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EVALUATION REPORT

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ER-4789

Reissued April 1, 1998

Filing Category: ROOF COVERING AND ROOF DECK CONSTRUCTION—Walking Decks (202)

POLYCOAT AND TUFFLEX WALKING DECK SYSTEMS

POLYCOAT PRODUCTS

14722 SPRING AVENUE

SANTA FE SPRINGS, CALIFORNIA 90670

TUFFLEX, INC.

14722 SPRING AVENUE

SANTA FE SPRINGS, CALIFORNIA 90670

1.0 SUBJECT

Polycoat and Tufflex Walking Deck Systems.

2.0 DESCRIPTION

2.1 General:

The Polycoat and Tufflex walking deck systems are Class A or Class B assemblies, in accordance with UBC Standard 15-2, when installed in accordance with this evaluation report. Walking decks are defined as areas located in or adjacent to a building and used for foot traffic. Exterior exit balconies, stairways, residential balconies and decks, pedestrian walkways, and similar locations are examples of walking decks.

2.2 Materials:

Components used to construct Polycoat and Tufflex walking deck assemblies include primers, membranes, surface-protection coatings, accelerators, tape, and surface materials.

2.2.1 Primers: PolyCoat primers and Tufflex primers are two-component primers used to prepare the substrate before the application of membrane and surface-protection coating materials. Three PolyCoat primers and two Tufflex primers, found in Sections 2.2.1.1 through 2.2.1.5, are recognized in this report.

2.2.1.1 PolyPrime 2140 Primer: The PolyPrime 2140 Primer is a two-component, liquid-applied, polyamine-epoxy resin primer for concrete, plywood, and metal surfaces. It is available in 2- and 10-gallon (7.6 and 37.8 L) kits. The A:B mixing ratio of the two components is 1:1 by volume, and each component has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.1.2 PolyPrime 21 Primer: The PolyPrime 21 Primer is a two-component, 100-percent-solids, liquid-applied, epoxy-polyamine primer for concrete, plywood, and metal surfaces. It is available in 3- and 15-gallon (11.3 and 56.8 L) kits. The A:B mixing ratio of the two components is 2:1 by volume, and each component has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.1.3 PolyPrime 230 Primer: The PolyPrime 230 Primer is a two-component, polyamide-epoxy-resin primer for concrete, plywood, and metal surfaces. It is available in 2-, 10-,

and 110-gallon (7.6, 37.8, and 416.3 L) kits. The A:B mixing ratio of the two components is 1:1 by volume, and each component has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.1.4 Tufflex Primer #1: The Tufflex Primer #1 is a two-component, 100-percent-solids, liquid-applied, polyamine-epoxy primer for concrete, plywood, and metal surfaces. The primer is applied to the substrate before the application of the membrane material. The A:B mixing ratio of the two components is 2:1 by volume. The product is available in 3- and 15-gallon (11.4 and 56.8 L) kits, and each component has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.1.5 Tufflex Primer #2: The Tufflex Primer #2 is a two-component, liquid-applied, polyamide-epoxy-resin primer for concrete, plywood, and metal surfaces. The primer is applied to the substrate before the application of the membrane material. The A:B mixing ratio of the two components is 1:1 by volume. The product is available in 2- and 10-gallon (7.6 and 37.9 L) kits, and each component has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.2 Membranes: The PolyCoat and Tufflex membranes are liquid-applied membranes and are the principal waterproofing component of the assemblies specified in Sections 2.5 and 2.6 of this report. Two Polycoat membranes and one Tufflex membrane, found in Sections 2.2.2.1 through 2.2.2.3, are recognized in this report.

2.2.2.1 PolyCoat PC-440 Membrane: The PC-440 Membrane is a single-component, liquid-applied, polyurethane-elastomeric membrane, and is used in the Polydeck 400 and 355 Decking Systems. It is available in 5-gallon (18.9 L) pails and 55-gallon (208.2 L) drums. When combined with the PC-50 Thickener/Accelerator, it may be used as a caulking paste. Each component has a shelf life of 6 months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.2.2 PolyCoat PC-440 SF Membrane: The PC-440 SF Membrane is a single-component, solvent-free, liquid-applied, urethane-polyurea-elastomeric membrane, and is used in the Polydeck 460 Decking System. It is available in 5-gallon (18.9 L) pails. When combined with the PC-50 Thickener/Accelerator, it may be used as a caulking paste. The material has a shelf life of 6 months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.2.3 Tufflex RBC Membrane: The Tufflex RBC Membrane is a single-component, liquid-applied, water-catalyzed, polyurethane elastomeric membrane. The membrane material is also used as a caulking material to fill cracks and joints

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in the substrate. The RBC Membrane material is available as a regular resin binder or solvent-free resin binder. RBC material is mixed with water at a mixing ratio of 2¹/₂ gallons (9.5 L) of RBC material to 2¹/₂ quarts (2.4 L) of water to yield a material called Base Membrane Material (BMM). The RBC product is available in 5-gallon (18.9 L) containers, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3 Surface-Protection Coatings: PolyCoat and Tufflex surface-protection coatings are placed over the membrane layer of the assemblies listed in Sections 2.5 and 2.6 of this report. Six PolyCoat and two Tufflex surface-protection coatings, found in Sections 2.2.3.1 through 2.2.3.8, are recognized in this report.

2.2.3.1 PolyGlaze 400 FR: The PolyGlaze 400 FR surface-protection coating is a two-part, liquid-applied, moisture-cured, aliphatic-polyester-polyurethane, surface-protection coating, and is used with the Polydeck 400 Decking System. It is available in 6-gallon (22.7 L) kits. The powder-to-liquid mixing ratio is 1:5 by volume. Unmixed components have a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.2 PolyGlaze 400: The PolyGlaze 400 surface-protection coating is a single-component, liquid-applied, moisture-cured, aliphatic-polyester-polyurethane, surface-protection coating, and is used in the Polydeck 355 and 400 Decking Systems. It is available in 1- and 5-gallon (3.8 and 18.9 L) pails, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.3 PolyGlaze AR-FR "SF": The PolyGlaze AR-FR "SF" surface-protection coating is a two-part, liquid-applied, moisture-cured, low odor, solvent-free, urethane-polyurea, surface-protection coating, and is used in the Polydeck 460 Decking System. The PolyGlaze AR-FR "SF" Accelerator must be added to the liquid portion of the PolyGlaze AR-FR "SF" coating system at a rate of 8 ounces (0.24 L) of accelerator to 5 gallons (18.9 L) of the liquid component of the AR-FR coating. After the liquid portion of the coating system has been mixed with the accelerator, the Part A (paste) and Part B (liquid) components of the coating system are mixed at a ratio of 1:2 by volume. It is available in 15-gallon (56.8 L) kits. Each component has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.4 PolySeal 1040: The PolySeal 1040 surface-protection coating is a two-part, liquid-applied, water-borne, aliphatic-urethane-polyurea, surface-protection coating, and is used with the Polydeck 460 Decking System. It is available in 1- and 5-gallon (3.8 and 18.9 L) kits. The A:B mixing ratio is 1:4 by volume, approximately. Components have a shelf life of four months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.5 Poly-I-Gard[®] 246: The Poly-I-Gard 246 coating is a single-component, liquid-applied, moisture-cured, urethane-polyurea basecoat and surface-protection coating, and is used in the Poly-I-Gard AutoDeck System. The Poly-I-Gard 246 Accelerator must be added at a rate of 8 ounces (0.24 L) of accelerator per 5 gallons (18.9 L) of Poly-I-Gard 246. It is available in 5-gallon (18.9 L) pails and 55-gallon (208.2 L) drums, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.6 Poly-I-Gard 246 SF: The Poly-I-Gard 246 SF coating is a single-component, liquid-applied, moisture-cured, solvent-free, urethane-polyurea basecoat and surface-protection coating, and is used in the Poly-I-Gard SF AutoDeck System. The Poly-I-Gard 246 SF Accelerator must be added at a rate of 8 ounces (0.24 L) of accelerator per 5 gal-

lons (18.9 L) of Poly-I-Gard 246 SF. It is available in 5-gallon (18.9 L) pails and 55-gallon (208.2 L) drums, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.7 Tufflex Colorcoat AL-Ester: The Tufflex Colorcoat AL-Ester surface-protection coating is a single-component, liquid-applied, moisture-cured, aliphatic-urethane-polyurea, surface-protection coating. It is available in 1- and 5-gallon (3.8 and 18.9 L) containers, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.3.8 Tufflex Colorcoat AL-Ester FR: The Tufflex Colorcoat AL-Ester FR surface-protection coating is a two-component, liquid-applied, moisture-cured, aliphatic-urethane-polyurea, surface-protection coating. The powder-to-liquid mixing ratio is 1:5 by volume. It is available in 6-gallon (22.7 L) kits, and has a shelf life of six months from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.4 Accelerators, Hardeners, and Catalysts: PolyCoat accelerators and Tufflex hardeners and catalysts are used with the elastomeric waterproofing membrane and the surface-protection coating materials. The accelerators, hardeners, and catalysts, found in Sections 2.2.4.1 through 2.2.4.4, are recognized in this report.

2.2.4.1 PolyCoat PC-50 Thickener/Accelerator: The PC-50 Thickener/Accelerator is a proprietary liquid catalyst used to accelerate and thicken the PC-440 and PC-440 SF elastomeric waterproofing membranes. It is available in 1-quart (0.95 L) and 1-gallon (3.8 L) containers, and has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.4.2 PolyCoat PolyGlaze Hardener: The PolyGlaze Hardener is a liquid accelerator used in the PolyGlaze 400 FR, PolyGlaze 400, PolyGlaze AR-FR "SF", Poly-I-Gard 246, and Poly-I-Gard 246 SF surface-protection coatings. It is available in 1-quart (0.95 L) and 1-gallon (3.6 L) containers, and has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.4.3 Tufflex ColorCoat Cure Accelerator: The Tufflex ColorCoat Cure Accelerator is a liquid accelerator used in the Tufflex ColorCoat AL-Ester and AL-Ester FR surface-protection coatings. The maximum mixing ratio is one quart (0.95 L) of the accelerator to 5 gallons (18.9 L) of surface-protection coating. It is available in 1-quart (0.95 L) and 1-gallon (3.8 L) containers and has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.4.4 Tufflex RBC Catalyst: The Tufflex RBC catalyst is a proprietary, organometallic catalyst used in the Tufflex RBC membrane material. The maximum mixing ratio is 3 vials (60 grams) of catalyst to 5 gallons (18.9 L) of RBC membrane material. It has a shelf life of one year from the date of manufacture when stored at 75°F (24°C) in factory-sealed, unopened containers.

2.2.5 StraightJacket Tape: The StraightJacket tape is 4 inches (102 mm) wide, and is reinforced with fiberglass. The tape is used at cracks and joints in the substrate. It is available in 150-foot-long (45.7 m) rolls.

2.2.6 Polyester Tape: The polyester tape is 3 inches (76 mm) wide. It is a nonwoven polyester material used at cracks and joints.

2.2.7 Surface Texture: Two types of surface texture material, described in Sections 2.2.7.1 and 2.2.7.2, are recognized for use with the assemblies described in Sections 2.5 and 2.6.

2.2.7.1 Surface Sand: The surface sand used with the PolyCoat and Tufflex assemblies is washed, dry, rounded crystal

silica sand, having a maximum 20 mesh [0.0331 inch (0.84 mm)] size.

2.2.7.2 EPDM Granules: The EPDM rubber granules used with the Tufflex assemblies are EPDM roofing material.

2.3 Preparation of Substrate:

Concrete or plywood substrates must be free of all contamination that may impair proper bonding. Substrates must be sloped a minimum of $\frac{1}{4}$ inch (6.4 mm) per foot (305 mm) for drainage, and must be primed with the applicable primer specified in Table 1 prior to application of the membrane and surface-protection materials.

The surface of concrete substrates must be clean and free of standing water. All holes, joints and cracks must be pointed flush with portland cement mortar, and all high spots cut or ground off, to provide a smooth, even surface. Before the material is applied, the substrate is swept or blown clean to remove dust or foreign material. Paint, grease and oil must be removed either by grinding or sandblasting, and new concrete surfaces must be acid-etched. Large areas to be covered should have control joints at intervals not to exceed 20 feet (6096 mm) on center. Control joints are cut in the same manner as for standard concrete construction, and are then caulked.

Plywood must be Exterior grade plywood, having either tongue-and-groove edges and ends blocked or all edges blocked, and having face grain perpendicular to supports. The plywood is either minimum $\frac{5}{8}$ inch (15.9 mm) or $\frac{3}{4}$ inch (19.1 mm) thick, depending on the PolyCoat and Tufflex materials applied to the substrate. See Table 1 for plywood thickness requirements. The plywood span and fastening to structural supports must comply with code. The plywood surface must be clean, dry and free of all foreign materials such as paint, grease, oil and dust. Cracks in the plywood, and all panel butt joints, must be sealed using a caulking compound.

2.4 Installation of Flashing:

All door thresholds, jambs, posts, walls, scuppers and fascia must have metal flashing in accordance with Section 1509 of the code.

2.5 Application of Polydeck Decking Materials:

See Table 1 for a summary of the Polycoat components for the Polydeck 400, Polydeck 355, Polydeck 460, Poly-I-Gard Autodeck, and Poly-I-Gard SF Autodeck systems.

2.5.1 Polydeck 400 System: The plywood or concrete substrate is prepared as described in Section 2.3 of this report. A paste consisting of a blend of PC-440 membrane material and PC-50 accelerator material is applied over all joints, cracks, and flashing. The 4-inch-wide StraightJacket tape is embedded with a trowel or putty knife into the paste at joints, cracks, and flashing. A uniform coat of PC-440/PC-50 paste is brushed over all taped areas. The caulking and taping should dry for 6 to 8 hours before applying the PolyCoat primer and membrane materials.

The substrate is primed by spray, brush, or roller with either Polyprime 2140, Polyprime 21, or Polyprime 230 at a rate of 1 gallon (3.8 L) per 300 square feet (27.9 m²). The two components of the primer must be mixed before being applied to the substrate.

After the Polyprime material becomes tack-free, the first coat of the Polycoat PC-440 membrane material is evenly applied at a rate of 3 gallons (11.4 L) per 100 square feet (9.3 m²), using a notched trowel, a squeegee, airless spray equipment, or a phenolic-core roller. The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. When cured, the yield is approximately 33 dry mils (0.84 mm). After the first coat has cured, a second coat of Polycoat PC-440 membrane material is applied at the rate of $1\frac{1}{2}$ gallons (5.7 L) per 100 square feet (9.3 m²). A layer of surfacing sand is applied over the wet second-membrane coating, cov-

ering it completely. After allowing the second coat to cure for a minimum of 16 hours and a maximum of 48 hours, excess sand is removed. When cured, the second membrane coating has a uniform, dry-finish thickness of approximately 16 mils (0.41 mm).

Polyglaze 400 FR surface-protection coating material is evenly applied at a rate of $1\frac{1}{4}$ gallons (4.7 L) per 100 square feet (9.3 m²), with a yield of approximately 12 dry mils (0.3 mm). After a minimum 24-hour cure time, a second coat of Polyglaze 400 surface-protection coating material is applied at a rate of $\frac{3}{4}$ gallon (2.8 L) per 100 square feet (9.3 m²), with a yield of approximately 8 dry mils (0.2 mm). A minimum cure time of 72 hours is required before permitting heavy traffic. The finished dry thickness of the system, exclusive of the sand, is 70 mils (1.78 mm).

2.5.2 Polydeck 355 System: The Polydeck 355 Decking System is applied to either plywood or concrete substrates in a manner similar to the Polydeck 400 Decking System, except the coverage rates are different. The first coat of the PC-440 membrane material is applied at a rate of 2 gallons (7.6 L) per 100 square feet (9.3 m²), with a yield of 22 dry mils (0.56 mm). The second coat of PC-440 membrane material is applied at a rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²), with a yield of 11 dry mils (0.3 mm). Both the first and second coats of Polyglaze 400 surface-protection coating material are applied at a rate of $\frac{3}{4}$ gallon (2.8 L) per 100 square feet (9.3 m²). The total surface-protection coating thickness is 17 dry mils (0.43 mm). Preparation of substrates; caulking of joints and cracks; and method of applying the primer, membrane, and surface-protection materials are the same as the Polydeck 400 Decking System. The finished dry thickness of the system, exclusive of the sand, is 55 mils (1.4 mm).

2.5.3 Polydeck 460 System: The plywood or concrete substrate is prepared as for Polydeck 400 with an application of Polyprime 21 primer material at a rate of 1 gallon (3.8 L) per 300 square feet (27.9 m²), by spray, brush, or roller. After the Polyprime material becomes tack-free, the first coat of the Polycoat PC-440 SF membrane material is evenly applied at a rate of 2 gallons (7.6 L) per 100 square feet (9.3 m²), using a notched trowel, squeegee, airless spray equipment, or phenolic-core roller. The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. When cured, the membrane coating has a uniform dry-finish thickness of approximately 28 dry mils (0.71 mm). After the first coat has cured, a second coat of Polycoat PC-440 SF membrane material is applied at the rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²). A layer of surfacing sand is applied over the wet second membrane coating, covering it completely. After allowing the second coat to cure for a minimum of 16 hours and a maximum of 48 hours, excess sand is removed. When cured, the second membrane coating has a uniform dry-finish thickness of approximately 14 dry mils (0.36 mm).

Polyglaze AR-FR "SF" surface-protection coating material is evenly applied at a rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²), with a yield of approximately 14 dry mils (0.36 mm). After a minimum 24-hour cure time, a coat of Polyseal 1040 surface-protection coating material is applied over the cured Polyglaze material at a rate of 1 gallon (3.8 L) per 200 square feet (18.6 m²), with a yield of approximately 2 dry mils (0.05 mm). After a minimum 6-hour cure time, a second coat of Polyseal 1040 surface-protection coating material is applied at a rate of 1 gallon (3.8 L) per 200 square feet (18.6 m²), with a yield of approximately 2 dry mils (0.05 mm). A minimum of 72 hours of curing is required before permitting heavy foot traffic. The finished dry thickness of the system, exclusive of the sand, is 60 mils (1.53 mm).

2.5.4 Poly-I-Gard 246 System: The plywood or concrete substrate is prepared as described in Section 2.3.1 of this report. A paste consisting of a blend of PC-440 membrane material and PC-50 accelerator material is applied over all joints, cracks, and flashing. Using a trowel or putty knife, the

StraightJacket or polyester tape is embedded into the paste at joints, cracks, and flashing. A uniform coat of PC-440/PC-50 paste is brushed over all taped areas. The caulking and taping should dry for 6 to 8 hours before applying the PolyCoat primer and membrane materials.

By spray, brush, or roller, the substrate is primed with either Polyprime 2140, Polyprime 21, or Polyprime 230 at a rate of 1 gallon (3.8 L) per 300 square feet (27.9 m²). The two primer components must be mixed before being applied to the substrate.

After the Polyprime material becomes tack-free, Poly-I-Gard 246 membrane material is evenly applied at a rate of 1¹/₄ gallons (4.7 L) per 100 square feet (9.3 m²) by using a notched trowel, squeegee, airless spray equipment, or phenolic-core roller. The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. When cured, the yield is approximately 14 dry mils (0.36 mm). At ramps, turn radii, and other areas subject to moderate to heavy foot traffic, an additional coat of Poly-I-Gard 246 is applied at a rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²). After the first coat has cured, a second coat of Poly-I-Gard 246 membrane material is applied, at the rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²). Washed, dry, rounded, crystal silica sand, 20 mesh, 6.5 mohs minimum hardness, is immediately broadcast at a rate of 10 pounds (4.5 kg) per 100 square feet (9.3 m²). The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. This coat will result in an additional 11 ± 2 dry mils over heavy traffic areas. A third coat of Poly-I-Gard 246 is applied to the entire surface at a rate of 1¹/₄ gallons (4.7 L) per 100 square feet (9.3 m²). This coat will result in an additional 11 ± 2 dry mils over heavy traffic areas. After 24 hours, light foot traffic may be permitted but 72 hours should pass before any auto traffic is allowed on the surface. The system as applied in this section will provide 40 dry mils, exclusive of aggregate (50 dry mils over ramps, turn radii, and other heavy traffic areas).

2.5.5 Poly-I-Gard 246 SF System: The concrete substrate is prepared as described in Section 2.3.1 of this report. A paste consisting of a blend of PC-440 SF membrane material and PC-50 accelerator material is applied over all joints, cracks, and flashing. Using a trowel or putty knife, the 3-inch-wide (76 mm) polyester tape is embedded into the paste at joints, cracks, and flashing. A uniform coat of PC-440 SF/PC-50 paste is brushed over all taped areas. The caulking and taping should dry for 6 to 8 hours before application of the Polycoat primer and membrane materials.

By spray, brush, or roller, the substrate is primed with Polyprime 21 at a rate of 1 gallon (3.8 L) per 300 square feet (27.9 m²). The two primer components must be mixed before being applied to the substrate.

After the Polyprime material becomes almost tack-free, Poly-I-Gard 246 SF membrane material is evenly applied at a rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²), using a notched trowel, squeegee, airless spray equipment, or phenolic-core roller. The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. When cured, the yield is approximately 14 ± 2 dry mils. Over ramps, turn radii, and other areas subject to moderate and heavy traffic, an additional coat of Poly-I-Gard 246 SF is applied at a rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²). Washed, dry, rounded, crystal silica sand, 20 mesh, 6.5 mohs minimum hardness, is immediately broadcast at a rate of 8 to 10 pounds (3.6 to 4.5 kg) per 100 square feet (9.3 m²). This coat will result in an additional 14 ± 2 dry mils over heavy traffic areas. The coating is allowed to cure for a minimum of 16 hours and a maximum of 48 hours. A second coat of Poly-I-Gard 246 SF is applied to the entire surface at a rate of ³/₄ gallon (2.8 L) per 100 square feet (9.3 m²). Washed, dry, rounded, crystal silica sand, 20 mesh, 6.5 mohs minimum hardness, is immediately broadcast at a rate of 10 pounds (4.5 kg) per 100 square feet (9.3 m²). The coating is allowed to cure for a minimum of 16

hours and a maximum of 48 hours. This coat will result in an additional 11 ± 2 dry mils over heavy traffic areas. A third coat of Poly-I-Gard 246 SF is applied to the entire surface at a rate of ³/₄ gallon (2.8 L) per 100 square feet (9.3 m²). This coat will result in an additional 11 ± 2 dry mils over heavy traffic areas. After 24 hours, light foot traffic may be permitted but 72 hours should pass before any auto traffic is allowed on the surface. The system as applied in this section will provide 40 dry mils, exclusive of aggregate (50 dry mils over ramps, turn radii, and other heavy traffic areas).

2.6 Application of Tufflex Decking Materials:

See Table 1 for a summary of the components for the Tufflex A and Tufflex B Decking Systems.

2.6.1 Tufflex A: The concrete or plywood substrate is prepared as described in Section 2.3 of this report. An even coat of Tufflex RBC base membrane mixture is applied over the joints and cracks. The StraightJacket tape is centered and embedded in the prepared joint or crack. After the tape is installed, an even coating of the RBC base membrane mixture is brushed over the tape. The caulking and tape are permitted to dry 1 to 2 hours before applying the primer material.

The substrate is primed by spray, brush, or roller with Tufflex Primer # 2 or # 1 at a rate of 1 gallon (3.8 L) per 300 square feet (27.9 m²). After the primer has cured to a nearly tacky finish, the Tufflex Base Membrane Material (BMM) is evenly applied to the entire substrate surface at a rate of 3 gallons (11.4 L) per 100 square feet (9.3 m²), using a notched trowel, a squeegee, a phenolic-core roller, or airless spray equipment. After curing for a minimum period of 4 hours or until it is able to support worker foot traffic, a second coating of Tufflex BMM membrane material is applied at the rate of 1 gallon (3.8 L) per 100 square feet (9.3 m²). While the second coat of BMM material is still wet, sand is spread, completely covering the surface. After curing, excess sand is removed.

Tufflex Colorcoat AL-Ester FR surface-protection material is evenly applied to the entire surface at a minimum rate of 1¹/₄ gallons (4.7 L) per 100 square feet (9.3 m²), yielding approximately 14 dry mils (0.36 mm). After curing for 24 hours (or 12 hours when the Tufflex Colorcoat Accelerator material is added to the surface-protection mixture), a coat of Tufflex Colorcoat AL-Ester surface-protection material is applied at a minimum rate of ³/₄ gallon (2.8 L) per 100 square feet (9.3 m²), yielding approximately 8 dry mils (0.2 mm). A minimum of 24 hours should pass before permitting light foot traffic, and a minimum of 72 hours should pass before permitting heavy traffic; if the Tufflex Colorcoat Accelerator material is added to the surface-protection mixture, the curing time required before traffic is permitted is reduced to 12 and 24 hours, respectively. The finished system thickness, exclusive of the sand, is between 70 and 80 dry mils (1.8 and 2.0 mm).

2.6.2 Tufflex B: The Tufflex B system is applied in a manner similar to that for the Tufflex A system, except that only one coat of the Tufflex BMM membrane material is applied, and its application rate is 4 gallons (15.1 L) per 100 square feet (9.3 m²). EPDM rubber granules are used as the aggregate to achieve a slip-resistant texture. The finished system thickness, exclusive of the sand, is between 70 and 80 dry mils (1.8 and 2.0 mm).

2.7 Method of Repair:

Damaged areas can be repaired by cutting out an area extending 6 inches (152 mm) beyond the damage; cleaning with a urethane-active solvent; and applying the primer, base membrane, and topcoats in the same manner as described in this report.

2.8 One-hour Fire-resistive Construction:

The Polydeck 355, Polydeck 400, Polydeck 460, Tufflex A and Tufflex B deck systems are permitted to be substituted for the double wood floor described in Table 7-C of the code when installed in accordance with this report over ³/₄-inch-thick

(19 mm) Exterior 1 plywood supported by 2-by-10 joists spaced maximum 16 inches (406 mm) on center.

2.9 Identification:

Individual containers of each component bear a label indicating the name and address of the manufacturer, the product designation, the evaluation report number (ICBO ES ER-4789), shelf life information in the form of an expiration date, and the name of the quality control agency (Ramtech Laboratories, Inc.).

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICBO ES Acceptance Criteria for Walking Decks (AC39), dated September 1991; product brochures; and a quality control manual.

4.0 FINDINGS

That the Polycoat and Tufflex systems described in this report comply with the 1997 *Uniform Building Code*™ as walking deck systems, subject to the following conditions:

4.1 The systems are installed in accordance with this report and the manufacturer's instructions by applicators approved by Polycoat Products Company or Tufflex, Inc.

4.2 The products are manufactured at Santa Fe Springs, California, under a quality control program with inspections by Ramtech Laboratories, Inc. (NER-QA293).

This report is subject to re-examination in two years.

TABLE 1—POLYDECK DECKING SYSTEMS

ITEM NO.	POLYDECK SYSTEM	POLYDECK COMPONENTS					ROOF CLASSIFICATION		
		Treatment of Joints/Cracks in Substrate	Primer	Base Membrane	Surfacing Material Washed, Dry, Rounded, Crystal Silica Sand, 20 Mesh, 6.5+ Moh	Finish Coat	Substrate	Max. Slope (inch per horizontal foot)	Classification (UBC Std. 15-2)
1	Polydeck 400	PC-440 combined with PC-50 as caulking compound, and StraightJacket tape for reinforcement	Polyprime 2140, Polyprime 21, or Polyprime 230. One gal. (mixture of Side A & Side B) per 300 sq. ft.	<u>First Coat:</u> PC-440 3 gal. per 100 sq. ft. <u>Second Coat:</u> PC-440 1 1/2 gal. per 100 sq. ft.	Sand 100 lbs. per 100 sq. ft.	<u>First Coat:</u> Polyglaze 400FR 1 1/4 gal. per 100 sq. ft. <u>Second Coat:</u> PolyGlaze 400 3/4 gal. per 100 sq. ft.	3/4-inch Plywood	1/4	A
							Concrete	1/4	A
2	Polydeck 355	Same as Item 1	Same as Item 1	<u>First Coat:</u> PC-440 2 gal. per 100 sq. ft. <u>Second Coat:</u> PC-440 1 gal. per 100 sq. ft.	Same as Item 1	<u>First Coat:</u> Polyglaze 400 3/4 gal. per 100 sq. ft. <u>Second Coat:</u> PolyGlaze 400 3/4 gal. per 100 sq. ft.	5/8-inch Plywood	1/4	B
							Concrete	1/4	A
3	Polydeck 460	PC-440 SF combined with PC-50 as caulking compound, and StraightJacket tape for reinforcement	Polyprime 21. One gal. (mixture of Side A & Side B) per 300 sq. ft.	<u>First Coat:</u> PC-440 SF 2 gal. per 100 sq. ft. <u>Second Coat:</u> PC-440 SF 1 gal. per 100 sq. ft.	Same as Item 1	<u>First Coat:</u> Polyglaze AR/FR "SF" 1 gal. per 100 sq. ft. <u>Second & Third Coats:</u> Polyseal 1040 1/2 gal. per 100 sq. ft.	3/4-inch Plywood	1/4	A
							Concrete	1/4	A
4	Poly-I-Gard 246	Same as Item 1	Same as Item 1	<u>First Coat:</u> Poly-I-Gard 246 1 1/4 gal. per 100 sq. ft. <u>Ramps, Turn Radii, and Heavy Traffic</u> Poly-I-Gard 246 1 gal. per 100 sq. ft. <u>Second Coat:</u> Poly-I-Gard 246 1 gal. per 100 sq. ft.	Sand 10 lbs. per 100 sq. ft.	<u>Final Coat:</u> Poly-I-Gard 246 1 1/4 gal. per 100 sq. ft.	Concrete	1/4	A

(Continued)

TABLE 1—POLYDECK DECKING SYSTEMS—(Continued)

ITEM NO.	POLYDECK SYSTEM	POLYDECK COMPONENTS					ROOF CLASSIFICATION		
		Treatment of Joints/Cracks in Substrate	Primer	Base Membrane	Surfacing Material Washed, Dry, Rounded, Crystal Silica Sand, 20 Mesh, 6.5+ Moh	Finish Coat	Substrate	Max. Slope (inch per horizontal foot)	Classification (UBC Std. 15-2)
5	Poly-I-Gard 246 SF	Same as Item 3	Same as Item 3	<p><u>First Coat:</u> Poly-I-Gard 246 SF 1 gal. per 100 sq. ft.</p> <p><u>Ramps, Turn Radii, and Heavy Traffic</u> Poly-I-Gard 246 SF 1 gal. per 100 sq. ft.</p> <p><u>Second Coat:</u> Poly-I-Gard 246 SF 3/4 gal. per 100 sq. ft.</p>	Sand 10 lbs. per 100 sq. ft.	<p><u>Final Coat:</u> Poly-I-Gard 246 SF 1 gal. per 100 sq. ft.</p>	Concrete	1/4	A

For SI: 1 gallon = 3.8 L, 1 sq. ft. = 0.093 m², 1 lb. = 4.45 N, 1 inch = 25.4 mm.

TABLE 2—TUFFLEX DECKING SYSTEMS

ITEM NO.	TUFFLEX SYSTEM	TUFFLEX COMPONENTS					ROOF CLASSIFICATION		
		Treatment of Joints/Cracks in Substrate	Primer	Base Membrane	Surfacing Material	Finish Coat	Substrate	Max Slope (inch per horizontal foot)	Classification (UBC Std 15-2)
1	Tufflex A	Water-catalyzed Tufflex RBC base membrane material (BMM) as a caulking compound and StraightJacket tape for reinforcement.	Tufflex Primer #1 or Primer #2. 1 gal. per 300 sq. ft.	<p><u>First Coat:</u> Tufflex BMM 3 gal. per 100 sq. ft.</p> <p><u>Second Coat:</u> Tufflex BMM 1 gal. per 100 sq. ft.</p>	Sand 100 lbs. per 100 sq. ft.	<p><u>First Coat:</u> Tufflex Colorcoat AL-Ester FR 1 1/4 gal. per 100 sq. ft.</p>	3/4-inch Plywood	1/4	A
						<p><u>Second Coat:</u> Tufflex Colorcoat AL-Ester 3/4 gal. per 100 sq. ft.</p>	Concrete	1/4	A
2	Tufflex B	Same as Item 1	Same as Item 1	Tufflex BMM 4 gal. per 100 sq. ft.	Selected EPDM granules	<p><u>First Coat:</u> Tufflex Colorcoat AL-Ester FR 1 1/4 gal. per 100 sq. ft.</p>	5/8-inch Plywood	1/4	B
						<p><u>Second Coat:</u> Tufflex Colorcoat AL-Ester 3/4 gal. per 100 sq. ft.</p>	Concrete	1/4	A

For SI: 1 gallon = 3.8 L, 1 sq. ft. = 0.093 sq. meters, 1 lb. = 4.45 N, 1 inch = 25.4 mm.

TUFFLEX[®], INC.

14722 Spring Avenue • Santa Fe Springs, CA 90670 • USA • (562) 404-0479 • FAX: (562) 404-0493 • (888) TUFFLEX 883-3539

Summary of Test Report Conducted by Ramtech Laboratories on the TUFFLEX Class A (Colorcoat AL-Ester FR in first topcoat) Decking System

1. **WEATHERING TEST:** ASTM G-23, Atlas Twin Arc Weatherometer Type DH 2000 hours (equivalent to approximately 6 years of natural weathering).

Visual Examinations: No signs of chalking, crazing, cracking, blistering, delaminating, spalling, softening or any other deleterious effects.

ASTM-D 751, Five specimens weathered and five specimens aged per AC39 Sec. IV A & B. Stretch rate 12 ± 0.5 in./min.

With Aggregate:	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (lb./in.)	16.4	7.7	53	17.2	4.6
Elongation (%)	110	61	44.5	132	16.6
Without Aggregate:	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (lb./in.)	36.7	20.8	43.3	37	0.8
Elongation (%)	145	101	30.3	143	1.4

2. **AGING TEST:** ASTM D-412, Stretch rate 20 ± 0.5 in./min. Procedure D & E. Six cycles of each procedure. Material tested without aggregate.

Visual Examination after Aging Test: No sign of chalking, crazing, cracking, blistering, delamination, or any other deleterious effects.

	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (psi), ASTM D-412	861	994	13.4	1089	21
Elongation (%), ASTM D-412	201	121	40	215	6.5

	Control	Aged	% Change	Mode of Failure
Bond Strength (psi), ASTM C-297				
PRIMER #1				
Plywood	118	106	10.1	Cohesive failure of Plywood
Metal	244	213	12.7	Cohesive failure of Tufflex
Concrete	252	279	9.6	Cohesive failure of Concrete
PRIMER #2				
Plywood	123	102	17.0	Cohesive failure of Plywood
Metal	242	198	18.2	Cohesive failure of Tufflex
Concrete	209	143	31.5	Cohesive failure of Concrete

3. **PERCOLATION TEST:** ICBO Evaluation Svc., Inc. AC 39 Sect. IV-G

Loss due to Percolation after the 1000 cycles abrasion test (% of original head, max. allowed 1%): 0%

4. **ABSORPTION TEST:** ASTM D 570, 24 hour immersion in distilled water. Weight % of water absorption (max. allowed 5%): 3.7%

5. **WATER VAPOR TRANSMISSION (WVT) TEST:** ASTM E-96 Desiccant Method: WVT: 0.000000210 grams/Pa · sec · m²

WVT: 0.368 grains/ft² · hr · in. Hg

6. **ABRASION TEST:** ASTM D-1242 Method A as modified by ICBO Evaluation Svc., Inc. AC 39 Sect. IV-F (1000 cycles, 1000 grams, No. 80 TP

Aluminum Oxide Grit). Thickness lost (max. allowed 20 mils): 0.017

7. **CONCENTRATED LOAD TEST:** AC 39, Sec. IV L. One inch diameter steel plate with rounded corners.

Load [lbs]	Deflection [inches]	Load [lbs]	Deflection [inches]	Load [lbs]	Deflection [inches]
100	0.016	200	0.027	300	0.036

8. **IMPACT RESISTANCE:** A two pound steel ball dropped eight feet onto the decking system. Test was performed three time with an average indentation of 0.035 in.

9. **CRACK RESISTANCE (CRACK BRIDGING):** Top coat showed signs of cracking while bottom coat maintained its integrity.

10. **CHEMICAL RESISTANCE TESTS:** ASTM D-2299 Determine Relative Stain Resistance of Plastics by immersing specimens in 18 reagents @ 122F (50°C) for 16 hours.

SURFACE	Non-		SURFACE	Non-		SURFACE	Non-	
	Abraded	Abraded		Abraded	Abraded		Abraded	Abraded
Reagent			Reagent			Reagent		
Heavy duty detergent sol.	1	1	Muriatic acid - 10%	1	2	Ammonia solution - 5%	1	1
Anti-Freeze	1	1	Kerosene	1	1	Salt Solution - 10%	1	1
Paint thinner - 10%	1	1	Chlorine Solution - 10%	1	1	Turpentine - 10%	1	1
Sulfuric Acid - 3%	1	1	Transformer Oil	1	1	Sulfuric Acid - conc.	3	3
Diesel fuel	1	1	Hydraulic Fluids	1	1	Gasoline	1	1
Toluene	1	1	Lubricating oil	1	1	Soap Solution - 1%	1	1

NUMBER CODE: 1. Unaffected 2. Superficially Affected 3. Considerably Affected

Note: a) Of the 18 reagents used in the chemical resistance test, only sulfuric acid concentrate caused a deterioration of the decking system.

b) Weathering surface revealed no cracking, crazing, delamination, or any other deleterious effects.

c) The test specimens which were coded "No. 3 - Considerably Affected" could not be restored to their original surface condition by normal cleaning methods.

11. **Low Temperature Flexibility:** AC 39 Sec. K. 5°F. No cracking or crazing upon visual examination under 5x magnification in the bent condition.

12. **FIRE RESISTANCE TEST SERIES CLASS "A":** AC 39 Section IV C. U.B.C. Standard 15-2, ASTM E-108, U.L.790, N.F.P.A. No. 256, on ¾" (1.6cm) plywood.

A) **Intermittent Flame Exposure Test (2 decks):** Both of the decks met the requirements for Class B Intermittent Flame Exposure Test. There was no evidence of displacement, sliding, spalling, or flames underneath these decks during or after the test.

B) Spread of Flame Test (2 decks):	Base (in.)	Length (in.)
Deck 1	21	4' 10"
Deck 2	20	5' 1"
Max. Flame Spread Allowed		

C) **Burning Brand Test (4 decks):** Both decks passed. No flaming or damage occurred underneath decks. The heat areas were confined to the immediate area of brand placement. There was no displacement of the TUFFLEX A System observed during or after the test.

TUFFLEX A Decking System will satisfactorily withstand the three methods of tests for a Class A Rating on concrete substrates and Class A rating on ¾" plywood in UBC STD #32-7, ASTM E108, UL 790 and NFPA No. 256, when constructed, installed and tested as described herein.

13. ONE-HOUR FIRE-RESISTIVE CONSTRUCTION

Based on the performance of the test assembly, TUFFLEX Class A Walking Deck System installed on ¾" thick C-D plywood as a substitute for the double wood floor described in Construction No. 13, Item 13-1.1, Table No. 7-C of the 1994 U.B.C. Standard No. 7-1. The assembly was tested with 2 X 10 floor joists spaced at 16 inches on center.

The average room temperature rise on the unexposed face was 260°F and the maximum single thermometer reading was 310°F after 65 minutes. The acceptance limit is 250°F average temperature rise with no single reading over 350°F above ambient after 60 minutes. The area under the test time v. temperature curve equals the standard time-temperature E-119 curve at 60.56 minutes.

TUFFLEX[®], INC.

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Summary of Test Report Conducted by Ramtech Laboratories on the TUFFLEX Class B (Colorcoat AL-Ester FR in first topcoat) Decking System

1. WEATHERING TEST: ASTM G-23, Atlas Twin Arc Weatherometer Type DH 2000 hours (equivalent to approximately 6 years of natural weathering). Visual Examinations: No signs of chalking, crazing, cracking, blistering, delaminating, spalling, softening or any other deleterious effects.

ASTM-D 751, Five specimens weathered and five specimens aged per AC39 Sec. IV A & B. Stretch rate 12 ± 0.5 in./min.

With Aggregate:	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (lb./in.)	16.9	10.4	38.5	18.8	10.1
Elongation (%)	89	68	23.6	104	14.4
Without Aggregate:	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (lb./in.)	43.9	24.8	43.5	52.9	17
Elongation (%)	132	76	42.4	157	15.9

2. AGING TEST: ASTM D-412, Stretch rate 20 ± 0.5 in./min. Procedure D & E. Six cycles of each procedure. Material tested without aggregate

Visual Examination after Aging Test: No sign of chalking, crazing, cracking, blistering, delamination, or any other deleterious effects.

	Control	Weathered	% Change Weathered	Aged	% Change Aged
Tensile Strength (psi), ASTM D-412	915	1024	10.6	1190	23
Elongation (%), ASTM D-412	186	126	32.2	177	4.8

Bond Strength (psi), ASTM C-297	Control	Aged	% Change	Mode of Failure
PRIMER #1				
Plywood	118	106	10.1	Cohesive failure of Plywood
Metal	244	213	12.7	Cohesive failure of Tufflex
Concrete	252	279	9.6	Cohesive failure of Concrete
PRIMER #2				
Plywood	123	102	17.0	Cohesive failure of Plywood
Metal	242	198	18.2	Cohesive failure of Tufflex
Concrete	209	143	31.5	Cohesive failure of Concrete

3. PERCOLATION TEST: ICBO Evaluation Svc., Inc. AC 39 Sect. IV-G Loss due to Percolation after the 1000 cycles abrasion test (% of original head, max. allowed 1%): 0%

4. ABSORPTION TEST: ASTM D 570, 24 hour immersion in distilled water: Weight % of water absorption (max. allowed 5%): 3.7%

5. WATER VAPOR TRANSMISSION (WVT) TEST: ASTM E-96 Desiccant Method: WVT: 0.000000210 grams/Pa · sec · m²
WVT: 0.368 grains/ft² · hr · in. Hg

6. ABRASION TEST: ASTM D-1242 Method A as modified by ICBO Evaluation Svc., Inc. AC 39 Sect. IV-F (1000 cycles, 1000 grams, No. 80 TP Aluminum Oxide Grit). Thickness lost (max. allowed 20 mils): 0.015

7. CONCENTRATED LOAD TEST: AC 39, Sec. IV L. One inch diameter steel plate with rounded corners.

Load [lbs]	Deflection [inches]	Load [lbs]	Deflection [inches]	Load [lbs]	Deflection [inches]
100	0.02	200	0.032	300	0.041

8. IMPACT RESISTANCE: A two pound steel ball dropped eight feet onto the decking system. Test was performed three time with an average indentation of 0.035 in.

9. CRACK RESISTANCE (CRACK BRIDGING): Top coat showed signs of cracking while bottom coat maintained its integrity.

10. CHEMICAL RESISTANCE TESTS: ASTM D-2299 Determine Relative Stain Resistance of Plastics by immersing specimens in 18 reagents @ 122F (50°C) for 16 hours.

SURFACE Reagent	Non-Abraded		SURFACE Reagent	Non-Abraded		SURFACE Reagent	Non-Abraded	
	Abraded	Abraded		Abraded	Abraded		Abraded	Abraded
Heavy duty detergent sol.	1	1	Muriatic acid - 10%	1	2	Ammonia solution - 5%	1	1
Anti-Freeze	1	1	Kerosene	1	1	Salt Solution - 10%	1	1
Paint thinner - 10%	1	1	Chlorine Solution - 10%	1	1	Turpentine - 10%	1	1
Sulfuric Acid - 3%	1	1	Transformer Oil	1	1	Sulfuric Acid - conc.	3	3
Diesel fuel	1	1	Hydraulic Fluids	1	1	Gasoline	1	1
Toluene	1	1	Lubricating oil	1	1	Soap Solution - 1%	1	1

NUMBER CODE: 1. Unaffected 2. Superficially Affected 3. Considerably Affected

Note: a) Of the 18 reagents used in the chemical resistance test, only sulfuric acid concentrate caused a deterioration of the decking system.

b) Wearing surface revealed no cracking, crazing, delamination, or any other deleterious effects.

c) The test specimens which were coded "No. 3 - Considerably Affected" could not be restored to their original surface condition by normal cleaning methods.

11. Low Temperature Flexibility: AC 39 Sec. K. 5°F. No cracking or crazing upon visual examination under 5x magnification in the bent condition.

12. FIRE RESISTANCE TEST SERIES CLASS "B": AC 39 Section IV C. U.B.C. Standard 15-2, ASTM E-108, U.L. 790, N.F.P.A. No. 256, on ¾" (1.6cm) plywood.

A) Intermittent Flame Exposure Test (2 decks): Both of the decks met the requirements for Class B Intermittent Flame Exposure Test. There was no evidence of displacement, sliding, spalling, or flames underneath these decks during or after the test.

B) Spread of Flame Test (2 decks):	Base (in.)	Length (in.)
Deck 1	18.5	22
Deck 2	16.5	22

Max. Flame Spread Allowed

C) Burning Brand Test (4 decks): Both decks passed. No flaming or damage occurred underneath decks. The heat areas were confined to the immediate area of brand placement. There was no displacement of the Tufflex B System observed during or after the test.

Tufflex B Decking System will satisfactorily withstand the three methods of tests for a Class A Rating on concrete substrates and Class B rating on ¾" plywood in UBC STD #32-7, ASTM E108, UL 790 and NFPA No. 256, when constructed, installed and tested as described herein.

13. ONE-HOUR FIRE-RESISTIVE CONSTRUCTION

Based on the performance of the test assembly, TUFFLEX Class B Walking Deck System installed on ¾" thick C-D plywood as a substitute for the double wood floor described in Construction No. 13, Item 13-1.1, Table No. 7-C of the 1994 U.B.C. Standard No. 7-1. The assembly was tested with 2 X 10 floor joists spaced at 16 inches on center.

The average room temperature rise on the unexposed face was 260°F and the maximum single thermometer reading was 310°F after 65 minutes. The acceptance limit is 250°F average temperature rise with no single reading over 350°F above ambient after 60 minutes. The area under the test time v. temperature curve equals the standard time-temperature E-119 curve at 60.56 minutes.

International Association of Amusement Parks & Attractions (IAAPA) • Aquarium & Zoo Maintenance Association (AZMA)

Apartment Owners Association (AQA) • Building Owners & Managers Association (BOMA) • International Concrete Repair Institute (ICRI)

National Ski Areas Association (NSAA) • Construction Specification Institute (CSI) • ICBO Evaluation No. 4789 • CABO Evaluated • Los Angeles City RR No. 25171

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CALIFORNIA



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Polycoat Products
14722 Spring Avenue
Santa Fe, Springs, CA 90670

Tufflex, Inc.
3900 Pheasant Drive
Carson City, NV 89701

Attn: Laxmi C. Gupta
(310) 802-8834

RESEARCH REPORT: RR 25171

BASED UPON ICBOES EVALUATION
REPORT NO. 4789

REEVALUATION DUE DATE:
January 1, 1997

GENERAL APPROVAL - Revaluation - Polycoat and Tufflex walking deck and roof surfacing systems.

DETAILS

The above assemblies and/or products are approved when in compliance with the description, use, identification and findings of Report No. 4789, dated November, 1992, of the I.C.B.O. Evaluation Service, Incorporated. The report, in its entirety, is attached and made part of this general approval.

The parts of Report No. 4789 which are excluded on the attached copy have been removed by the Los Angeles Building Department as not being included in this approval.

DISCUSSION

The approval is based on tests in accordance with UBC Standard 32-7 and the ICBOES Acceptance Criteria for Walking Decks.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

RR 25171

Page 1 of 2



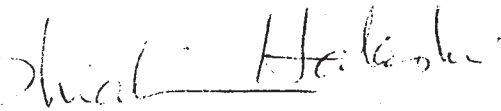
Polycoat Products

RE: Polycoat and Tufflex walking deck
and roof surfacing systems

This general approval will remain effective provided the Evaluation Report is maintained valid and unrevised with the issuing organization. Any revisions to the report must be submitted to this Department, with appropriate fee, for review in order to continue the approval of the revised report.

The status of the referenced Evaluation Report No. 4789 dated November, 1992, which is currently beyond its reexamination date is still valid. The validity of the evaluation report was verified with ICBO.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.



IBRAHIM HABASHI, Chief
Research and Development Division

JTC:sar
RR25171/D9
R11.16.94
4C/3204

Attachment: ICBOES Evaluation Report No. 4789 (5 Pages).

January 3, 1996

Tufflex Inc.
107 - 15282 19th Avenue,
White Rock, B.C.
V4A 1X6

ATTENTION: MR. W.R. SEEBER

Re: Results of Air Sample Analysis for Organic Vapors and Diisocyanates

Dear Sir;

We have completed the air sampling required for compliance with WCB Inspection Report #950750188, and report as follows:

Introduction

At the request of Tufflex Inc., Pacific Environmental conducted air monitoring for the presence of organic vapours (mainly toluene) and toluene diisocyanate (TDI), during a recent deck coating application on the B.C. Ferry, Queen of Prince Rupert.

Materials and Methods

Occupational air samples were collected from workers while they were applying the deck coating, according to the following protocol:

Three samples (1055-OV1, 1055-OV2 and 1055-OV3) were collected during the application of the primer coat, membrane coat and color coat, respectively, to the decking. An additional five samples (1055-TD1 to 1055-TD5) were collected during the same periods, to test for the presence of TDI. All sampling was conducted on December 14, 1995, using low-flow occupational sampling pumps set for 0.2 liters per minute (L/min).

Organic vapor samples were submitted to CanTest laboratories and analyzed according to WCB methods 2901 and 3301, using gas chromatography with flame ionization detection. TDI samples were analyzed, according to WCB method 3760, using high performance liquid chromatography.

Results

The following tables show the results of the air sample analysis and compare them to the regulatory requirements of the WCB.

Table 1: Organic Vapor Analysis Results

Compound	1055-OV1 (ppm)	1055-OV2 (ppm)	1055-OV3 (ppm)	WCB 8 hour PEL (ppm)
Toluene	8	0.1	0.3	100
Ethylbenzene	0.01	0.06	0.2	100
Xylene	0.4	0.5	2.2	100
Turpentine	9.3	6.3	25	100

Table 2: Toluene Diisocyanate (TDI) Analysis Results

Sample Number	TDI (ppm)	WCB 8 hour PEL (ppm)
1055-TD1	< 0.003	0.02
1055-TD2	< 0.003	0.02
1055-TD3	< 0.003	0.02
1055-TD4	< 0.003	0.02
1055-TD5	< 0.003	0.02
Clark County Airport No. 1 (supplied by Tufflex)	< 0.0024	0.02
Clark County Airport No. 2	< 0.0034	0.02

"<" = less than the limit of detection for the analytical method used

Conclusions

The results from Tables 1 and 2 indicate that the concentrations of organic vapors and diisocyanates, generated during the application of deck coatings, are far below the WCB 8 hour permissible exposure levels (PEL) for those compounds. In fact, most of the values were less than one-tenth of the PEL, for organic vapors, and below the method's limit of detection for TDI. The results of this study are also similar to those obtained during the application of the same products at the Clark County Airport in the U.S. (Table 2).

In our opinion, the half-face respirators with organic vapor cartridges (currently used by the workers) should provide more than adequate protection during the application of the deck coatings.

If further clarification of these results is required please contact me. Thank-you for having Pacific Environmental Consulting & Occupational Hygiene Services (Vancouver) perform this service for you.

Sincerely,



Geoffrey A. Clark, M. Sc., Principal
for Pacific Environmental

1055-R1



Department of Aviation

ROBERT N. BROADBENT
DIRECTOR

McCARRAN INTERNATIONAL AIRPORT
P. O. BOX 11005
LAS VEGAS, NEVADA 89111
(702) 739-6211
FAX: (702) 798-6591
or (702) 597-9553

July 8, 1992

Vern Phillips
Construction Sealant Supply
5054 Bond Street
Las Vegas, Nevada 89118

Subject: Tufflex

A test was conducted on May 20, 1992 at McCarran International Airport on Level 6 of the parking garage near door number CT/6101A, which is the north entrance to the lobby for elevator 11 and 12, to determine the PPM of Toluene Diisocyanate (T.D.I.) present during mixing and application of Tufflex.

The following conditions existed at the time of the test:

- Temperature - 85°
- Wind - calm
- Humidity - 20%
- Start of test - 0900
- End of test - 1250
- One monitor was attached to the lapel of the person who mixed and applied the Tufflex.
- One monitor was held in close proximity to the surface of the product while it was being mixed and after it was applied to the deck.

The OSHA PEL for T.D.I. is .005 PPM. The three samples, the two described above and one control was analyzed by NATLSCO (copy attached).

It appears that Tufflex, when used under the conditions described above, emits less than .005 PPM of T.D.I. and can be used by anyone who is not sensitive to T.D.I. fumes.

A handwritten signature in black ink, reading 'James R. Hettinger'.

James R. Hettinger,
MAINTENANCE MANAGEMENT PROGRAM SUPERINTENDENT

JRH/md

C:\WP51\DATA\MMMP\PHILLIPS.LTR

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Jay Bingham, Chairman • Karen Hayes, Vice-Chairman
Paul J. Christensen, Thalia M. Dondero, William U. Pearson, Don Schlesinger, Bruce L. Woodbury
Donald L. "Pat" Shelmy, County Manager



NATLSCO

LABORATORY ANALYSIS REPORT

National Loss Control Service Corporation
 Long Grove, Illinois 60049-0075
 (708) 540-2488 • Fax (708) 540-4331

ENVIRONMENTAL SCIENCES LABORATORY, K-2

REPORT DATE MAY. 29, 1992

SAMPLES REC'D MAY. 27, 1992

REQUEST NUMBER 176276

PAGE NUMBER **1** OF REQUEST.

TO: JAMES R. HETTINGER
 MCCARRAN INT'L AIRPORT
 P.O. BOX 11005
 LAS VEGAS NV 89111-1005

SAMPLE NUMBER	ANALYSIS REQUESTED	RESULTS
BLANK <i>CONTROL</i>	BLANK... TDI (HPLC)	NONE DETECTED
#001 ON <i>PERSON</i>	TDI (HPLC)	Micrograms PPM <1.0 <0.0024
#002 <i>MIX + APPLICATION AREA</i>	TDI (HPLC)	<1.0 <0.0034

COMMENTS:
 P.O. #CSS-1877
 < MEANS LESS THAN

Respectfully submitted,

Joan A Wronski /CBP

Joan A. Wronski, CIH, Manager
 Environmental Sciences Laboratory

ACCREDITED BY THE AMERICAN INDUSTRIAL HYGIENE ASSOCIATION

CLASSIFIED OR RECOGNIZED DRINKING WATER SYSTEM COMPONENTS, COMPONENT MATERIALS AND TREATMENT ADDITIVES

This Directory contains all Classifications and Recognitions in effect as of July 31, 1997 for product categories covered.

OFFICES AND TESTING FACILITIES IN THE UNITED STATES

Corporate Headquarters
333 Pfingsten Road
Northbrook, IL 60062-2096
(847) 272-8800
Fax: (847) 272-2020 or
(847) 272-8129

1655 Scott Blvd.
Santa Clara,
California 95050-4169
(408) 985-2400
Fax: (408) 296-3256

12 Laboratory Drive
P.O. Box 13965
Research Triangle Park,
North Carolina 27709-3995
(919) 547-1400
Fax: (919) 547-6000

1285 Walt Whitman Road
Melville, L.I.,
New York 11747-3081
(516) 271-6200
Fax: (516) 271-8259

2600 N.W. Lake Road
Camas, WA 98607-9526
(360) 817-5500
Fax: (360) 817-6000

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DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS
ANSI/NSF STANDARD 61

Barrier Materials

Tuffex, Inc.
14722 Spring Avenue
Santa Fe Springs, California 90670

MH25068

Plant Location:
Santa Fe Springs, California

<u>Trade Designation</u>	Water Contact <u>Temperature</u>	Water Contact <u>Material</u>
TUFFLEX Solvent-Free "TUFF"	Cold	Polyurethane

Finished product material to be used in contact with cold water. Maximum surface area to volume ratio is 10 sq cm/liter. Manufacturer's instruction for application must be followed.

RAMTECH LABORATORIES, INC.

14104 ORANGE AVENUE, PARAMOUNT, CALIFORNIA 90723-2019 • TELEPHONE (562) 633-4824 • FAX (562) 633-4128

Mr. Bob Hoffman
TUFFLEX, INC.
14722 Springs Avenue
Santa Fe Springs, CA 90670

January 13, 1998

Laboratory No. 10924-97

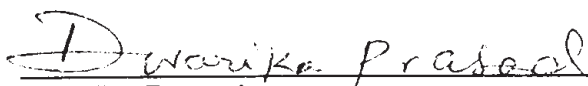
Dear Mr. Hoffman:

In compliance with your request a series of Dielectric Breakdown Voltage and Dielectric Strength tests have been conducted on your submitted sample. The tests were conducted in accordance with the procedure specified in the ASTM D 149.

The test results are detailed on the following page.

Report Prepared By:

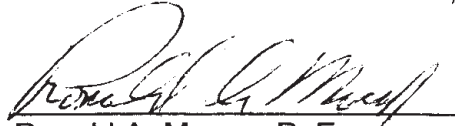
RAMTECH LABORATORIES, INC.



Dwarika Prasad
Senior Staff Engineer
RAM/DP/meza.

Report Approved By:

RAMTECH LABORATORIES, INC.



Ronald A. Macey, P. E.
Laboratory Director

Page 1 of 2

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Mr. Bob Hoffman
 TUFFLEX, INC.
 Laboratory No. 10924-97
 Page 2 of 2

January 13, 1998

TEST RESULTS:

**DIELECTRIC STRENGTH (VOLTAGE TEST)
 AND BREAKDOWN VOLTAGE TESTS**

Table No. 1

Number	Sample (s)	Results	
		Electric Field Withstand Time in Seconds at 15 kV Applied Voltage	Breakdown Voltage Volt/mil
1.	Tufflex 20/30 Texture Med. Gray, Sample 1 (Average from Nine tests)	7.1	366
2.	Tufflex 20/30 Texture Med. Gray, Sample 2 (Average from Nine tests)	7.0	365

COMMENTS:

- The test per ASTM D 149.
 Test Conditions: T = 22 °C,
 RH = 31%,
 P = 0.1013 Mpa.
- Each magnitude in the Table above is an average from nine (9) runs of the test at equidistant points of the sample surface.

LABORATORY NUMBER: 10727-96/1453

EVALUATION OF THE POLYCOAT-TUFFLEX ACCORDING TO
ANSI A118.10-1993, AMERICAN NATIONAL STANDARD FOR LOAD
BEARING, BONDED, WATERPROOF MEMBRANES FOR THIN SET CERAMIC
TILE AND DIMENSION STONE INSTALLATIONS.

PREPARED
FOR:

POLYCOAT PRODUCTS
14722 SPRING AVENUE
SANTA FE SPRINGS, CA 90670

TESTED BY

RAMTECH LABORATORIES, INC.
14104 ORANGE AVENUE
PARAMOUNT, CA 90723
(562)-633-4824

ISSUED: FEBRUARY 4, 1997

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V. SUMMARY

The Polycoat-Tufflex products when tested according to ANSI A118.10 (1989) have the following results.

Test	Result	Requirement	Remarks
Fungus	no mold growth	No mold growth	Pass
Seam Strength	39.6 pli	8 pli (16 lb./2in)	Pass
Breaking Strength	1240 psi	170 psi	Pass
Dimensional Stability ±158°F. -15°F.	Long. = 0.21% Transv. = 0.142% Long. = 0.116% Transv. = 0.094%	0.7% max.	Pass
Waterproofness (24 inch water head)	No water penetration	No water penetration	Pass
Shear Strength			
7-day -----	80 psi	50 psi	Pass
7-day Water Immersion -	62 psi	50 psi	Pass
4-week -----	74 psi	50 psi	Pass
12-week -----	70 psi	50 psi	Pass
100 day water Immersion	57 psi	50 psi	Pass

UNITED STATES DEPARTMENT OF AGRICULTURE
FOOD SAFETY AND INSPECTION SERVICE
WASHINGTON, DC

FSIS DIRECTIVE

11,000.4

8-12-94

APPROVAL OF PAINTS AND COATINGS USED IN OFFICIAL ESTABLISHMENTS

I. PURPOSE

This directive provides the revised procedures for obtaining approval of paints and coatings for walls, ceilings and floors intended for use in official establishments, effective as of the date of this publication.

II. [RESERVED]

III. [RESERVED]

IV. REFERENCES

MPI Regulations, Sections 308.3 and 381.48(a)
MPI Manual, Part 18.74(a)

V. BACKGROUND/POLICY

A. In the past, manufacturers were required to seek prior approval for paints or coatings and receive a letter of acceptance from FSIS before those items could be used in official establishments. This acceptance letter provided FSIS inspectors the information needed to determine if the product or material complied with FSIS requirements before it was used in the establishment.

B. With the revised procedures as discussed in Paragraph VI. below, paints and coatings will be acceptable to FSIS if (1) supported by the manufacturer's or supplier's written certification that the materials comply with certain agency requirements and this certification is submitted with the establishment blueprints to the Facilities, Equipment and Sanitation Division (FESD) at the time of review (see Section II

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Inspectors, Plant Mgt., T/A Plant Mgt., TRA
ABB, PRD, Import Offices

OPI: S&T/FESD

of the attachment to FSIS Directive 11,150.1, dated 10/22/92), or (2) a complete and detailed listing of the chemical composition of all components of the paints and coatings, with a performance statement. This listing must be included in the room finish schedule and must accompany the establishment blueprints submitted to FESD at the time for review. It is the responsibility of the establishment to use paints and coatings acceptable to FSIS. Paints and coatings that cannot be fully identified and their safety verified by FSIS will be removed from official establishments.

VI. CHANGE IN PROCEDURE

The FESD will accept either (1) a letter of certification from the supplier or manufacturer, or (2) a complete listing of the chemical composition of each component of the paint or coating with a performance statement noting that the product will perform well under a daily regimen of thorough cleaning, cyclical temperature change, and wet conditions. This information should be included in or be an addendum to the room finish schedule that is required to accompany the establishment blueprints submitted to FESD at the time for review.

A. **Letter of Certification.** A letter of certification that is acceptable to FSIS is a signed statement from the supplier of the paint or coating which includes the following information:

1. Product identification, brand name or "code" designation used to identify the product, and color,

2. Supplier's name and address (**NOTE:** The supplier may be any one of a number of firms; for example, the manufacturer, supplier, distributor or even the installer. The supplier is generally the firm whose name appears on the product's shipping container or other documentation accompanying the product),

3. A statement that the finished product meets the following requirements:

a. is suitable for the intended purpose and will not result in adulteration of food products if used and applied as intended or indicated on the label directions,

b. will perform well under a daily regimen of rigorous cleaning, cyclical temperature change, and wet conditions,

c. is impervious to moisture,

d. is a light solid color (excluding flooring materials) that will not obscure detection of debris or unsanitary conditions,

e. contains no known carcinogens, mutagens and teratogens classified as hazardous substances, heavy metals or other toxic substances, and

f. is not considered a pesticide and does not have pesticidal characteristics.

4. A statement noting the supplier will provide to FSIS, upon request, and in a timely fashion, the complete chemical composition of the materials used to manufacture the product.

5. The signature of the official representative of the supplier.

B. Listing of Chemical Compounds. This is a listing of chemical composition of each component in the paints or coatings intended for use in official establishments that is acceptable to FSIS. This list must also include a complete list of products and product identification, manufacturers or suppliers, colors once applied, coating components, formulations, and a statement that the product or materials will perform well under a daily regimen of thorough cleaning, cyclical temperature change, and wet conditions. This listing is provided by the supplier to the establishment inspector and should accompany the establishment blueprints submitted to FESD at the time for review.

VII. Prior Acceptance or Authorization Letters

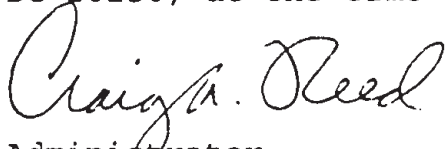
For 1 year from the date of this directive, FESD will accept prior acceptance or authorization letters that were previously issued in lieu of the letter(s) of certification or detailed listing of chemical composition in the room finish schedules. However, those prior acceptance or authorization letters must be attached to the blueprint submission, and the room finish schedule must state where the coating has been applied.

VIII. Instruction for the Inspector In Charge

A. When an establishment has previously provided documentation to the IIC that certified the paint or coating used in the establishment and later requests to use the same material, a letter from the manufacturer or supplier certifying that the material is in fact the same (with no change in name, components or formulation) must be submitted to the IIC. This information

will be included in the government file and submitted with the blueprints to FESD, Facilities Standards and Review Branch, at the time for review of the blueprints.

B. The IIC will attach the letter of certification or the listing of chemical components to the room finish schedule and specifications that accompany the establishment blueprints and send it to the FESD, Facilities Standards and Review Branch, Cotton Annex Building, Room 102, 300 12th Street S.W., Washington DC 20250, at the time for review of the blueprints.

 (Acting)
Administrator



To: All Manufacturers of Construction Materials

From: Karen M. Wesson, DVM *Karen M. Wesson*
Director
Facilities, Equipment and Sanitation Division

Subject: Approval of Paints And Coatings Used In Official
Establishments

A new directive, FSIS Directive 11,000.4 "Approval Of Paints and Coatings Used In Official Establishments" dated 8/12/94, has been issued detailing the revised procedures for obtaining approval of paints and coatings for walls, ceilings and floors intended for use in official establishments. A copy of a backgrounder on this directive is enclosed.

For 1 year from the date of this directive (8/12/94), Facilities, Equipment and Sanitation Division (FESD) will accept prior acceptance or authorization letters that were previously issued in lieu of the letter(s) of certification or detailed listing of the chemical composition in the room finish schedules. However, copies of those prior acceptance or authorization letters must be attached to the blueprint submission and the room finish schedule must state where the coating has been applied.

Any request for authorization for paints or coatings that have been received by the Product Assessment Division (PAD) after August 12, 1994 for which we have not begun the evaluation will be returned to the applicant. However, any request for authorization for paints or coatings that are currently being evaluated will be completed. Any paint or coating that was rejected during its review by FESD cannot be used and cannot be certified under the revised procedures.

If you have any further questions or inquiries, please feel free to contact Dr. David Zeitz at (202) 720-5628.



BACKGROUND

Approval of Paints and Coatings for Use in Federally Inspected Meat and Poultry Plants

The Food Safety and Inspection Service (FSIS) has established an audit program to ensure that the components of paints and coatings used in meat and poultry plants are in compliance with current regulations.

FSIS is responsible for ensuring that federally inspected meat and poultry facilities are sanitary and constructed of materials that will not result in adulterated product. The Agency's Facilities, Equipment and Sanitation Division (FESD) has revised the blueprint approval process to incorporate paints and coatings into an ongoing audit system to better assure the review of all plant construction materials. The Products Assessment Division (PAD) will assist FESD in the verification of audited products for Agency compliance standards. Uniform auditing of paints and coatings assures continuing industry compliance with the Agency's safety and sanitary requirements.

In the past, manufacturers were required to seek prior acceptance for paints or coatings and receive a letter from FSIS before use of the paint or coating in a Federally inspected plant. This letter provided Agency inspectors with a means of determining that the product or material complied with Agency requirements prior to its installation into the plant. Under the revised process, paints and coatings will be acceptable to the Agency if supported by the manufacturer or supplier's written certification that the materials comply with appropriate Agency requirements. Materials that cannot be fully identified and verified for safety will require removal from Federally inspected plants.

Audit System

The audit program for paints and coatings will help avoid delays in industry building approvals and ensure that FESD receives a completed room finish schedule with blueprint submissions. If the room finish schedule does not have sufficient information the staff reviewer cannot make a decision on the suitability or chemical acceptability of the paint or coating. The Agency has always required that the room finish schedule that accompanies the blueprints or drawings be submitted for approval. The audit procedure will aid in the enforcement of this requirement.

Change in Procedures

In the past, paints and coatings were pre-approved by the Agency and letters of acceptance were issued to the manufacturer or supplier of the product. These letters were presented to the inspector prior to the usage of the material or product in the plant. Rather than approving the materials on a case-by-case basis, the Division is inaugurating a risk based audit system for paints and coatings. This process will be accomplished through review of the room finish schedule of the blueprints submitted to FESD. In order to audit paints and coatings, all the information concerning the room finish must be included in the blueprint submittal.

With the new audit procedure, a *letter(s) of certification* must be furnished by the supplier certifying that the materials used in construction are safe for the intended application and comply with Agency requirements. Or in lieu of a letter(s) of certification, a *complete and detailed listing of the chemical composition of all components* of the paints and coatings with a statement that the product will perform well under a daily regimen of thorough cleaning, cyclical temperature change, and wet conditions must be included in the room finish schedule. PAD will work with FESD to ensure that room finish schedules or letter(s) of certification are complete and can be substantiated.

New Audit Procedures

When FESD receives the blueprints and room finish schedule(s), a reviewer will evaluate the room finish schedule to ensure that the *letter(s) of certification or a detailed listing of chemical composition of all components* with a performance statement are included. After the review of the drawings is completed, a random selection of letters of certification or detailed listings of chemical composition with a performance statement from the room finish schedule will be selected to audit. These samples selected by FESD will be referred to PAD for chemical review. This review will be based the letter(s) of certification from the supplier *or* the detailed listings of chemical composition with a performance statements in the room finish schedule. If PAD does not have the complete chemical composition of the material, the supplier will be requested to provide that information directly to the Compounds and Packaging Branch (CPB) within a specified time frame.

The new procedure does not require any extra information that has not been required by FSIS in the past. It gives the supplier a choice to furnish this information to the Agency through either a letter(s) of certification *or* a detailed listing of chemical composition of all components with a performance statement in the room finish schedule.

Letter(s) of Certification

A letter of certification acceptable to FSIS for a paint or coating is a signed statement from the supplier of the product which must include the following:

- Product identification, brand name or “code” designation used to identify the product, and color,
- Supplier’s name and address and,
- A statement that the finished product:
 - 1) is suitable for the intended purpose and will not result in adulteration of food products if used and applied as intended or indicated on the label directions,
 - 2) will perform well under a daily regimen of rigorous cleaning, cyclical temperature change, and wet conditions,
 - 3) is impervious to moisture,
 - 4) is a light solid color (excluding flooring materials) that will not obscure detection of debris or unsanitary conditions,

- 5) contains no known carcinogens, mutagens and teratogens classified as hazardous substances, heavy metals or other toxic substances,
- 6) is not considered a pesticide and does not have pesticidal characteristics,
- A statement that the supplier will provide to FSIS in a timely fashion the complete chemical composition of the materials used to manufacture the product upon request, and
- the signature of the official representative of the supplier (The supplier may be any one of a number of firms; for example, the manufacturer, supplier, distributor or even the installer. The supplier will generally be the firm whose name appears on the product's shipping container or other documentation accompanying the product).

Listing of Chemical Composition

The letter(s) of certification is expected to be less burdensome to the industry than a detailed listing of chemical composition of all components in the room finish schedule. This process will decrease the paperwork involved because the product(s) or materials will be certified by the supplier or manufacturer.

The listing of chemical composition of all components in the room finish schedule must provide the *complete* chemical composition and sufficient information to ensure trace back of each product. This is the same information that was supplied in the past to PAD for prior acceptance by FSIS. The information must include, but is not limited to, a complete list of products and product identification, manufacturers or suppliers, colors once applied, coating components, formulations, a statement of performance of the product or materials and complete chemical composition. This information must be included in the room finish schedule accompanying the blueprints submitted for approval to FESD if a letter(s) of certification is not provided.

Prior Approval Letters

For one year from the date of FSIS Directive 11,000.4 (Approval of Paints and Coatings Used in Official Establishments) FESD will accept prior acceptance or authorization letters that were previously issued in lieu of the new requirement for letter(s) of certification or detailed listing of chemical composition in the room finish schedules. However, they must be attached to the blueprint submission and the room finish schedule must state where the coating has been applied.

The Inspector-in-Charge will attach the supporting documentation to the blueprints with the room finish schedule and specifications and send it to the Facilities, Equipment and Sanitation Division, Facilities Standards and Review Branch, Cotton Annex Building Room 102, 300 12th Street S.W., Washington D.C. 20250 at the scheduled time for review of the blueprints.

TUFFLEX[®], INC.

14722 Spring Avenue • Santa Fe Springs, CA 90670 • USA • (562) 404-0479 • FAX: (562) 404-0493 • (888) TUFFLEX
883-3539

April 2, 1999

MEMO: To Whom It May Concern.

Re: United States Department of Agriculture (USDA) Directive.

The following information is supplied by TUFFLEX, Inc. in order to meet the criteria of the Food Safety and Inspection Service (FSIS) Division of the USDA, as per Directive Number 11,000.40 dated 8/12/94.

This directive concerns Paints & Coatings used in official (FSIS inspected) establishments.

Product identification -

TUFFLEX Primer No. 1 or 2.

TUFFLEX Resin Binder Concentrate (RBC) Solvent Free "SOFT".

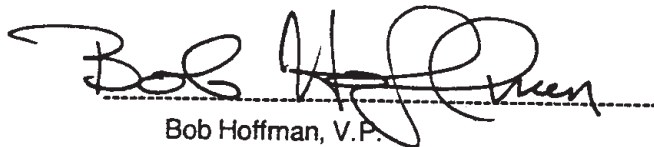
TUFFLEX Resin Binder Concentrate (RBC) Solvent Free "TUFF".

TUFFLEX Colorcoat AL - various color choices.

TUFFLEX Colorcoat AR - various color choices.

1. TUFFLEX, Inc. certifies that TUFFLEX products will not result in adulteration of food products if used and applied as intended or indicated on the label directions and/or application specifications.
2. TUFFLEX products will perform well under a daily regimen of rigorous cleaning, cyclical temperature change and wet conditions. TUFFLEX Systems are easy to sanitize because they are monolithic and non-porous. They can be finished in a smooth surface or with various degrees of slip-resistance depending on job needs.
3. TUFFLEX waterproofing systems are impervious to moisture.
4. TUFFLEX Systems can be finished in a variety of light solid colors that will not obscure detection of debris or unsanitary conditions.
5. TUFFLEX Systems cure to a monolithic polyurethane membrane and will not contain any known carcinogens, mutagens or teratogens classified as hazardous substances, heavy metals or other toxic substances.
6. TUFFLEX, Inc. does not produce any products that could be considered a pesticide or have pesticidal characteristics.

TUFFLEX, Inc. will provide the FSIS any requested information in a timely manner.


Bob Hoffman, V.P.

RAMTECH LABORATORIES, INC.

14104 ORANGE AVENUE, PARAMOUNT, CALIFORNIA 90723 • TELEPHONE (310) 633-4824 • FAX (310) 633-4128

Mr. Bob Hoffman
TUFFLEX[®], INC.
Unique Elastomeric Surfacing Solutions
14722 Spring Avenue
Santa Fe Springs, CA 90670

September 27, 1996

Laboratory No. 10672-96

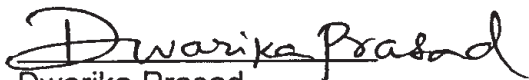
Dear Mr. Hoffman:

In compliance with your request the Factor of Friction Tests have been conducted on your submitted "Tufflex" sample. The tests were conducted in accordance with the procedure specified in the Military Standard Mil-D-24613.

The results of these tests are detailed on the following page.

Report Prepared By:

RAMTECH LABORATORIES, INC.



Dwarika Prasad
Senior Staff Engineer

DP/RAM/meza

Report Approved By:

RAMTECH LABORATORIES, INC.



Ronald A. Macey, P. E.,
Laboratory Director

Page 1 of 2 Pages

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ENGINEERING • MATERIAL TESTING

TUFFLEX[®], INC.
 Laboratory No. 10672-96
 Page 2 of 2 Pages

TEST RESULTS:

"TUFFLEX" SAMPLE WITH 16/20 GRITS

FACTORS OF FRICTION

Table No. 1

Contacting Surface	FACTOR OF STATIC FRICTION				FACTOR OF SLIDING FRICTION			
	Dry	Wet	Oily	Comments Passes/Fails	Dry	Wet	Oily	Comments Passes/Fails
Leather	0.91	0.81	-	Passes	0.76	0.53	-	Passes
Rubber	0.93	0.73	0.31	Passes	0.87	0.68	0.18	Passes
SPECIFICATION REQUIREMENTS MIL-D-24613, PARAGRAPH 3.11								
Leather	0.60	0.50	-	-	0.30	0.40	-	-
Rubber	0.60	0.70	0.30	-	0.40	0.70	0.10	-

***NOTE:** All results are average of six readings.



BOARD OF STEAMSHIP INSPECTION
CERTIFICATE OF APPROVAL

BUREAU D'INSPECTION DES NAVIRES À VAPEUR
CERTIFICAT D'APPROBATION

SCHEDULE - ANNEXE

1. The composition, density and other relevant properties of the **TUFFLEX SURFACING SYSTEM** are to be the same as those tested in accordance with ASTM E162 by the Warnock Hersey Professional Services Ltd., 211 Schoolhouse Street, Coquitlam, B.C. V3K 4X9 and described in their report No.6858 dated August 3, 1994 and "follow-up" letter to the test report dated October 17 1994.
- 2 The **TUFFLEX SURFACING SYSTEM** is classified and approved as "**NOT READILY IGNITABLE**" material.
- 3 The surface preparation and method of application are to be carried out in accordance with the manufacturer's instructions.
- 4 It is the responsibility of the manufacturer to ensure that the container in which the material is packed is identified with respect to its trade name and assigned fire rating.
- 5 The **TUFFLEX SURFACING SYSTEM** is to prove satisfactory in service.
- 6 This certificate may be suspended or cancelled if the manufacturer deviates from any of the conditions described herein without the prior consent of the Board of Steamship Inspection.
- 7 This approval is granted on the understanding that the Board of Steamship Inspection reserves the right to require check tests to be carried out on the **TUFFLEX SURFACING SYSTEM** at any time and that **TUFFLEX INC.** will accept full responsibility for informing shipowners, naval architects, shipbuilders and their sub-contractors of the methods of installing the underlayment and the conditions of this approval.





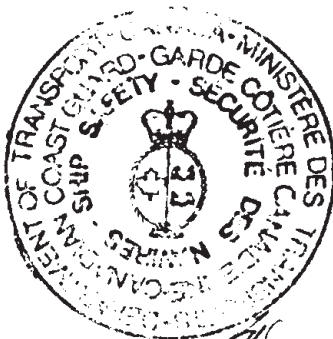
**BOARD OF STEAMSHIP INSPECTION
CERTIFICATE OF APPROVAL**

**BUREAU D'INSPECTION DES NAVIRES À VAPEUR
CERTIFICAT D'APPROBATION**

This certifies that the item specified herein has been approved by the Board of Steamship Inspection, in accordance with the provisions of the Canada Shipping Act and Regulations made thereunder.

Les présentes font foi que l'Article mentionné dans le présent certificat a été approuvé par le Bureau d'inspection des navires à vapeur, conformément aux dispositions de la Loi sur la marine marchande du Canada et de ses règlements d'exécution.

Issued to - Titulaire TUFFLEX INC. 14722 Spring Avenue Santa Fe Springs, CA 90679 USA
Item - L'article DECK COVERING - NON-FIRE RATED
Description "TUFFLEX SURFACING SYSTEM" deck covering manufactured and installed in accordance with the conditions described in the attached schedule.



Supercedes Certificate No.
Remplace l'approbation n°

The Certificate is valid until
Le présent certificat sera valide

October 18, 1999

Date of Issue
Date de délivrance

October 18, 1994

Signature

On behalf of the Board of Steamship Inspection
Pour le compte du Bureau d'inspection des navires à vapeur





Canadian
Coast Guard

Garde côtière
canadienne

Ship Safety Branch
344 Slater Street
11th Floor
Canada Building
Ottawa, Ontario
K1A 0N7

Your file *Voire référence*

Our file *Notre référence*

9406-19

October 18, 1994

TUFFLEX, INC.
14722 Spring Avenue
Santa Fe Springs, CA 90679
U.S.A.

Attention: Mr. Bob Hoffman

Subject: Application for Approval of TUFFLEX SURFACING SYSTEM.

Dear Mr. Hoffman,

Thank you for your letter dated September 26, 1994, together with copies of Test Report, which was submitted on your behalf by Mr Bill Seeber, to support your application for our approval of the above subject product.

On the basis of the satisfactory results of the tests which were conducted by Inchcape Testing Services on July 13, 1994 and the follow-up letter to the test report by the laboratory dated October 17, 1994, the TUFFLEX SURFACING SYSTEM has been approved for use on Canadian registered vessels as a **NOT READILY IGNITABLE** material.

The original of certificate No. E2-108 is enclosed and please be advised that an invoice in the amount of \$57.00 (Canadian) to cover the cost of issuing the certificates will be forwarded by our Financial Branch under separate correspondence.

Yours truly,

G. Watt,
(for) R. Smyth,
A/Director, Design & Construction.

Enclosure

c.c. Letter & Cert. No. E2-108 to Mr. W. R. Seeber
Tufflex, Inc.
Fax No. (604) 535-8989

c.c. AMSBA (C. Peters)

Canada

Tufflex Products

Colorcoat AL (#3)

Colorcoat AR

Resin Binder Catalyst

Tufflex Resin Binder "SF" "Tough"

Tufflex Resin Binder

Primer #2 Side A

Primer #2 Side B

Silver Tuff

Colourcoat Accelerator

Tuff-Binder

Color Coat AL (#3) SF

Colorcoat AR Catalyst



**WORKERS'
COMPENSATION
BOARD**
OF BRITISH
COLUMBIA

Mailing Address:

PO Box 5350
Vancouver BC V6B 5L5
Telephone: 273-2266

Location:

6951 Westminster Highway
Richmond BC V7C 1C8
Toll Free within BC: 1 800 661-2112

January 2, 1997

Tufflex
Mr. Bill Seeber
107-15282 19th Ave.
White Rock, B.C.
V4A 1X6

Dear Mr. Seeber,

We have reviewed the revised datasheets and labels for the attached list of Tufflex products. They are now in compliance with our Canadian WHMIS legislation - Controlled Products Regulations and Hazardous Product Act.

Please ensure that your customers (distributors and users) are given copies of your most up-to-date version of the MSDSs and labels for Tufflex products. Also, distribute this new information to those who have not made new purchases.

If you have any questions, please contact me at 276-3137.

Sincerely,

Mabel To
BC WHMIS Coordinator
Prevention Division
Workers' Compensation Board of BC

TEST REPORT

CLIENT

Tufflex, Inc.
107-15282, 19th Avenue
White Rock, B.C.
V4A 1X6

PRODUCT TESTED

Tufflex Polyurethane Elastomeric Surfacing System

TESTING PROTOCOL

1

Canadian Standards Association
S413-94

Test Standard for:
Parking Structures
(Appendix A: Moisture Barriers)

2

Canadian Construction Materials Centre
Masterformat Section: 07543

Technical Guide for:
Cold-Applied, Fluid, Elastomeric Roofing
(Exposed to Light, Pedestrian Traffic)

REPORTED BY:

INTERTEK TESTING SERVICES NA LTD.
WARNOCK HERSEY
211 SCHOOLHOUSE STREET
COQUITLAM, B.C.
V3K 4X9

REPORT NO: 488-0703

REPORT DATE: April 24, 1998



Intertek Testing Services NA Ltd.

211 Schoolhouse Street, Coquitlam, BC V3K 4X9 Canada
Telephone 604-520-3321 Fax 604-524-9186 Home Page www.worldlab.com

INTRODUCTION

At the request of Tufflex, Inc., the Coquitlam, B.C. branch of Intertek Testing Services NA Ltd./Warnock Hersey has conducted product evaluation testing on a cold fluid applied elastomeric roofing and waterproofing membrane in accordance with the following two testing protocols:

- 1. Canadian Standards Association S413-94 (Appendix A: Moisture Barriers)**
Testing required in appendix A of the S413-94 standard is references ASTM C957, the Standard Specification for: *High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface.*
- 2. Canadian Construction Materials Centre Masterformat Section: 07543**
Technical Guide for: *Cold-Applied, Fluid, Elastomeric Roofing (Exposed to Light, Pedestrian Traffic)*

Note: Where tests are required by both CSA and CCMC, it will be indicated in the test column under tests and test results.

The product tested was selected and sampled by a representative of Intertek Testing Services from the Tufflex warehouse located at 871 Belgrove Way, Delta, BC, V3M 5R8.

PRODUCT DESCRIPTION

Name: Tufflex Polyurethane Elastomeric Surfacing System

Two part cold fluid applied elastomeric roofing and waterproofing membrane with wearing surface.

Base coat applied first and allowed to partially cure.

25 mesh EPDM "broadcast" onto base coat 30 minutes into curing.

Two layers of top coat applied over cured base coat.

Two extra systems were tested for Abrasion Resistance:

1. The base coat was applied and allowed to cure.
30 mesh Silica was "broadcast" onto the first layer of top coat.
A second layer of top coat was applied over the cured first coat.
2. The base coat was applied and allowed to cure.
24 mesh AlO₂ was "broadcast" onto the first layer of top coat.
A second layer of top coat was applied over the cured first coat.

Note: For concrete samples, basecoat is applied at 40 mil dry thickness.
For plywood samples, basecoat is applied at 62 mil dry thickness.

TESTS AND TEST RESULTS

TEST	REQUIREMENT			RESULT	PASS/FAIL
Weight Loss (Base coat only)	Maximum weight loss after 72 hours: 40%			Wt. loss: 4.0%	Pass
Low Temp. Flexibility & Crack Bridging @ -26°C (Total system tested) CSA & CCMC rqmt.	Basecoat must bridge 1.6 mm wide crack without cracking			No cracking of base coat	Pass
Adhesion-in-peel after water immersion (Base coat only) CSA & CCMC rqmt.	Minimum peel resistance: 875 N/m on concrete and on plywood			Greater than 1750 N/m on concrete and plywood.	Pass
Chemical Resistance (Base coat only) CSA & CCMC rqmt.	Min. tensile strength retention required: After immersion in water: 70% After immersion in glycol: 70% After immersion in mineral spirits: 45%			Tensile retention: Water: 74% Glycol: 70% Mineral sp.: 80%	Pass Pass Pass
Chemical Resistance (Top coat only) CSA & CCMC rqmt.	Min. tensile strength retention required: After immersion in water: 70% After immersion in glycol: 70% After immersion in mineral spirits: 45%			Tensile retention: Water: 123% Glycol: 71% Mineral sp.: 99%	Pass Pass Pass
UV Weathering Resistance and Recovery from Elongation (Entire system tested)	Recovery from elongation: minimum 90% Tensile strength retention: minimum 80% Elongation retention: minimum 90%			Elong recov: 93% UTS retent: 140% Elong retent: 133%	Pass Pass Pass
Abrasion resistance (Entire system tested) CSA & CCMC rqmt.	Maximum weight loss after 1000 cycles with 1 Kg. weight: 50mg			With Silica texturing: 0 mg With AlO ₂ texturing: 0 mg With EPDM Texturing: 0 mg	Pass Pass Pass
Skid resistance EPDM in top surface (Entire system tested) Recommended by CSA Required by CCMC	Minimum sliding friction factors required.	With leather surface:	Dry: 0.50 Wet: 0.60	Dry: 0.63 Wet: 0.61	Pass Pass
		With rubber surface:	Dry: 0.70 Wet: 0.65	Dry: 0.80 Wet: 0.72	Pass Pass
Skid resistance AlO ₂ in top surface (Entire system tested) Recommended by CSA Required by CCMC	Minimum sliding friction factors required.	With leather surface:	Dry: 0.50 Wet: 0.60	Dry: 0.86 Wet: 0.81	Pass Pass
		With rubber surface:	Dry: 0.70 Wet: 0.65	Dry: 1.15 Wet: 0.91	Pass Pass

TESTS AND TEST RESULTS continued

TEST	REQUIREMENT	RESULTS	Pass/Fail
Dimensional Stability	Maximum change in dimension: 5%	Change: < 1 %	Pass
Water Absorption	Maximum absorption: 3%	Change: 3 %	Pass
Sag Flow	Maximum flow: 0.75mm	Flow: 0.21 mm	Pass
Static Puncture	Must withstand force of 245N @23°C without perforation	No perforation	Pass
Dynamic Impact	Must withstand impact of 4.9J without perforation	No perforation	Pass
Weathering resistance	Recovery from elongation: minimum 90% Tensile strength retention: minimum 80% Elongation retention: minimum 90%	Elong recov: 93% UTS retent: 108% Elong retent: 100%	Pass Pass Pass

CONCLUSION


The "Tufflex Polyurethane Elastomeric Surfacing System" described in this report has met all performance requirements of the following test standards:

1. CSA S413-Test Standard for parking Structures (Appendix A: Moisture barriers).
2. CCMC Technical Guide for: Cold-Applied, Fluid, Elastomeric Roofing (Exposed to Light Pedestrian Traffic:

The product has exhibited very high resistance to abrasion and UV weathering.


INTERTEK TESTING SERVICES NA LTD.
WARNOCK HERSEY

Tested by:



Geri Nishio
Technician
Building Sciences Division

Reviewed by:



Sheldon Warman, P.Eng.
Manager
Certification and Physical Testing

GN/cr



ICBO Evaluation Service, Inc.

5360 WORKMAN MILL ROAD • WHITTIER, CALIFORNIA 90601-2299

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EVALUATION REPORT

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ER-5204

Issued September 1, 1997

Filing Category: WEATHER-RESISTIVE BARRIERS (292)

POLYCOAT AND TUFFLEX® BELOW-GRADE AND CERAMIC TILE UNDERLAYMENT WATERPROOFING SYSTEMS

AMERICAN POLYMERS CORP.,
dba POLYCOAT PRODUCTS
14722 SPRING AVENUE
SANTA FE SPRINGS, CALIFORNIA 90670-5108

1.0 SUBJECT

Polycoat Aquagard®, Aquaseal® and Aquaseal® V Below-grade Dampproofing and Waterproofing Materials; and Polycoat Aquatight and Tufflex® Ceramic Tile Underlayment Waterproofing Systems.

2.0 DESCRIPTION

2.1 Below-grade Dampproofing and Waterproofing Materials:

2.1.1 General: Polycoat Aquagard and Aquaseal are liquid-applied dampproofing and waterproofing materials that cure to a monolithic, elastomeric membrane for use on the exterior of below-grade structures. The materials are applied with a brush, phenolic core roller or trowel. Nominal dry film thickness, thickness tolerances and hydrostatic pressure resistance are as noted in Table 1.

2.1.2 Materials:

2.1.2.1 Polycoat Aquagard: Polycoat Aquagard is a liquid-applied, 99-percent-solids, urethane membrane intended for use as dampproofing and waterproofing on below-grade concrete structures. Part A (black) and part B (blue) component materials are mixed in equal parts by volume. Aquagard is not diluted. Pot life is 20 minutes at 75°F (23°C). When mixed with black rubber granules (provided by Polycoat Products) to the consistency of paste, it may be used as a caulking for the Aquagard System. The product is available in 10-gallon (37.8 L) and 110-gallon (415.8 L) kits, and has a shelf life of 6 months from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.1.2.2 Polycoat Aquaseal: Polycoat Aquaseal is a liquid-applied, 98-percent-solids, urethane-bitumen modified membrane intended for use on concrete and concrete masonry units as dampproofing and waterproofing on below-grade structures. Part A (black) and part B (red/pink) component materials are mixed in equal parts by volume. Aquaseal is not diluted. Pot life is 20 minutes at 75°F (23°C). When mixed with black rubber granules (provided by Polycoat Products) to the consistency of paste, it may be used as a caulking for the Aquaseal system. Aquaseal is available in 10-gallon (37.8 L) and 110-gallon (415.8 L) kits, and has a shelf life of 6 months from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.1.2.3 Polycoat Aquaseal V: Aquaseal V is similar to Aquaseal except for the addition of thixotropy to the formulation, to increase viscosity.

2.1.2.4 Polyprime 21: Polyprime 21 is a two-part, 100-percent-solids, liquid-applied epoxy polyamine primer for application to substrates of concrete prior to application of the membrane. It is mixed in the ratio of A:B = 2:1 and may be diluted with MEK to levels indicated in the Polyprime 21 Technical Bulletin dated August 1997. The product is available in 3- or 15-gallon (11.3 or 56.8 L) kits, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.1.2.5 Polyprime 2140: Polyprime 2140 is similar to Polyprime 21 except it contains 40 percent solids. It is mixed in the ratio of A:B = 1:1. The product is available in 2- or 10-gallon (7.6 or 37.8 L) kits.

2.1.2.6 Poly-Ply Mat 3: Poly-Ply Mat 3 is a 3-ounce-per-square-yard (102 g/m²), non-woven, needle-punched polypropylene, geotextile mat that is embedded into the Aquagard and Aquaseal coatings. It is available in 36-inch-wide-by-360-foot-long (914 mm by 109.7 m) rolls.

2.1.2.7 Poly-Protection Mat 4: Poly-Protection Mat 4 is a 4-ounce-per-square-yard (136 g/m²), non-woven, needle-punched polypropylene, geotextile mat used as an outer protection mat for the Aquagard and Aquaseal systems, and is embedded into the wet final coat. It is available in 36-inch-wide-by-300-foot-long (914 mm by 91 440 mm) rolls.

2.1.2.8 Polyester Tape: The polyester tape is a 3-inch-wide (76 mm), spun bonded, non-woven, polyester-web tape, and is applied to the substrate to provide crack, joint and flashing reinforcement. It is available in 300-foot-long (91 440 mm) rolls.

2.1.2.9 Black Rubber Granules: The black rubber granules are provided by the manufacturer in 50 pound (22.7 kg) packages, and are mixed with Aquaseal or Aquagard to be used as caulking.

2.1.3 Application:

2.1.3.1 Polycoat Aquagard: Surfaces must be prepared in accordance with Appendix Chapter 18 of the code. Substrates must be dry, clean and free of all oils, greases and other contaminants. Membrane and primer products are not applied to frozen surfaces. Materials are not used on exposed or traffic-bearing surfaces.

All joints, cracks and flashings are covered with an Aquagard and black rubber granule mixture, then bridged with polyester tape which is embedded into the mixture. A thin coat of Aquagard material is further applied over the tape and smoothed onto the adjacent surface. The substrate is then coated with Polyprime 21 or 2140 at a coverage rate of 300

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This report is based upon independent tests or other technical data submitted by the applicant. The ICBO Evaluation Service, Inc., technical staff has reviewed the test results and/or other data, but does not possess test facilities to make an independent verification. There is no warranty by ICBO Evaluation Service, Inc., express or implied, as to any "Finding" or other matter in the report or as to any product covered by the report. This disclaimer includes, but is not limited to, merchantability.

square feet per gallon (7.35 m²/L). The primer is allowed to become almost tack-free before application of the Aquagard material. Aquagard is applied in three coats, with a coverage rate of 1.75 gallons per 100 square feet (0.7 L/m²), resulting in a dry-film thickness of 23 to 24 mils (0.61 mm) per coat, to the desired final thickness. Poly-Ply Mat 3 is embedded into the first two wet coats, with seams overlapped approximately 1/2 inch (12.7 mm). Poly-Protection Mat 4 is embedded into the final coat with the aid of a dry roller. On horizontal surfaces, subsequent coats may be applied immediately. On vertical surfaces, the surface is allowed to dry a minimum of 30 minutes before application of the next coat. Nominal final material thickness is 80 mils (2 mm). The membrane must cure a minimum of 4 hours prior to backfilling. The system shall not be exposed to direct sunlight longer than seven days.

2.1.3.2 Polycoat Aquaseal: Substrate preparation and application of Polycoat Aquaseal are performed in a fashion similar to that described for the Aquagard material. Nominal final material thickness is 80 mils (2 mm). The membrane must cure a minimum of 4 hours prior to backfilling. The system shall not be exposed to direct sunlight longer than seven days.

2.1.3.3 Polycoat Aquaseal V: Substrate preparation and application of Polycoat Aquaseal V is performed in a fashion similar to that described for the Aquaseal material.

2.2 Polycoat Aquatight Ceramic Tile Underlayment System:

2.2.1 General: Polycoat Aquatight is a liquid-applied waterproofing system that cures to a monolithic, elastomeric membrane for use as an underlayment for ceramic tile.

2.2.2 Materials:

2.2.2.1 PC-440 SF: PC-440 SF is a single-component, 93-percent-solids-by-weight, solvent-free, liquid-applied, moisture-cured polyurethane elastomeric base membrane. It is mixed with PC-50 Liquid Thickener/Accelerator in a ratio of 5 gallons (19 L) of PC-440 SF to maximum one quart (946 mL) of thickener. It is available in 5-gallon (19 L) containers, and has a shelf life of 6 months from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.2.2.2 PC-50 Liquid Thickener/Accelerator: PC-50 is a proprietary liquid catalyst used to accelerate and thicken the PC-440 SF membrane. It is available in 1-quart (946 mL) and 1-gallon (3.8 L) containers, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.2.2.3 Polyprime 21: Polyprime 21 is a two-part, liquid-applied, epoxy polyamine primer for application to substrates of concrete and plywood, prior to application of the membrane. It is mixed in the ratio of A:B = 2:1, and may be diluted with MEK to levels indicated in the Polyprime 21 Technical Bulletin dated August 1997. The product is available in 3- or 15-gallon (11.3 or 56.8 L) kits, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.2.2.4 Polyprime 2140: Polyprime 2140 is similar to Polyprime 21 except it contains 40 percent solids. It is mixed in the ratio of A:B = 1:1. The product is available in 2- or 10-gallon (7.6 or 37.8 L) kits.

2.2.2.5 Polyester Tape: Polyester tape is a 3-inch-wide (76 mm), spun bonded, non-woven, polyester-web tape, and is applied to the substrate to provide crack, joint and flashing reinforcement. It is available in 300-foot-long (91 440 mm) rolls.

2.2.2.6 Surface Texture: Surface texture is washed, dry, angular crystal silica sand, 16 grit [0.0469 inch (1.19 mm)] or larger, with minimum hardness of 6.5 Mohs.

2.2.3 Application:

Concrete and plywood substrates are prepared as described in Section 2.1.3.1 of this report. A layer of the PC-440 SF and PC-50 mixture is applied over all joints, cracks and flashings. Polyester tape is then embedded into the paste with a trowel or putty knife. An even coat of the membrane mixture is then brushed over all taped areas, and is allowed to dry for 6 to 8 hours prior to application of the basecoat.

The entire substrate is primed with Polyprime 21 at a coverage rate of 300 square feet per gallon (7.4 m²/L), applied by spray, brush or roller. When the primer is almost tack-free, the PC-440 SF/PC-50 mixture is applied evenly to the surface at a rate of 3 gallons per 100 square feet (1.2 L/m²), using a notched trowel, roller or spray equipment. The coating must cure for 6 to 8 hours, minimum. Dry coating thickness is approximately 40 mils (1.02 mm). A second coat is applied over the cured surface at a rate of 1 1/2 gallons per 100 square feet (0.6 L/m²). Surface texture described in Section 2.2.2.6 of this report is then immediately broadcast over the second coat, covering it completely. The membrane must cure a minimum of 24 hours before excess sand is removed and ceramic tile is applied. Final membrane thickness, without sand, is approximately 60 mils (1.5 mm). Ceramic tile must comply with ANSI A137.1. The membrane shall not be exposed to direct sunlight for more than 48 hours.

2.3 Tufflex Ceramic Tile Underlayment System:

2.3.1 General: The Tufflex system is a liquid-applied waterproofing system that cures to a monolithic, elastomeric membrane, for use as an underlayment for ceramic tile.

2.3.2 Materials:

2.3.2.1 Tufflex Primer #1: Primer #1 is a two-component, 100-percent-solids, liquid-applied, epoxy polyamine primer for application to concrete and plywood surfaces prior to application of membranes. It is available in 3-gallon (11.4 L) or 15-gallon (56.8 L) kits with an A:B mixing ratio of 2:1 by volume, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.3.2.2 Tufflex Primer #2: Primer #2 is a two-component, liquid-applied, polyamide epoxy resin primer for application to concrete and plywood surfaces prior to application of membranes. It is available in 2-gallon (7.6 L) or 10-gallon (37.8 L) kits with an A:B mixing ratio of 1:1 by volume, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.3.2.3 Tufflex RBC: RBC is a single-component, liquid-applied, water-catalyzed, polyurethane elastomeric membrane. The RBC is catalyzed with RBC Catalyst and potable water in a ratio of 3 ounces (89 mL) of catalyst to 1/2 gallon (1.9 L) of water to 2 gallons (7.6 L) of RBC basecoat. The RBC basecoat is available in 5-gallon (19 L) containers, and has a shelf life of six months from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.3.2.4 Tufflex RBC Catalyst: RBC Catalyst is a proprietary, organometallic catalyst used with the RBC membrane. It is available in 20-gram vials and 1-quart (946 mL) cans, and has a shelf life of one year from date of manufacture when stored in unopened containers at 75°F (23.8°C).

2.3.2.5 Straight Jacket Tape: The tape is a 4-inch-wide (102 mm), 20/20 mesh, fiberglass tape used for reinforcing cracks and joints in the substrate, and is available in 150-foot (45 720 mm) rolls.

2.3.2.6 Surface Texture: Surface texture is washed, dry, angular, crystal silica sand, 16 grit [0.0469 inch (1.19 mm)] or larger.

2.3.3 Application: Concrete and plywood substrates are prepared as noted in Section 2.1.3.1 of this report. RBC material is applied over all joints, cracks and flashings. Straight Jacket tape is then embedded into the coating with a trowel or putty knife.

The entire surface is primed with Tufflex #1 or Tufflex #2 primer at a coverage rate of 1 gallon per 300 to 400 square feet (0.14 to 0.1 L/m²). The primer is allowed to dry until slightly tacky, then the RBC base membrane mixture is applied uniformly over the surface at a rate of 2¹/₂ gallons per 100 square feet (1.0 L/m²). Approximate membrane thickness is 40 mils (1.02 mm). The base membrane must be sufficiently dry so that sand does not sink into the membrane. Surface texture as described in Section 2.3.2.6 of this report is then broadcast over the entire surface. The membrane must cure a minimum of 24 hours before application of ceramic tile. The membrane shall not be exposed to direct sunlight for more than 48 hours. Ceramic tile must comply with ANSI A137.1.

2.3.4 Method of Repair: Damaged areas are repaired by removing the membrane from an area extending 6 inches (152 mm) beyond the damage, cleaning the substrate with urethane-active solvent and applying the primer and membrane as described in Section 2.3.3 of this report.

2.4 Identification:

Each container bears a label with the Polycoat Products name and address, product name, expiration date and evaluation report number (ICBO ES ER-5204).

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with the ICBO ES Acceptance Criteria for Cold, Liquid-applied, Below Grade, Exterior Dampproofing and Waterproofing Materials (AC29), dated January 1994; reports of tests in accordance with the ICBO ES Acceptance Criteria for Waterproof Membranes Used as

Ceramic Tile Underlayment (AC115), dated July 1996; and installation instructions.

4.0 FINDINGS

That the Polycoat Aquagard and Aquaseal below-grade dampproofing and waterproofing systems and the Polycoat Aquatight and Tufflex ceramic tile underlayment systems described in this report comply with the 1994 *Uniform Building Code*[™], subject to the following conditions:

- 4.1 The materials are applied in accordance with this report and manufacturer's instructions, by contractors approved by the manufacturer.
- 4.2 Drainage is provided in accordance with Section 1824 of the code.
- 4.3 Prior to application, all below-grade substrates are prepared in accordance with Appendix Chapter 18 of the code.
- 4.4 Following application, the below-grade systems shall not be exposed to direct sunlight for more than seven days. Membranes for ceramic tile underlayment shall not be exposed to direct sunlight for more than 48 hours.
- 4.5 The materials are manufactured in Santa Fe Springs, California.

1996 Accumulative Supplement: This report is unaffected by the supplement.

This report is subject to re-examination in one year.

TABLE 1—ALLOWABLE HYDROSTATIC PRESSURE

MATERIAL	NOMINAL DRY-FILM THICKNESS (mils)	FILM THICKNESS TOLERANCE (mils)	ALLOWABLE HYDROSTATIC PRESSURE (psi)
Aquagard	80	+15/-5	17.5
Aquaseal	80	+15/-5	10

For SI: 1 inch = 25.4 mm, 1 psi = 6.89 kPa.

CITY OF LOS ANGELES
CALIFORNIA



RICHARD J. RIORDAN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY

400 CITY HALL
LOS ANGELES, CA 90012-4869

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LEE KANON ALPERT

Polycoat Products
14722 Spring Avenue
Santa Fe Springs, CA 90670-5108

Attn: Laxmi C. Gupta
(562) 802-8834

RESEARCH REPORT: RR 25329-A

BASED UPON ICBOES EVALUATION
REPORT NO. 5204

REEVALUATION DUE DATE:
December 1, 1998

GENERAL APPROVAL - Polycoat and Tufflex below-grade and ceramic tile underlayment waterproofing systems.

DETAILS

The above assemblies and/or products are approved when in compliance with the description, use, identification and findings of Report No. 5204, dated September, 1997, of the I.C.B.O. Evaluation Service, Incorporated. The report, in its entirety, is attached and made part of this general approval.

The above products are approved for use with the following conditions:

1. Each container bears a label with the Polycoat Products name and address, expiration date and evaluation report number (ICBO ES ER-5204).
2. The materials are applied in accordance with this report and manufacturer's instructions, by contractors approved by the manufacturer.
3. Drainage is provided in accordance with Section 7013 of the 1996 Los Angeles Building Code.
4. Following application, the below-grade systems shall not be exposed to direct sunlight for more than seven days. Membranes for ceramic tile underlayment shall not be exposed to direct sunlight for more than forty-eight hours.

DISCUSSION

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

RR 25329-A
Page 1 of 2



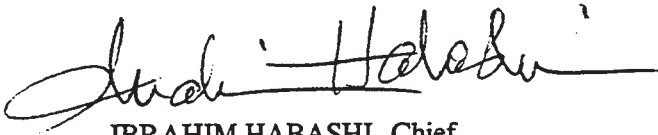
Polycoat Products

RE: Below-Grade Dampproofing and Waterproofing Material

This general approval will remain effective provided the Evaluation Report is maintained valid and unrevised with the issuing organization. Any revisions to the report must be submitted to this Department, with appropriate fee, for review in order to continue the approval of the revised report.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

APPROVED



IBRAHIM HABASHI, Chief
Engineering Research and Development Division

4/2 YC:sar
RR25329/D20/6.1
R11.6.97
2H6/1402.1

Attachment: ICBOES Evaluation Report No. 5204 (3 Pages).