N.B. The panels were checked, before curing in the humidity cabinet, to see that the paint was tack-free.

Taste of Water (Part 2 : Section 2.2)

Extraction of the material in test water for 24 hours at 25\°C produced an extract which, after a 1:1 dilution with test water, gave a slight dry after taste.

Continuation of the extraction process for six more occasions gave a seventh extract which, after a 1:1 dilution with test water, gave no detectable taste.

Extraction of the material in chlorinated water for 24 hours at 25\°C produced an extract which, after a 1:1 dilution with test water, gave a slight dry/paint after taste.

Continuation of the extraction process for six more occasions gave a seventh extract which, after a 1:1 dilution with test water, gave no detectable taste.

These results comply with the requirements of clause 4 of Part 1 of BS6920:1990.

Appearance of Water (Part 2 : Section 2.3)

Extraction of the material in test water for 24 hours at 25\°C gave, after subtraction of the blank, the following results:

<table>
<thead>
<tr>
<th>Colour Hazen units (Pt/Co)</th>
<th>Turbidity Formazine Units (FNU)</th>
<th>Number of Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.5</td>
<td>0.2</td>
<td>1</td>
</tr>
</tbody>
</table>

1st Extract (24 hours)

These results comply with the requirements of clause 5 of Part 1 of BS6920:1990.

D-2
Growth of Aquatic Micro-organisms (Part 2: Section 2.4)

The mean dissolved oxygen differences expressed as mg/l were as follows:

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Mean Dissolved Oxygen Difference (MDOD) mg/l</th>
<th>Number of Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sample under test</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>2. Glass reference</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>3. Paraffin wax reference</td>
<td>5.3</td>
<td></td>
</tr>
</tbody>
</table>

The mean dissolved oxygen in mg/l of the negative control was 8.0.

The bacterial counts in the test containers were as follows:

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Coliform organisms/100 ml</th>
<th>Number of Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 5</td>
<td>Week 6</td>
<td>Week 7</td>
</tr>
<tr>
<td>Sample under test</td>
<td>&lt; :</td>
<td>&lt; :</td>
</tr>
<tr>
<td>Glass reference</td>
<td>&lt; :</td>
<td>&lt; :</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Pseudomonas aeruginosa/ml</th>
<th>Number of Samples Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 5</td>
<td>Week 6</td>
<td>Week 7</td>
</tr>
<tr>
<td>Sample under test</td>
<td>&lt; :</td>
<td>&lt; :</td>
</tr>
<tr>
<td>Glass reference</td>
<td>&lt; :</td>
<td>&lt; :</td>
</tr>
</tbody>
</table>

These results comply with the requirements of Clause 6 of Part 1 of BS6920:1990.
The Extraction of Substances that may be of Concern to Public Health (Part 2: Section 2.5)

Confluent growth of Monkey Kidney Cell Line ACTT No. CCL81 was not observed in the 24 hour extract, which shows a cytotoxic response.

To comply with the requirements of clause 7 of Part 1 of BS6920:1990 two further fresh samples were tested.

Confluent growth of Monkey Kidney Cell Line ACTT No. CCL81 was observed in both 24 hour extracts, which shows a non-cytotoxic response in both.

Two of the three tests gave a pass result. This constitutes an overall pass of this section.

These results comply with clause 7 of Part 1 of BS6920:1990.

Extraction of Metals from Non-Metallic Products (Part 2: Section 2.6)

<table>
<thead>
<tr>
<th>Metal</th>
<th>Method of analysis and source of method</th>
<th>Limit of detection</th>
<th>Conc. of metal in final extracts µg/l Ex.1</th>
<th>Conc. of metal in blank µg/l</th>
<th>Maximum admissible conc. in final extract µg/l</th>
<th>Number of Samples Tested</th>
<th>Number of Extracts Carried out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium</td>
<td>I.C.P.O.E.S.</td>
<td>20</td>
<td>&lt; 20</td>
<td>&lt; 20</td>
<td>200</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Antimony</td>
<td>H.G.A.A.S.</td>
<td>1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Arsenic</td>
<td>H.G.A.A.S.</td>
<td>5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Barium</td>
<td>I.C.P.O.E.S.</td>
<td>20</td>
<td>&lt; 20</td>
<td>&lt; 20</td>
<td>1000</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cadmium</td>
<td>G.F.A.A.S.</td>
<td>0.5</td>
<td>&lt; 0.5</td>
<td>&lt; 0.5</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Chromium</td>
<td>I.C.P.O.E.S.</td>
<td>5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Iron</td>
<td>I.C.P.O.E.S.</td>
<td>20</td>
<td>&lt; 20</td>
<td>&lt; 20</td>
<td>200</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lead</td>
<td>G.F.A.A.S.</td>
<td>5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Manganese</td>
<td>I.C.P.O.E.S.</td>
<td>5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mercury</td>
<td>C.V.A.A.S.</td>
<td>0.1</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nickel</td>
<td>G.F.A.A.S.</td>
<td>5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>50</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Selenium</td>
<td>H.G.A.A.S.</td>
<td>1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Silver</td>
<td>G.F.A.A.S.</td>
<td>1</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The above results show the material to conform to the requirement of clause 8 of Part 1 of BS6920:1990.

Note:
I.C.P.O.E.S. - Inductively coupled plasma optical emission spectroscopy.
G.F.A.A.S. - Graphite furnace atomic absorption spectroscopy.
C.V.A.A.S. - Cold Vapour atomic absorption spectroscopy.
Conclusion

The samples of the product referred to in this report have been tested in accordance with the methods specified in BS6920 : Part 2 : 1990 "Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water : Methods of Test".

The product has satisfied the criteria set out in BS6920 : Part 1 : 1990. "Specification".

Please note that

1. The results specified in this report relate only to the sample(s) of this product submitted for testing. Any changes in the nature or source of ingredients and the process of manufacture or application could affect the suitability of this product for use in contact with potable water.

2. We would draw to your attention that reports issued by this test laboratory do not of themselves constitute approval by the Bermudan Authorities. Only a letter from them can be regarded as indicating approval.

Yours faithfully,

R.A. Stevens.
for: CLAYTON ENVIRONMENTAL CONSULTANTS LIMITED

N.B. A copy of this report has been sent to Ms. E. Harvey, Bermuda Ministry of Health and Social Services.
This department is in receipt of the results on tests carried out by Clayton Environmental Consultants on the product Topcoat W.O.B.

We are pleased to include "Topcoat W.O.B." on the list of Approved Potable Water Catchment Coatings 1994. A retest of this product will be required by 1999.

Yours truly,

[Signature]

Estelyn Harvey
Chief Environmental Health Officer
July 16, 1992

Mr. Russell Clark
Major Group, Inc.
P.O. Box 231
Walpole, Massachusetts 02081-1205

Dear Mr. Clark:

This is in further regard to correspondence between your firm and Dr. Daniel Harrison and our telephone conversation of July 14, 1992, concerning the use of a coating for concrete culverts and rooftops that direct water into holding tanks.

We have reviewed the composition of as stated in your submission of June 9, 1992 and find that the ingredients of TOPCAT W.O.B. are in compliance with FDA regulations for use in contact with food, including water. Therefore, we find that this coating would be suitable for use as a coating for culverts and rooftops that will direct rainwater into holding tanks for residential and retail facilities. Use of the coating in food processing plants will be addressed in a separate letter.

If we can be of further assistance in this matter, please feel free to call upon us.

Sincerely yours,

[Signature]

Thomas J. Brown
Indirect Additives Branch, HFF-125
Division of Food and Color Additives
Center for Food Safety
and Applied Nutrition
April 4, 1989

Mr. Gregory Reimer
EPA
179 Altona & Weigust
St. Thomas, U.S. Virgin Islands

Dear Mr. Reimer,

To confirm our conversation today regarding our AF-103 neoprene and AF-107 Hypalon roof coatings. Neither of these products contain lead compounds. Hypalon coatings often contain lead curing agents, however our AF-107NL is especially formulated using epoxy as a replacement for lead.

When we first considered marketing our products in the Caribbean we contacted the FDA regarding standards for roof coatings that are used in areas where water is collected from the roof. We were informed that there were no standards, but it would be prudent to use raw materials that are acceptable for use in potable water applications. Our AF-107NL was formulated with this in mind.

If there are standards regarding roof coatings in the Virgin Islands I would be most interested in receiving any information pertaining to them. In the meantime I am sending under separate cover current Material Safety Data Sheets on these products. If you have any questions please feel free to call me at (215) 566-7470.

Sincerely,

Scott Bennung

cc. Craig Kirchoff - SEACHEST
DESCRIPTION: The Neoprene component of the fluid applied roofing system. The AF-103 is suitable for sloped and well drained roofs. For ponded water use AF-103.

COLORS: Black, light and dark Grey (other colors available on special order).

PHYSICAL PROPERTIES: (cured film)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile</td>
<td>1600 psi (min.)</td>
</tr>
<tr>
<td>Elongation at 75°F</td>
<td>400% (min.)</td>
</tr>
<tr>
<td>at 200°F</td>
<td>300% (min.)</td>
</tr>
<tr>
<td>at 300°F</td>
<td>150% (min.)</td>
</tr>
<tr>
<td>Permanent set at break</td>
<td>50% (Max.)</td>
</tr>
<tr>
<td>Water absorption</td>
<td>3% by wt. (Max.)</td>
</tr>
<tr>
<td>Adhesion</td>
<td>20 lbs./linear-inch (min.)</td>
</tr>
<tr>
<td>Erosion rate per year</td>
<td>0.5 mil. 45°F South, Florida 40% + or - 1% by wt. 29% by volume</td>
</tr>
<tr>
<td>Percent solids</td>
<td>400°F 185°F (250 F intermittent)</td>
</tr>
<tr>
<td>Temperature limitations</td>
<td></td>
</tr>
</tbody>
</table>

COVERAGE: 465 ft.² per gallon per mil (two coats required)

1½ gal/100 ft.²

DRYING TIME: 24 hours between coats

APPLICATION: long nap roller, brush, or spray (special techniques have been developed for spray)

MATERIAL REQUIREMENTS: The usual minimum thickness for fluid applied neoprene roofing is 15 mils of neoprene top coat with 5 mils of Hypalon. Three gallons of AF-103 applied per 100 ft² will give a 15 mil membrane. Where surface is rough or porous, additional material will be required.

PRECAUTIONS: AF-103 is a solvent system. Do not use near open flame, pilot, welding, smoking, or other sources of ignition. Flammable liquid.

STORAGE ABILITY: One year minimum

USES AND APPLICATIONS: AF-103 is a basic Neoprene formulation containing curing agents, antioxidants, and fillers. It also incorporates resin to give optimum adhesion. AF-103 is used in a variety of applications such as waterproofing, non-slip flooring, adhesives and corrosion control coatings. The cured coating is rubber-like and resists shock and vibration.

manufactured by CHEMICAL COATINGS and ENGINEERING CO., INC.
221 BROOKE STREET • MEDIA, PENNSYLVANIA 19063 • 215 566-7470

D-9
22 July 1996

Mr. Harry H. Smith, Ph. D.
University of the Virgin Islands
Water Resources Research Institute
#2 John Brewers Bay
St. Thomas, U.S. Virgin Islands  00802-9990

Dear Dr. Smith,

We would be happy to assist your group in developing regulations requirements for the use of coatings used on rainwater catchment systems. Although there is no current regulation regarding the use of these materials in the U.S. Virgin Islands, it is obvious that a need exists.

Initially, we looked to the government of Bermuda for assistance in ensuring that our product would not pose a risk to human health. Rainfall is a large source of drinking water for the Island of Bermuda, and a testing program for coatings is in place. I have enclosed a copy of a testing program that was performed by Clayton Environmental Consultants of the United Kingdom on our TOPCOAT W.O.B. This report includes a comprehensive extraction of metals, and a test for cytotoxic response in monkey kidney cells. I have also included a copy of our approval for use on water catchment surfaces by the Bermuda Board of Heath.

Although the United States Food and Drug Administration does not officially regulate the use of coatings for this purpose, we submitted our formulation for their study. The United States F.D.A. examined the individual components of our formulation and determined that all ingredients were suitable for water catchment surfaces. A letter is enclosed.

Our standard material safety data sheets will be sent with this package as you requested.

We share in your concern for the health of the people of the U.S. Virgin Islands, and will be pleased to assist you in any way possible.

Very truly yours,

Michael DeSouto
Technical Director

Enclosures

/sb

cc:  R. Clark • TOPCOAT
SUPPORTING DOCUMENTS

IL STORAGE COATINGS
Tuff Tanks

TYPE OF MATERIAL USED IN PRODUCTS.

Virgin polyethylene is used - all products. Polyethylene is lightweight, durable, food safe (F.D.A. approved), easy to clean and very resistant to almost all chemicals making it ideal for storing various foods and corrosive chemicals safely. Chemical Tanks are produced in natural (clear) colour as well as black depending on the application. It is recommended that chemical tanks be made heavier than usual tanks to ensure safety where dangerous chemicals are used.

All products can be made in Light, Medium and Heavy Duty. This means that the wall thickness can then be altered to fit the needs of the consumer. Most of the products are available in assorted colours.
NSF International (NSF)  
OFFICIAL LISTING

This is a Certification by NSF that these products conform to the requirements of NSF Standard 61 - Drinking Water System Components - Health Effects.

This is your Official Listing as we have it on record at this time.

December 5, 1992  
CC: 07 03

VANDERB INTERNATIONAL LTD.  
SCHEIDMANNSTRASSE 3  
P.O. BOX 1336  
CH-8040 ZURICH,  
SWITZERLAND

Plant As: HAMBURG, GERMANY

<table>
<thead>
<tr>
<th>JOINTING &amp; SEALING MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Designation</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Patch Repair</td>
</tr>
<tr>
<td>Vander Plug</td>
</tr>
</tbody>
</table>

* Patch size not to exceed 4% of total surface area of tanks with volume of 27,000 gal or greater.

Not To Appear In Printed Listing

C = All products with this code are covered by the annual testing of Vander Plug.

<table>
<thead>
<tr>
<th>PROTECTIVE (RANBAND) MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Designation</td>
</tr>
<tr>
<td>Potable Water Tank Coatings</td>
</tr>
<tr>
<td>Vander Quikblinder</td>
</tr>
<tr>
<td>Vander Super 27000 gal</td>
</tr>
<tr>
<td>Vander Master *</td>
</tr>
</tbody>
</table>

* Patch size not to exceed 4% of total surface area in tanks with volumes of 27,000 gal and greater.

Not To Appear In Printed Listing

A = All products with this code are covered by the annual testing of Vander Quikblinder.
B = All products with this code are covered by the annual testing of Vander Super.

Continued on page 2

Additions Cannot Be Made To
This Listing Without Prior  
Evaluation And Acceptance By NSF

48510

Page 1

December 5, 1992

VANDERB INTERNATIONAL LTD.  
Plant As: LANSDOWNE, PA

<table>
<thead>
<tr>
<th>PROTECTIVE (RANBAND) MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Designation</td>
</tr>
<tr>
<td>Potable Water Tank Coatings</td>
</tr>
<tr>
<td>Vander Super 27,000 gal</td>
</tr>
<tr>
<td>Vander Master *</td>
</tr>
</tbody>
</table>

* Patch size not to exceed 4% of total surface area in tanks with volumes of 27,000 gal. and greater.

Not To Appear In Printed Listing

A = All products with this code are covered by the annual testing of Vander Super (Frweland Plant).