I. GENERAL

1.01 SUMMARY

A. Provide labor, materials, equipment and supervision necessary to install a 2-ply polyester reinforced spray applied asphalt emulsion and elastomeric acrylic coating system as outlined in this specification to create a seamless, fully-reinforced, fully-adhered waterproof membrane over built-up or modified bitumen roofing.

B. The manufacturer’s application instructions for each product used are considered part of these specifications and should be followed at all times.

1.02 SUBMITTALS

A. Submit product data sheets and literature verifying fire ratings and other physical and performance properties of materials.

B. Submit material safety data sheets.

1.03 QUALITY ASSURANCE

A. Supplier Qualifications: The ACRYPLY® Roofing System, as supplied by National Coatings Corporation, is approved for use on the project.

B. Applicator Qualifications: The applicator shall be approved by National Coatings Corporation to apply the system. Manufacturer’s written verification of applicator approval is required.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Containers and Packaging: Deliver materials in original sealed containers, clearly marked with: manufacturer’s logo; full product name; and lot number(s).

B. Storage: Store materials between 40°F and 100°F with careful handling to prevent damage to products. If conditions exceed these ranges, special consideration in storage must be taken. Do not store at high temperatures in direct sunlight.

C. Protection: Protect all materials from freezing and other damage during transit, handling, storage, and installation.

1.05 PROJECT CONDITIONS

A. These minimum recommendations for material usage are for ideal conditions. The number of gallons per 100 square feet may need to increase due to uneven application, rough surface texture, wind conditions while spraying or other variables.

B. Wet insulation must be thoroughly evaluated and then addressed with removal or other measures. Consult a National Coatings Technical Consultant regarding the need for moisture surveys and other assessments.
C. Structural cracks should be referred to the appropriate National Coatings Technical Consultant.
D. This installation guide specification assumes that the deck, if plywood, has no dry rot, and is in sound condition, or has been repaired.

E. Do not apply materials unless surface to receive ACRYPLY roofing system is clean, dry and prepared as specified.

F. Install all material in strict accordance with all published safety, weather, or applicable regulations of the manufacturer and/or local, state, and/or federal agencies which have jurisdiction.

G. The entire system shall be fully adhered to the surface on which it is applied. Voids left under the system by creating bridges are not acceptable.

H. Do not proceed with application of coating or sealing materials when temperature is less than 50°F. No coating system shall be applied if weather will not permit it to dry prior to exposure to precipitation or freezing.

I. Heavy puddles of coating on the roof are not acceptable.

J. Instructions for use of all roofing materials and application equipment should be read and followed at all times.

K. As a general principle, to prevent the ponding of water, install additional drains or drainage systems as necessary.

1.06 DETAIL WORK

A. This specification does not extensively outline procedures for preparation and finishing of drains, vents, ducts, flashings, parapet walls, sheet metal work, etc. This work should be outlined by the contractor before work commences, and shall be performed observing good trade practices.

II. PRODUCTS

2.01 ACRYPLY ROOFING SYSTEM

A. The roofing system is a polyester-reinforced emulsion and acrylic, elastomeric, spray-applied ACRYPLY Roofing System manufactured by National Coatings Corporation.

B. The asphalt emulsion shall be LIQUISEAL™ or an equivalent that meets the following physical property requirements:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids by Volume (%)</td>
<td>45-55</td>
</tr>
<tr>
<td>Pounds per Gallon</td>
<td>8.5 lbs.</td>
</tr>
<tr>
<td>Flexibility(@32°F)</td>
<td>No Cracking</td>
</tr>
<tr>
<td>Drying Time (hrs.)</td>
<td>Normally 12 hrs.*</td>
</tr>
<tr>
<td>Meets or Exceeds</td>
<td>ASTM D1227-76 Type 1 (Modified)</td>
</tr>
<tr>
<td></td>
<td>Fed. Spec. SS-R-1781 Type 1 (Modified)</td>
</tr>
<tr>
<td></td>
<td>Mil. Spec. MIL-R-3472A</td>
</tr>
</tbody>
</table>

C. The reinforcing fabric shall be Tietex T272, T325 or T326 or an equivalent that meets the following physical property requirements:
### Physical Properties of Cured Roofing System


1. The roofing system shall have good resistance to ponding water.
2. The roofing system shall contain no plasticizers.
3. The roofing system shall contain no migrating fire retardants.
4. The roofing system shall have a Class A fire rating on a noncombustible deck when tested according to the procedures outlined in ASTM E-108.
5. The protective acrylic coating system shall meet the following physical property requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>ASTM Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength, psi (Max @ 73ºF)</td>
<td>D6083</td>
<td>Minimum 250</td>
</tr>
<tr>
<td>% Elongation @ Break (73ºF)</td>
<td>D6083</td>
<td>Minimum 250</td>
</tr>
<tr>
<td>Wet adhesion to Specified Substrate</td>
<td>D6083</td>
<td>Minimum 3.0 pli</td>
</tr>
<tr>
<td>Permeance, perms</td>
<td>D6083</td>
<td>Maximum 15</td>
</tr>
<tr>
<td>Volume Solids %</td>
<td>D6083</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>Weight Solids %</td>
<td>D6083</td>
<td>&gt; 65</td>
</tr>
</tbody>
</table>

### 2.02 RELATED MATERIALS

A. Flashing, adhesives, thinners, elastomeric caulking compounds, primers, and similar materials shall be approved by the manufacturer of the coatings. All materials used shall be applied in accordance with its manufacturer’s recommendations.

### 2.03 EQUIPMENT

A. For recommended spray equipment guidelines, please refer to National Coatings Technical Paper "TP-102 Guide for Selecting Coating Spray Equipment", or consult the spray equipment manufacturer directly.

### III. EXECUTION

#### 3.01 MANUFACTURER’S INSTRUCTIONS

A. Compliance: Comply with manufacturer’s product data, including product technical bulletins and product guide specification instructions.
3.02 EXAMINATION

A. Inspect surfaces which will receive the ACRYPLY Roofing System to make sure they are clean, smooth, sound, properly prepared, and free of moisture, dirt, debris, or other contamination.

B. Verify that all roof penetrations, mechanical equipment, cants, edge metal, and other on-roof items are in place and secure.

C. Verify that all critical areas around the immediate vicinity of the spray area are suitably protected.

D. Verify all roof drains are clean and in working order.

E. Verify that all air conditioning and air intake vents are suitably protected or closed.

3.03 PREPARATION

A. The surface must be clean, sound, dry and free of any materials that would inhibit proper adhesion of the asphalt emulsion or coating. Achievement of this condition may require the use of INDUSTRIAL CLEANER, scraping, power brooming, vacuuming or other means, and shall always be performed observing good trade practices.

B. On built-up roofs with gravel, the entire roof shall be spudded to as smooth a surface as possible. After spudding, cleaning and preparing as specified herein, apply as much LIQUISEAL asphalt emulsion as necessary for leveling of the entire surface.

C. Any wet areas must be removed. After drying, replace these areas with similar roofing materials, building it up to the height of the surrounding area. After the removed area is completely replaced, seal around the edges with ACRYFLEX®. Then all the sealed edges shall be coated with LIQUISEAL and polyester reinforcing fabric as is described in 3.03 E of these recommendations.

D. Roof membrane shall be repaired and made sound and watertight prior to application of the fluid applied reinforced roofing membrane using one or more of the following steps.

E. Repair all cracks, voids, holes or other surface imperfections in the roof field or flashing areas with ACRYFLEX as appropriate. After allowing the sealant to dry (normally at least 24 hours), these areas shall be coated with LIQUISEAL applied at the rate of at least 6 gallons per 100 square feet. Polyester reinforcing fabric shall then be embedded in the wet coat of emulsion. The polyester fabric shall extend 4 to 6 inches beyond the area in need of repair. The emulsion shall extend 2 inches beyond the edges of the polyester reinforcing fabric.

F. All blisters and ridging shall be cut, dried out, re-adhered and sealed with elastomeric mastic or ACRYFLEX provided water can evaporate away from the ACRYFLEX repair. After allowing sealant to dry, apply LIQUISEAL and polyester reinforcing fabric as described in section 3.03 E of this installation guide specification.

G. Seal all HVAC ductwork joints as needed with ACRYFLEX and reinforcing polyester fabric and/or BUTYL SEAM TAPE. Coat entire duct assembly with two 1½-gallon coats (per 100 sq. ft.) of ACRYSHIELD® A400.

H. Reseal around all mechanical equipment and roof penetrations with ACRYFLEX.

I. All loose seams of existing roof system shall be fastened down and sealed with roofing mastic. Sealant must seal fasteners as well. After allowing sealant to dry (normally at least 24 hours), apply LIQUISEAL and polyester reinforcing fabric as described in section 3.03 E of this installation guide specification.
J. In all valley areas, waterways, drain areas or other areas where potential water accumulation is a concern, apply LIQUISEAL at the rate of 5 gallons per 100 square feet, approximately 46 inches wide. Immediately embed 40-inch wide T272, T325 or T326 polyester reinforcing fabric into the wet coating. The emulsion shall extend a minimum of 2 inches beyond the edges of the polyester reinforcing fabric. In any large valley area multiple widths of fabric should be used, overlapping them a minimum of 3 inches so that the emulsion and fabric extend at least six inches up above the potential waterline.

K. Allow LIQUISEAL to dry thoroughly before proceeding to application of the remainder of the roofing system as described in section 3.04 of this installation guide specification.

3.04 APPLICATION

A. The entire roof shall receive the ACRYPLY Roofing System consisting of two plies of T272, T325 or T326 polyester reinforcing fabric and at least 10 gallons per 100 square feet of LIQUISEAL, applied evenly as described below. This will be followed by the application of 3 coats of ACRYSHIELD, applied to a total minimum thickness of 40 dry mils (approximately 5 gallons per 100 square feet). Total minimum system thickness of 130 mils including polyester fabric.

B. Plies 1 & 2 - LIQUISEAL & Polyester Reinforcing Fabric:

1. **NOTE:** Often a roll of polyester reinforcing fabric has 1 edge that is thicker than the other. When overlapping fabric, always make sure the thicker edge ends up underneath the fabric overlapping it. Do not overlap with the thicker edge on top of another fabric layer.

2. For the first ply, apply LIQUISEAL approximately 46 inches wide at the rate of at least 6 gallons per 100 square feet. Immediately embed 20 inch wide polyester reinforcing fabric into the wet emulsion. Using a roller or roofing broom, apply pressure to the surface of the fabric to ensure good saturation of the fabric by the emulsion, working out any wrinkles at the same time. Immediately apply a second coat of LIQUISEAL over the area at the rate of at least 5 gallons per 100 square feet. A second ply of 40-inch wide polyester reinforcing fabric should then be laid directly over the last LIQUISEAL application without fully embedding the fabric. This allows for mechanical and chemical adhesion between the acrylic top coating and the reinforced LIQUISEAL membrane.

3. Continue application using 40-inch wide polyester reinforcing fabric, overlapping each 40-inch strip by about 22 inches each time, until the entire deck is covered. Pay particular attention to assuring good saturation and sealing of all edges when applying the LIQUISEAL and polyester. This emulsion/polyester system shall extend up any parapet walls high enough so that the edges can be overlapped by a metal cap flashing. Allow LIQUISEAL to dry before proceeding.

4. **Note:** For roof system terminations not covered in this guide specification or detailed drawings, consult your National Coatings Technical Consultant.

5. At roof edges where there is no parapet wall, refer to a National Coatings Technical Consultants for edge termination details.

6. Extend the system to where it would be overlapped by flashing at A/C units and other detail work. System edges that are not overlapped by flashing shall be sealed with ACRYFLEX six inches above any potential waterline.

7. After allowing the LIQUISEAL to dry, lightly pressure-wash the cured LIQUISEAL surface to remove all residual surfactant materials that might migrate to the surface. Thoroughly rinse clean the low areas and drain areas. Allow the roof to dry and then promptly apply the protective acrylic coating to avoid further surfactant migration.
C. ACRYSHIELD Base & Top Coats:

1. After allowing the roof to dry, apply a base coat of ACRYSHIELD A503 over the entire system at the rate of 1 gallon per 100 square feet. Apply this base coat over all HVAC duct work and over the top of any parapet walls. Note: Backroll the coat of ACRYSHIELD A503 into all masonry, stucco and concrete walls.

2. After allowing the ACRYSHIELD A503 to dry, apply 3 passes of top coat of ACRYSHIELD 400, using a cross hatch technique, over the entire system at the rate of 1 1/3 gallons per 100 square feet per pass. Cut in the coating evenly at all edges, and apply this second top coat over all HVAC duct work and over the top of any parapet walls.

3. For special instructions in applying ACRYSHIELD over LIQUISEAL, read the attached technical bulletin (page 8).

4. These minimum recommendations for material usage are for ideal conditions. The number of gallons per 100 square feet may need to increase due to uneven application, rough surface texture, wind conditions while spraying, or other variables. Ensure a total application of a minimum 40 dry mils of acrylic coating.

5. No coating shall be applied if weather will not allow it to dry prior to exposure to precipitation, dew, or freezing temperatures.

3.05 FIELD QUALITY REQUIREMENTS

A. Manufacturer’s Field Services: Inspection by the coating manufacturer's representative shall be made to verify the proper installation of the system. Any areas that do not meet the minimum standards for application as specified herein shall be corrected at the contractor's expense. Manufacturer's inspection or verification shall not constitute acceptance of responsibility for any improper application of material.

3.06 CLEANING

A. Surfaces not intended to receive the ACRYPLY Roofing System shall be protected during the application of the system. Should this protection not be effective, or not be provided, the respective surfaces shall be restored to their proper conditions by cleaning, repairing or replacing. All debris from completion of work shall be completely removed from the project site.

IV. MATERIALS

The following materials listed in these recommendations are available from National Coatings Corporation:

1. ACRYSHIELD® A503 acrylic, high-performance, elastomeric roof base coating.
2. ACRYSHIELD® A400 acrylic, high-performance, elastomeric roof coating.
3. LIQUISEAL™ A200 non-fibered, asphaltic, bentonite clay emulsion emulsion.
4. LIQUISEAL™ A201 asphaltic, bentonite clay emulsion modified with acrylic rubber.
5. ACRYFLEX® acrylic, elastomeric architectural sealant; available as A150 trowelable grade or A151 brushable grade.
6. BUTYL SEAM TAPE polyester-reinforced waterproofing tape.
8. INDUSTRIAL CLEANER water-based, biodegradable cleaner.

The suggestions and data in this specification are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use are beyond our control. The prospective user should determine the suitability of our materials and installation recommendations before adopting them for commercial use.

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As an ENERGY STAR® Partner, we have determined that many of our products meet the ENERGY STAR guidelines for energy efficiency and help save money, while protecting the environment.
APPLICATION OF ACRYSHIELD®
OVER ASPHALT EMULSIONS

Standard clay type asphalt emulsions, including those modified with various resins, typically contain surfactants. Surfactants are surface active agents needed to properly mix particles during manufacturing and to provide stability of the product after packaging.

POST APPLICATION

After application of the asphalt emulsion, surfactants are drawn by moisture to the surface, leaving a soapy residue. After drying out, this residue will appear slick on your fingers when rewetted.

- Surfactants may be drawn out of the applied coating by heavy fog, dew or light rain. Then they are often carried by moisture to low areas on the roof.

- After drying on the surface, surfactant residues are easily removed by heavy rain or by washing the roof off with water.

Due to this inherent characteristic of asphalt emulsions, great care must be taken prior to applying ACRYSHIELD over the emulsion. Surfactants left on the surface will inhibit proper adhesion of ACRYSHIELD over asphalt emulsions.

AVAILABLE OPTIONS

Various options exist to avoid adhesion problems. They include:

1. Apply ACRYSHIELD before moisture has a chance to draw out the surfactants.

2. Apply ACRYSHIELD after heavy rains have washed the surfactants off the surface. In this case, moisten the low areas of the roof to check for any remaining soapy film.

3. If surfactant problems are suspected, wash off the roof with water, rinsing especially the low areas, prior to coating with ACRYSHIELD.

In hot, dry climates, such as in desert areas during summer, there is less chance for these types of surfactant problems to exist, even if the emulsion is left uncoated for many days. Use appropriate judgment in all cases to ensure a good system application with adhesion integrity.

For further information, please contact a National Coatings Technical Consultant.
Early in 1998, ASTM International published the D6083-97 specification titled “Standard Specification for Liquid Applied Acrylic Coating Used in Roofing.” The goal of the ASTM Committee D-08 on Roofing, Waterproofing, and Bituminous Materials, was to establish a minimum benchmark standard for 100% acrylic elastomeric latex coatings used in roofing systems. ASTM D6083 addresses two important shortcomings in the industry that greatly impacted how facilities professionals could assess whether a specific acrylic roof coating met minimum property and performance criteria:

- The absence of one unifying set of performance requirements left manufacturers presenting product data that varied in scope and emphasis.
- The frequent reference to specific test protocols that did not fully define testing conditions so that data generated under such protocols could not be directly compared.

Manufacturers routinely list Tensile Strength and Elongation values for their coating products. High performance acrylic coatings have substantial strength and flexibility—or so-called “toughness”. Prior to ASTM D6083, manufacturers frequently referenced ASTM D412 “Standard Test Methods for Rubber Properties in Tension,” but ASTM D412 unfortunately does not clearly specify key testing and equipment conditions such as the gage length and cross head speed of the Instron machine, or the exact temperature and humidity conditions for the test. Conducting the ASTM D412 tensile strength and elongation tests at different conditions can significantly affect reported results. Because of this, facilities professionals would sometimes end up comparing “apples to oranges” when trying to decide on an acrylic roof coating that best suited their needs.

ASTM D6083 clarifies test conditions, especially regarding tensile strength and elongation that comprise toughness. The sample shape is precisely defined (and different than ASTM D412), temperature and humidity are fixed, and cross head speed and gage length are standardized. This means that all test results from ASTM D6083 are directly comparable, unlike those from ASTM D412, and facilities professionals now have a means to compare “apples to apples.”

One needs to appreciate that as manufacturers convert their data sheets to ASTM D6083, the values reported for the same product will differ from previous ASTM D412 results. This is perfectly understandable given that different test conditions are employed. Most
important is to understand that different products from the same manufacturer or different products from different manufacturers can now be directly compared, provided ASTM D6083 results are used.

The informed facilities professional can also appreciate that ASTM D6083 sets a minimum standard for certain physical and performance properties. In specific applications, performance beyond these minimums is required and specific ASTM D6083 test results become an important indicator of this additional performance requirement.