TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX (883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX RESIN BINDER CONCENTRATE (RBC) SOLVENT FREE "TUFF"

Polyurethane elastomeric waterproofing membrane

1. PRODUCT NAME
TUFFLEX® RBC SOLVENT FREE "TUFF"

TUFFLEX® RBC SOLVENT FREE "TUFF" is a single-component, polyurethane waterproofing base membrane. **TUFFLEX®** RBC SOLVENT FREE "TUFF" is the base membrane in some of the **TUFFLEX®** Systems.

2. PRODUCT DESCRIPTION

2.1 Composition: **TUFFLEX®** RBC SOLVENT FREE "TUFF" is a single component, liquid applied, water catylized, polyurethane elastomeric waterproofing membrane.

2.2 Basic Uses: **TUFFLEX®** RBC SOLVENT FREE "TUFF" is the waterproofing base membrane used in some of the **TUFFLEX®** Decking Systems. When **TUFFLEX®** RBC SOLVENT FREE "TUFF" is incorporated into these systems, it waterproofs concrete and plywood decks, helicopter pads, parking structures, and areas that require a seamless membrane for protection against water damage.

2.3 Limitations: Containers that have been opened (but not mixed with water) must be used within one (1) or two (2) weeks, since **TUFFLEX®** RBC SOLVENT FREE "TUFF" is a moisture reactive material which sets up when exposed to air. **TUFFLEX®** RBC SOLVENT FREE "TUFF" may not be diluted under any circumstance. Surfaces to be coated with **TUFFLEX®** RBC SOLVENT FREE "TUFF" must be dry, clean, free of foreign matter, and primed **with TUFFLEX®** PRIMER #1 or #3.

2.4 Shelf Life: Six (6) months at 75^{0}F (24^{0}C) in sealed, unopened containers. White

2.6 Packaging: **TUFFLEX®** RBC SOLVENT FREE "TUFF" is available in five gallon (5 gallon or 18.9 liter) and fifty-five gallon (55 gallon or 208 liter) containers.

2.7 Standards: VOC less than 70 grams/liter. Meets or exceeds California rule 1113.

3. TECHNICAL DATA

(See table on reverse side)

4. INSTALLATION

4.1 All Surfaces:

a) All surfaces to receive **TUFFLEX®** RBC SOLVENT FREE "TUFF" must meet all applicable building and safety codes in the prescribed city, county or state, whichever has jurisdiction. Substrate must be structurally sound and sloped for proper drainage (see **TUFFLEX®** Guide Specifications for complete information). **NO LIABILITY IS ASSUMED BY MANUFACTURER FOR SUBSTRATE DEFECTS.**

b) Successful bonding requires structurally sound, strong, and clean substrates. The substrate must be cleaned to ensure that it is free of all oils, "laitances", greases and other contaminations, such as concrete curing compounds, that may cause poor adhesion of **TUFFLEX®** RBC SOLVENT FREE "TUFF". After cleaning, the surfaces should be rinsed thoroughly to remove loose particles and traces of the cleaning chemicals. Adhesives, sealing membranes, etc., should not be applied until the surface is dry.

4.2 Concrete:

a) Surface must be free of all loose particles and shall be without ridges, projections, voids, and concrete droppings that would be mechanically detrimental. All fins and projections must be ground smooth so that they are flush with the surrounding surface.

b) Surface must be free of all curing agents, bondbreakers, water-repellent coatings. hardeners, oils, greases, dust particles, or any foreign matter which will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "TUFF". Surface can be cleaned by sandblasting or shot blasting. Ensure that the surface is completely dry, clean, and has a neutral pH (pH of 7) after cleaning and before **TUFFLEX®** RBC SOLVENT FREE "TUFF" application.

c) Cracks, voids, and expansion joints must be prepared by inserting a backer rod, if necessary, and caulk with a thickened mixture of the RESIN BINDER.

d) Concrete Patching: Repairs to old or new concrete may be necessary to remove minor imperfections such as: ridges, sharp projections, pits, holes and low spots. All imperfections should be filled with the SAND SLURRY mixture (mix from 1 up to 3 parts clean sand with 1 part RESIN BINDER and 1/3 part water). Any repairs performed should be done after the concrete has been cleaned by the various cleaning methods listed above. This mixture may have the **TUFFLEX®** RBC SOLVENT FREE "TUFF" applied on top when the SAND SLURRY has hardened enough to step on without denting (approx. 1 hour depending on weather conditions.)

e) Concrete should be cured a minimum of twenty-eight (28) days with water or sodium silicate based cure only. Concrete shall be visibly dry and pass sixteen (16) hour ASTM 0-4263 test (4 mil or 102 microns polyethylene mat test) with no condensation prior to the application of **TUFFLEX®** RBC SOLVENT FREE "TUFF", Concrete shall have a minimum of 4000 psi (281 kg/cm^2) compressive strength. ALL surfaces shall be completed, clean, and free from structural defects prior to coating application. If this system must be applied prior to the suggested 28 days, refer to the advisory *"**TUFFLEX®** Waterproofing Membrane on Fresh Concrete".*

f) Surface must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "TUFF" application.

4.3 Plywood:

a) Plywood shall conform to U.S. Products Standard PS 1-66 and shall carry the grade trademark - American Plywood Association. Interior grades, including those with exterior glue, are not acceptable. Non roof and roof decks shall be APA Exterior A-C or better.

b) Plywood surface shall be clean, dry, sound, free of voids and protected from moisture and oxidation which may raise surface grain, cause checking or interfere with **TUFFLEX®** RBC SOLVENT FREE "TUFF" adhesion.

c) Plywood must be smooth, sanded, blocked, or tongue and groove, and a minimum of three quarter inch *(*3/4" or 1.6cm) thick.

d) Plywood should be installed with a maximum of one-eighth inch (1/8" or 0.16cm) space between the plywood sheets and laid over joists on sixteen inch (16" or 40.6cm) centers. Plywood sheets must be nailed down securely with coated annular ring or screw shank nails. The deck shall be designed to slope one-fourth inch (1/4" or 0.64cm) to the foot (30.5cm).

e) Damaged panels must be repaired or replaced prior to **TUFFLEX®** RBC SOLVENT FREE "TUFF" application.

f) Surface must be free of all varnishes, water-repellent coatings, paints, protective sealers, hot mops, dust particles, oils, greases or any other foreign matter which will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "TUFF".

g) Surface must be free of all projections and depressions.

i) Surface may be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "TUFF" application.

4.4 Flashing:

a) Flashing should be purchased from a reputable company and have a bonderized finish or be rough with sand paper.

b) All flashing should be installed in accordance with the accepted waterproofing techniques and government building codes.

c) Flashing must be nailed (annular coated ring nails) down flat and true, no buckling.

d) At all abutments and projections through the system caused by parapet walls, posts, vents, pipes, railings, and similar connected rigid items, provide one half inch (0.5" or 1.3cm) bead of thickened **TUFFLEX®**. Tool **TUFFLEX®** to form cove and allow to set up (gel) before applying **TUFFLEX®** RBC SOLVENT FREE "TUFF".

e) Metal must be free of all hot mops, oils, greases, dust particles, or any other foreign matter which will impair bonding of TUFFLEX RBC SOLVENT FREE "TUFF". Additionally, if the metal surface is rough, it will provide a stronger bonding surface. Flashing must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "TUFF" application.

4.5 Surface Acceptance: All surfaces shall be accepted by the authorized inspectors. Start of **TUFFLEX®** RBC SOLVENT FREE "TUFF" installation constitutes acceptance.

6. APPLICATION

5.1 General: **TUFFLEX®** RBC SOLVENT FREE "TUFF" requires a few precautions to be followed during and after application. Each application should be done in one complete step. Application should not be stopped part way across an area and then completed several or more hours later. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Any remaining material must be tightly sealed to protect it against curing in its container. Opened material must be used within 1 or 2 weeks (keep lid tightly secured.)

5.2 Joints. Cracks, and Flashing Reinforcement: Check area of application to ensure that it conforms to the above substrate requirements. Prime all joints. cracks, and flashings with **TUFFLEX®** PRIMER #1 or #3. Apply a two-part paste consisting of one gallon (1 gal) **TUFFLEX®** RBC SOLVENT FREE "TUFF" and one quart (1 qt.) water over all joints, cracks, and flashings. Bridge the joints, cracks, and flashings with 3" (7.6cm) polyester "TUFF" TAPE, pushing it into the sealant with a trowel. Over 3" (7.6cm) polyester "TUFF" TAPE apply a thin coat of **TUFFLEX®** RBC SOLVENT FREE "TUFF" and smooth onto adjacent surface, Allow thickened **TUFFLEX®** RBC SOLVENT FREE "TUFF" to cure for 30 to 60 minutes (depending on the weather conditions).

5.3 Application: Before application, mix **TUFFLEX®** RBC SOLVENT FREE "TUFF" by hand or using a mechanical mixer (Jiffy Mixer) at slow speeds. Mix **TUFFLEX®** RBC SOLVENT FREE "TUFF" with 25% water (by volume) until water is inducted into mixture (BMM: "Base Membrane Mixture".) *Note *Do not over mix or whip in air, 30 sec. to 1 min. is sufficient time to thoroughly induct the water.* For membrane thickness and spread rates, refer to the specific **TUFFLEX® "***Specification Sheets"*. Broadcast EPDM rubber granules immediately into the wet membrane or broadcast a #1 or #3 graded washed dry sand (20 mesh, 6.5 Moh's minimum hardness) after the membrane has set long enough so the sand does not sink, covering it completely, to provide a slip resistant surface (refer to **TUFFLEX®** Guide Specification for more information). Allow to cure 2 to 4 hours or until stiff enough to support weight before applying the colorcoat, tile or other surface coating. (Note: Curing time depends on humidity and temperature. Low temperature and low humidity retards or lengthens the curing time, Use RESIN BINDER CATALYST to shorten cure time. Refer to Technical Bulletins for their use).

5.4 Equipment Cleanup: Equipment should be cleaned with environmentally-safe solvent (as permitted under local regulations) immediately after use

6. AVAILABILITY

TUFFLEX® RBC SOLVENT FREE "TUFF" is marketed throughout the U.S.A. **TUFFLEX®,** INC. also supplies materials internationally. For distribution points nearest you, call **TUFFLEX®,** INC.

7. MAINTENANCE

If **TUFFLEX®** RBC SOLVENT FREE "TUFF" is damaged, it can be repaired by first abrading the surface six inches (6" or 15cm) around the damaged area. The surface should then be cleaned with an environmentally-safe solvent (as permitted under local regulations) to ensure that the surface is free of all dust particles, oils, greases, or any other foreign matter that will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "TUFF" . Allow the area to completely dry before priming the surface with **TUFFLEX® PRIMER** #1 or #3 and reapplying **TUFFLEX®** RBC SOLVENT FREE "TUFF".

8. TECHNICAL ASSISTANCE

Complete technical information and literature is available from **TUFFLEX®,** INC. and distributors. Technical assistance for specific application and application procedure are also available.

9. HEALTH PRECAUTIONS

The uncured components of **TUFFLEX®** RBC SOLVENT FREE "TUFF" can cause irritation to the eyes, skin, mucous membranes, and is harmful if swallowed. When handling, avoid contact with eyes and skin (especially open cuts). In case of contact. immediately wash off with plenty of water for at least fifteen (l5) minutes. For eyes, obtain medical attention. Always wash hands before eating. Obtain immediate medical attention in case of ingestion.

TUFFLEX® RBC SOLVENT FREE "TUFF" contains isocyanates and may cause allergic skin or respiratory reactions, Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying **TUFFLEX®** RBC SOLVENT FREE "TUFF" avoid breathing harmful vapors. Fresh air-supplied standard painter's hood or full face respirator must be worn by all personnel entering the area where **TUFFLEX®** RBC SOLVENT FREE "TUFF" is being applied until all vapors have been exhausted. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists causing: **cancer, birth detects, or other reproductive harm (Proposition 65).**

3. TECHNICAL DATA

Physical Property [units]	Test Method	Results
Hardness [Shore A]	ASTM D-2240	60-65
Tensile Strength [psi]	ASTM D-412	1,450
Ultimate Elongation [%]	ASTM D-412	**650%**
Tear Resistance [lbs/inch]	ASTM D-1004	168 pli
Water absorption by weight [%]	ASTM D-471	.05% by weight
Adhesion to substrate [psi]	ASTM C-903	175 pli
Solid Content By Volume	ASTM D-2369	89%
Temp Service Range	Fed Std 141, Meth 6223	-65^{o} to 200^{o} f

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX RESIN BINDER CONCENTRATE (RBC) SOLVENT FREE "SOFT"

Polyurethane elastomeric waterproofing membrane

1. PRODUCT NAME
TUFFLEX® RBC SOLVENT FREE "SOFT"

TUFFLEX® RBC SOLVENT FREE "SOFT" is a single-component, polyurethane waterproofing base membrane. **TUFFLEX®** RBC SOLVENT FREE "SOFT" is the base component in some of the **TUFFLEX®** Systems.

2. PRODUCT DESCRIPTION

2.1 Composition: **TUFFLEX®** RBC SOLVENT FREE "SOFT" is a single component, liquid applied, water catylized, polyurethane elastomeric waterproofing membrane.

2.2 Basic Uses: **TUFFLEX®** RBC SOLVENT FREE "SOFT" is the waterproofing base membrane used in some of the **TUFFLEX®** Decking Systems. When **TUFFLEX®** RBC SOLVENT FREE "SOFT" is incorporated into these systems, it waterproofs concrete and plywood decks, helicopter pads, parking structures, and areas that require a seamless membrane for protection against water damage.

2.3 Limitations: Containers that have been opened (but not mixed with water) must be used within one (1) or two (2) weeks, since **TUFFLEX®** RBC SOLVENT FREE "SOFT" is a moisture reactive material which sets up when exposed to air. **TUFFLEX®** RBC SOLVENT FREE "SOFT" may not be diluted under any circumstance. Surfaces to be coated with **TUFFLEX®** RBC SOLVENT FREE "SOFT" must be dry, clean, free of foreign matter, and primed **with TUFFLEX® PRIMER #1 or #3.**

2.4 Shelf Life: Six (6) months at 75^{0}F (24^{0}C) in sealed, unopened containers. White

2.6 Packaging: **TUFFLEX®** RBC SOLVENT FREE "SOFT" is available in five gallon (5 gallon or 18.9 liter) and fifty-five gallon (55 gallon or 208 liter) containers.

2.7 Standards: VOC less than 70 grams/liter. Meets or exceeds California rule 1113.

3. TECHNICAL DATA

(See table on reverse side)

4. INSTALLATION

4.1 All Surfaces:

a) All surfaces to receive **TUFFLEX®** RBC SOLVENT FREE "SOFT" must meet all applicable building and safety codes in the prescribed city, county or state, whichever has jurisdiction. Substrate must be structurally sound and sloped for proper drainage (see **TUFFLEX®** Guide Specifications for complete information). **NO LIABILITY IS ASSUMED BY MANUFACTURER FOR SUBSTRATE DEFECTS.**

b) Successful bonding requires structurally sound, strong, and clean substrates. The substrate must be cleaned to ensure that it is free of all oils, "laitances", greases and other contaminations, such as concrete curing compounds, that may cause poor adhesion of **TUFFLEX®** RBC SOLVENT FREE SOFT". After cleaning, the surfaces should be rinsed thoroughly to remove loose particles and traces of the cleaning chemicals. Adhesives, sealing membranes, etc., should not be applied until the surface is dry.

4.2 Concrete:

a) Surface must be free of all loose particles and shall be without ridges, projections, voids, and concrete droppings that would be mechanically detrimental. All fins and projections must be ground smooth so that they are flush with the surrounding surface.

b) Surface must be free of all curing agents, bondbreakers, water-repellent coatings. hardeners, oils, greases, dust particles, or any foreign matter which will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "SOFT" . Surface can be cleaned by sandblasting or shot blasting. Ensure that the surface is completely dry, clean, and has a neutral pH (pH of 7) after cleaning and before **TUFFLEX®** RBC SOLVENT FREE "SOFT" application.

c) Cracks, voids, and expansion joints must be prepared by inserting a backer rod, if necessary, and caulk with a thickened mixture of the RESIN BINDER (RBC).

d) Concrete Patching: Repairs to old or new concrete may be necessary to remove minor imperfections such as: ridges, sharp projections, pits, holes and low spots. All imperfections should be filled with the SAND SLURRY mixture (mix from 1 up to 3 parts clean sand with 1 part RESIN BINDER and 1/3 part water). ***Note:** *It is suggested that SOLVENT FREE "TUFF" and sand be used for major repair areas.* Any repairs performed should be done after the concrete has been cleaned by the various cleaning methods listed above. This mixture may have the **TUFFLEX®** RBC SOLVENT FREE "SOFT" applied on top when the SAND SLURRY has hardened enough to step on without denting (approx. 1 hour depending on weather conditions.)

e) Concrete should be cured a minimum of twenty-eight (28) days with water or sodium silicate based cure only. Concrete shall be visibly dry and pass sixteen (16) hour ASTM 0-4263 test (4 mil or 102 microns polyethylene mat test) with no condensation prior to the application of **TUFFLEX®** RBC SOLVENT FREE "SOFT", Concrete shall have a minimum of 4000 psi (281 kg/cm^2) compressive strength. ALL surfaces shall be completed, clean, and free from structural defects prior to coating application. If this system must be applied prior to the suggested 28 days, refer to the advisory *"**TUFFLEX®** Waterproofing Membrane on Fresh Concrete".*

f) Surface must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "SOFT" application.

4.3 Plywood:

a) Plywood shall conform to U.S. Products Standard PS 1-66 and shall carry the grade trademark - American Plywood Association. Interior grades, including those with exterior glue, are not acceptable. Non-roof and roof decks shall be APA Exterior A-C or better.

b) Plywood surface shall be clean, dry, sound, free of voids and protected from moisture and oxidation which may raise surface grain, cause checking or interfere with **TUFFLEX®** RBC SOLVENT FREE "SOFT" adhesion.

c) Plywood must be smooth, sanded, blocked, or tongue and groove, and a minimum of three quarter inch *(3/4"* or 1.6cm) thick.

d) Plywood should be installed with a maximum of one-eighth inch (1/8" or 0.16cm) space between the plywood sheets and laid over joists on sixteen inch (16" or 40.6cm) centers. Plywood sheets must be nailed down securely with coated annular ring or screw shank nails. The deck shall be designed to slope one-fourth inch (1/4" or 0.64cm) to the foot (30.5cm).

e) Damaged panels must be repaired or replaced prior to **TUFFLEX®** RBC SOLVENT FREE "SOFT" application.

f) Surface must be free of all varnishes, water-repellent coatings, paints, protective sealers, hot mops, dust particles, oils, greases or any other foreign matter which will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "SOFT"

g) Surface must be free of all projections and depressions.

h) Cracks, joints at different levels, or expansion details must be prepared by inserting a backer rod, if necessary, and caulking or a thickened mixture of the RESIN BINDER (RBC).

i) Surface may be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "SOFT" application.

4.4 Flashing:

a) Flashing should be purchased from a reputable company and have a bonderized finish.

b) All flashing should be installed in accordance with the accepted waterproofing techniques and government building codes.

c) Flashing must be nailed (annular coated ring nails) down flat and true, no buckling.

d) At all abutments and projections through the system caused by parapet walls, posts, vents, pipes, railings, and similar connected rigid items, provide one half inch (0.5" or 1.3cm) bead of thicken RBC. Tool RBC mixture to form cove and allow to set up (gel) before applying **TUFFLEX®** RBC SOLVENT FREE "SOFT".

e) Metal must be free of all hot mops, oils, greases, dust particles, or any other foreign matter which will impair bonding of TUFFLEX RBC SOLVENT FREE "SOFT". Additionally, if the metal surface is rough, it will provide a stronger bonding surface. Flashing must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC SOLVENT FREE "SOFT" application.

4.5 Surface Acceptance: Liability and acceptance of surface conditions fall solely on the on-site contractor/installer. Start of **TUFFLEX®** RBC SOLVENT FREE "SOFT" installation constitutes acceptance.

6. APPLICATION

5.1 General: **TUFFLEX®** RBC SOLVENT FREE "SOFT" requires a few precautions to be followed during and after application. Each application should be done in one complete step. Application should not be stopped part way across an area and then completed several or more hours later. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Any remaining material must be tightly sealed to protect it against curing in its container. Opened material must be used within 1 or 2 weeks (keep lid tightly secured.)

5.2 Joints. Cracks, and Flashing Reinforcement: Check area of application to ensure that it conforms to the above substrate requirements. Prime all joints. cracks, and flashings with **TUFFLEX®** PRIMER #1 or #3. Apply a two-part paste consisting of one gallon (1 gal) **TUFFLEX®** RBC SOLVENT FREE "SOFT" and one quart (1 qt.) water over all joints, cracks, and flashings. Bridge the joints, cracks, and flashings with 3" (7.6cm) polyester "TUFF" TAPE, pushing it into the sealant with a trowel. Over 3" (7.6cm) polyester "TUFF" TAPE apply a thin coat of **TUFFLEX®** RBC SOLVENT FREE "SOFT" and smooth onto adjacent surface, Allow thickened **TUFFLEX®** RBC SOLVENT FREE "SOFT" to cure for 30 to 60 minutes (depending on the weather conditions).

5.3 Application: Before application, mix **TUFFLEX®** RBC SOLVENT FREE "SOFT" by hand or using a mechanical mixer (Jiffy Mixer) at slow speeds. Mix **TUFFLEX®** RBC SOLVENT FREE "SOFT with 25% water (by volume) until water is inducted into mixture (BMM: "Base Membrane Mixture"), *Note *Do not over mix or whip in air, 30 sec. to 1 min. is sufficient time to thoroughly induct the water.* For membrane thickness and spread rates, refer to the specific **TUFFLEX®** *Specification* Sheets. Broadcast EPDM rubber granules immediately into the wet membrane or broadcast a #1 or #3 graded washed dry sand (20 mesh, 6.5 Moh's minimum hardness) after the membrane has set long enough so the sand does not sink, covering it completely, to provide a slip resistant surface (refer to **TUFFLEX®** Guide Specification for more information). Allow to cure 2 to 4 hours or until stiff enough to support weight before applying the colorcoat, tile or other surface coating. (Note: Curing time depends on humidity and temperature. Low temperature and low humidity retards or lengthens the curing time, Use RESIN BINDER CATALYST to shorten cure time. Refer to Technical Bulletins for their use).

5.4 Equipment Cleanup: Equipment should be cleaned with environmentally-safe solvent (as permitted under local regulations) immediately after use

6. AVAILABILITY

TUFFLEX® RBC SOLVENT FREE "SOFT" is marketed throughout the U.S.A. **TUFFLEX® INC**. also supplies materials internationally. For distribution points nearest you, call **TUFFLEX®, INC.**

7. MAINTENANCE

If **TUFFLEX®** RBC SOLVENT FREE"SOFT" is damaged, it can be repaired by first abrading the surface six inches (6" or 15cm) around the damaged area, The surface should then be cleaned with an environmentally-safe solvent (as permitted under local regulations) to ensure that the surface is free of all dust particles, oils, greases, or any other foreign matter that will impair bonding of **TUFFLEX®** RBC SOLVENT FREE "SOFT" . Allow the area to completely dry before priming the surface with **TUFFLEX® PRIMER** #1 or #3 and reapplying **TUFFLEX®** RBC SOLVENT FREE "SOFT".

8. TECHNICAL ASSISTANCE

Complete technical information and literature is available from **TUFFLEX®, INC.** and distributors. Technical assistance for specific application and application procedure are also available.

9. HEALTH PRECAUTIONS

The uncurred components of **TUFFLEX®** RBC SOLVENT FREE "SOFT" can cause irritation to the eyes, skin, mucous membranes, and is harmful if swallowed. When handling, avoid contact with eyes and skin (especially open cuts). In case of contact. immediately wash off with plenty of water for at least fifteen (l5) minutes. For eyes, obtain medical attention. Always wash hands before eating. Obtain immediate medical attention in case of ingestion.

TUFFLEX® RBC SOLVENT FREE "SOFT contains isocyanates and may cause allergic skin or respiratory reactions, Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying

TUFFLEX® RBC SOLVENT FREE "SOFT" avoid breathing harmful vapors. Fresh air-supplied standard painter's hood or full face respirator must be worn by all personnel entering the area where **TUFFLEX®** RBC SOLVENT FREE "SOFT" is being applied until all vapors have been exhausted. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. For additional health and safety information consult the Material Safety Data Sheet. THIs product may contain chemicals whIch the State of California lists causing: **cancer, birth detects, or other reproductive harm (Proposition 65).**

3. TECHNICAL DATA

Physical Property [units]	Test Method	Results
Hardness [Shore A]	ASTM D-2240	35
Tensile Strength [psi]	ASTM D-412	900 psi
Ultimate Elongation [%]	ASTM D-412	**800%**
Tear Resistance [lbs/inch]	ASTM D-1004	90 pli
Water absorption by weight [%]	ASTM D-471	.05% by weight
Adhesion to substrate [psi]	ASTM C-903	175 pli
Solid Content By Volume	ASTM D-2369	89%
Temp Service Range	Fed Std 141, Meth 6223	-65°to 200° F

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX RESIN BINDER CONCENTRATE STANDARD OUTDOOR (w/Solvent)

Polyurethane elastomeric waterproofing membrane

1. PRODUCT NAME
TUFFLEX® RBC OUTDOOR

TUFFLEX® RBC OUTDOOR is a single-component, polyurethane waterproof-ing base membrane. **TUFFLEX®** RBC OUTDOOR is the primary component of some of the **TUFFLEX®** Waterproofing Systems.

2. PRODUCT DESCRIPTION

2.1 Composition: **TUFFLEX®** RBC OUTDOOR is a single component, liquid applied, moisture-cured, polyurethane elastomeric waterproofing membrane.

2.2 Basic Uses: **TUFFLEX®** RBC OUTDOOR is the waterproofing base membrane used in some of the **TUFFLEX®** Decking Systems. When **TUFFLEX®** RBC OUTDOOR is incorporated into these systems, it waterproofs concrete and plywood decks, helicopter pads, parking structures, and areas that require a seamless membrane for protection against water damage. **TUFFLEX®** RBC OUTDOOR is an excellent base under layment for waterproofing beneath tiles.

2.3 Limitations: Containers that have been opened (but not mixed with water) must be used within one (1) or two (2) weeks, since **TUFFLEX®** RBC OUTDOOR is a moisture reactive material which sets up when exposed to air. **TUFFLEX®** RBC OUTDOOR may not be diluted under any circumstance. Surfaces to be coated with **TUFFLEX®** RBC OUTDOOR must be dry, clean, free of foreign matter, and primed **with TUFFLEX®** PRIMER #1 or #3.

2.4 Shelf Life: Six (6) months at 75^{0}F (24^{0}C) in sealed, unopened containers.

2.5 Colors: White - Custom colors available: Minimum order of 300 gallons (136 liters). Color chart for custom colors must be provided by customer.

2.6 Packaging: **TUFFLEX®** RBC OUTDOOR is available in five gallon (5 gallon or 18.9 liter) and fifty-five gallon (55 gallon or 208 liter)containers.

2.7 Standards: VOC less than 70 grams/liter. Meets or exceeds California rule 1113.

3. TECHNICAL DATA

(See table on reverse side)

4. INSTALLATION

4.1 All Surfaces:

a) All surfaces to receive **TUFFLEX®** RBC OUTDOOR must meet all applicable building and safety codes in the prescribed city, county or state, whichever has jurisdiction. Substrate must be structurally sound and sloped for proper drainage (see **TUFFLEX®** Guide Specifications for complete information). **NO LIABILITY IS ASSUMED BY MANUFACTURER FOR SUBSTRATE DEFECTS.**

b) Successful bonding requires structurally sound, strong, and clean substrates. The substrate must be cleaned to ensure that it is free of all oils, "laitances", greases and other contaminations, such as concrete curing compounds, that may cause poor adhesion of **TUFFLEX®** RBC OUTDOOR. After cleaning, the surfaces should be rinsed thoroughly to remove loose particles and traces of the cleaning chemicals. Adhesives, sealing membranes, etc., should not be applied until the surface is dry.

4.2 Concrete:

a) Surface must be free of all loose particles and shall be without ridges, projections, voids, and concrete droppings that would be mechanically detrimental. All fins and projections must be ground smooth so that they are flush with the surrounding surface.

b) Surface must be free of all curing agents, bondbreakers, water-repellent coatings. hardeners, oils, greases, dust particles, or any foreign matter which will impair bonding of **TUFFLEX®** RBC OUTDOOR. Surface can be cleaned by sandblasting, shot blasting, or acid etching. Ensure that the surface is completely dry, clean, and has a neutral pH (pH of 7) after cleaning and before **TUFFLEX®** RBC OUTDOOR application.

c) Cracks, voids, and expansion joints must be prepared by inserting a backer rod, if necessary, and caulk with a thickened mixture of the RESIN BINDER mixture.

d) Concrete Patching: Repairs to old or new concrete may be necessary to remove minor imperfections: ridges, sharp projections, pits, holes and low spots. All imperfections should be filled with the SAND SLURRY mixture (mix from 1 up to 3 parts clean sand with 1 part RESIN BINDER and 1/3 part water). ***Note:** *It is suggested that the SOLVENT FREE "TUFF" and sand be used for major repair areas.* Any repairs performed should be done after the concrete has been cleaned by the various cleaning methods listed above.and then properly primed with PRIMER #1 or #3. The SAND SLURRY mixture should be allowed to harden enough for light foot traffic, without denting approx. 1 hour (depending on weather conditions).

e) Concrete should be cured a minimum of twenty-eight (28) days with water or sodium silicate based cure only. Concrete shall be visibly dry and pass sixteen (16) hour ASTM D-4263 test (4 mil or 102 microns polyethylene mat test) with no condensation prior to the application of **TUFFLEX®** RBC OUTDOOR. Concrete shall have a minimum of 4000 psi (281 kg/cm^2) compressive strength. If this system must be applied prior to the suggested 28 days, refer to the advisory "**TUFFLEX®** Waterproofing Membrane on Fresh Concrete".

f) Surface must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC OUTDOOR application.

4.3 Plywood:

a) Plywood shall conform to U.S. Products Standard PS 1-66 and shall carry the grade trademark - American Plywood Association. Interior grades, including those with exterior glue, are not acceptable. Non roof and roof decks shall be APA Exterior A-C or better.

b) Plywood surface shall be clean, dry, sound, free of voids and protected from moisture and oxidation which may raise surface grain, cause checking or interfere with **TUFFLEX®** RBC OUTDOOR adhesion.

c) Plywood must be smooth, sanded, blocked, or tongue and groove, and a minimum of three quarter inch (3/4" or 2.1cm) thick.

d) Plywood should be installed with a maximum of one-eighth inch (1/8" or 0.16cm) space between the plywood sheets and laid over joists on sixteen inch (16" or 40.6cm) on centers. If plywood is pre-existing, saw cut or route each seam halfway through the sheeting to create a simulated space. Plywood sheets must be nailed down securely with coated annular ring or screw shank nails. The deck shall be designed to slope one-fourth inch (1/4" or 0.64cm) to the foot (30.5cm).

e) Damaged sheeting must be repaired or replaced prior to **TUFFLEX®** RBC OUTDOOR application.

f) Surface must be free of all varnishes, water-repellent coatings, paints, protective sealers, hot mopscoatings, dust particles, oils, greases or any other foreign matter which will impair bonding of **TUFFLEX®** RBC OUTDOOR.

g) Surface must be free of all projections and depressions.

h) Cracks, joints at different levels or expansion details must be prepared by

inserting a backer rod, if necessary, and caulking flush. Caulking material m must be extended a minimum distance of 2" (5.1cm) on either side of crack to yield a 30 ± 2 dry mil (792 ± 51 micron) thickness.

i) Surface may be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC OUTDOOR application.

4.4 Flashing:

a) Flashing should be purchased from a reputable company and have a bonderized finish or be rough with sand paper.

b) All flashing should be installed in accordance with the accepted waterproofing techniques and government building codes.

c) Flashing must be nailed (annular coated ring nails) down flat and true, no buckling.

d) At all abutments and projections through the system caused by parapet walls, posts, vents, pipes, railings, and similar connected rigid items, provide one sealant. Tool sealant to form cove and allow to completely cure before applying **TUFFLEX®** RBC OUTDOOR.

e) Metal must be free of all hot mop coatings, oils, greases, dust particles, or any other foreign matter which will impair bonding of **TUFFLEX®** RBC OUTDOOR. Additionally, if the metal surface is rough, it will provide a stronger bonding surface. Flashing must be primed with **TUFFLEX®** PRIMER #1 or #3 prior to **TUFFLEX®** RBC OUTDOOR application.

4.5 Surface Acceptance: Liability and acceptance of surface conditions fall solely on the on-site contractor/installer. Start of **TUFFLEX®** RBC OUTDOOR installation constitutes acceptance.

6. APPLICATION

5.1 General: **TUFFLEX®** RBC OUTDOOR requires a few precautions to be followed during and after application. Each application should be done in one complete step. Application should not be stopped part way across an area and then completed several or more hours later. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Any remaining material must be tightly sealed to protect it against curing in its container. Opened material, not mixed with water, must be used within one (1) to two (2) weeks (keep lid tightly secured.)

5.2 Joints. Cracks, and Flashing Reinforcement: Cracks over one-sixteenth inch (0.0625" or 0.16cm) shall be routed before reinforcing. Check area of application to ensure that it conforms to the above substrate requirements. Prime all joints. cracks, and flashings with **TUFFLEX®** PRIMER #1 or #3. Apply a two-part paste consisting of one gallon (1 gal) **TUFFLEX®** RBC OUTDOOR and one quart (1 qt.) water over all joints, cracks, and flashings. Bridge the joints, cracks, and flashings with 3" (7.6cm) POLYESTER TAPE, pushing it into the sealant with a trowel. Over 3" (7.6cm) polyester TAPE apply a thin coat of **TUFFLEX®** RBC OUTDOOR and smooth onto adjacent surface, Allow thickened **TUFFLEX®** RBC OUTDOOR to cure for 30 minutes to 1 hour, depending on the weather conditions).

5.3 Application: Before application, mix **TUFFLEX®** RBC OUTDOOR using a mechanical mixer (Jiffy Mixer) at slow speeds or mix for at least five (5) minutes, if mixed by hand. Mix **TUFFLEX®** RBC OUTDOOR thoroughly until a homogeneous mixture and color is obtained. Mix **TUFFLEX®** RBC OUTDOOR with 25% water (by volume) until water is inducted into mixture (BMM: "Base Membrane Mixture"), *Note *Do not over mix or whip in air, 30 sec. to 1 min. is sufficient time to thoroughly induct the water.* For membrane thickness and spread rates, refer to the specific **"***Specification Sheets"*. Broadcast EPDM rubber granules immediately into the wet membrane or broadcast a #1 or #3 graded washed dry sand (20 mesh, 6.5 Moh's minimum hardness) after the membrane has set long enough so the sand does not sink, covering it completely, to provide a slip resistant surface (refer to **TUFFLEX®** Guide Specification for more information). Allow to cure 2 to 4 hours or until stiff enough to support weight without denting, before applying the Colorcoat, tile or other surface coating. (Note: Curing time depends on humidity and temperature. Low temperature and low humidity retards or lengthens the curing time, Use RESIN BINDER CATALYST to shorten cure time. Refer to Technical Bulletins for their use).

5.4 Equipment Cleanup: Equipment should be cleaned with environmentally-safe solvent (as permitted under local regulations) immediately after use

6. AVAILABILITY

TUFFLEX® RBC OUTDOOR is marketed throughout the U.S.A. **TUFFLEX®, INC.** also supplies materials internationally. For distribution points nearest you, call **TUFFLEX®, INC.**

7. MAINTENANCE

TUFFLEX® RBC OUTDOOR is damaged, it can be repaired by first abrading the surface six inches (6" or 15cm) around the damaged area. The surface should then be cleaned with an environmentally-safe solvent (as permitted under local regulations) to ensure that the surface is free of all dust particles, oils, greases, or any other foreign matter that will impair bonding of **TUFFLEX®** RBC OUTDOOR. Allow the area to completely dry before priming the surface with **TUFFLEX® PRIMER** #1 or #3 and reapplying **TUFFLEX®** RBC OUTDOOR

8. TECHNICAL ASSISTANCE

Complete technical information and literature is available from **TUFFLEX®,** INC. and distributors. Technical assistance for specific application and application procedure are also available.

9. HEALTH PRECAUTIONS

The uncured components of **TUFFLEX®** RBC OUTDOOR can cause irritation to the eyes, skin, mucous membranes, and is harmful if swallowed. When handling, avoid contact with eyes and skin (especially open cuts). In case of contact. immediately wash off with plenty of water for at least fifteen (I5) minutes. For eyes, obtain medical attention. Always wash hands before eating. Obtain immediate medical attention in case of ingestion.

TUFFLEX® RBC OUTDOOR contains isocyanates and may cause allergic skin or respiratory reactions, Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors.

When applying **TUFFLEX®** RBC OUTDOOR avoid breathing harmful vapors. Fresh air-supplied standard painter's hood or full face respirator must be worn by all personnel entering the area where **TUFFLEX®** RBC OUTDOOR is being applied until all vapors have been exhausted. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. For additional health and safety information consult the Material Safety Data Sheet. **This product may contain chemicals which the State of California lists causing: cancer, birth detects, or other reproductive harm (Proposition 65).**

3. TECHNICAL DATA

Physical Property [units]	Test Method	Results
Hardness [Shore A]	ASTM D-2240	55-60
Tensile Strength [psi]	ASTM D-412	1598
Ultimate Elongation [%]	ASTM D-412	**879**
Tear Resistance [lbs/inch]	ASTM D-1004	214
Water absorption by weight [%]	ASTM D-471	.05% by weight
Moisture vapor transmission [perms]	ASTM C-372	175 pli
Temp Service Range	Fed Std 141, Meth 6223	-65° to 200° F

THIS PUBLICATION SUPERSEDES ALL OTHERS RBCOUTDOOR.PM65 - APRIL 2002

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

RESIN BINDER CATALYST

PRODUCT DESCRIPTION

COMPOSITION: RESIN BINDER CATALYST is a single component, proprietary, organometallic catalyst which reduces the cure time of moisture-cured urethane coatings in cold weather.

BASIC USES: RESIN BINDER CATALYST may be added to all **TUFFLEX®** RESIN BINDER CONCENTRATES (TUFF, SOFT, OUTDOOR) before their application. This accelerated mixture, helps the coatings cure (under the influence of heat and moisture) to a perfectly homogenous and blister-free coating **at a very fast rate.**

COLOR: Pink.

PACKAGING: RESIN BINDER CATALYST is available in 20 gram (0.7 ounce), 0.95 liter (1 quart) or 3.78 liters (1 gallon) containers.

PRE-APPLICATION PRECAUTION

LIMITATIONS: Adding excessive amounts of RESIN BINDER CATALYST may result in foaming and degradation of rubber upon aging. No more than 0.1% to 0.3% of RESIN BINDER CATALYST should be added by weight to the **TUFFLEX®** RESIN BINDER CONCENTRATE or 25cc to 75cc per 18.9 liter (1 oz. to 3 oz. per 5 gallon) container.

EXCESSIVE ADDITION OF RESIN BINDER CATALYST MAY ALSO RESULT IN A DRASTIC REDUCTION IN PHYSICAL PROPERTIES. CAUSING THE CURED MEMBRANE TO CRACK AND DEGRADE.

In cold weather conditions the accelerated mixture must be used within a 2 to 4 hour time period, dependent on weather conditions.

PRECAUTION: RESIN BINDER CATALYST is a component of the **TUFFLEX®** Decking Systems. It should primarily be used as stipulated in these guide specifications. Results occurring from use other than what is stipulated in these guide specifications are not tested or guaranteed by **TUFFLEX®**, INC.

Ensure that the decking system is properly prepared prior to application.

APPLICATION

GENERAL: The RESIN BINDER CONCENTRATE accelerated with RESIN BINDER CATALYST requires a few precautions to be followed during and after application. Each application should be done in one complete step A continuous applicatIon will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later.

MIXING INSTRUCTIONS: The amount of catalyst to be added must be determined according to job conditions. However, it is recommended that 0.1% to 0.2% of RESIN BINDER CATALYST be added by weight to the **TUFFLEX®** RESIN BINDER CONCENTRATE or 25cc to 50cc per 19 liter (1 oz. to 2 oz. per 5 gallon) container, RESIN BINDER CATALYST may be mixed into the coating using a mechanical mixer (Jiffy Mixer) on low speed or mixed for at least 2 minutes, if mixed by hand. Material should be mixed thoroughly being careful not to allow entrapment of air into the mixture. Mix until the entire contents appear uniform.

APPLICATION: TUFFLEX® RESIN BINDER CONCENTRATE accelerated with RESIN BINDER CATALYST can be applied as de scribed in the TUFFLEX~ RESIN BINDER CONCENTRATE Technical Bulletins.

CURING: Under optimum conditions, material will be ready for light traffic within 2 to 3 hours and heavy traffic within 24 hours. Note: RESIN BINDER CATALYST is appropriate for use in cold temperatures and low humidity weather conditions. Temperature will affect the curing time of the RESIN BINDER CATALYST mixture. Higher temperatures will significantly accelerate the cure time while colder temperatures will retard the cure time. In hot temperatures, the pot life is significantly reduced, therefore the working time should be very short. Recommended application temperature is 24°C (75°F). Good ventilation, however, will reduce drying time by dissipating solvents in the top coats. In areas with limited air circulation forced air ventilation is strongly recommended.

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations, immediately after use.

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes, respiratory tract, and maybe harmful if swallowed. When handling, avoid contact with eyes and skin (especially open cuts), Wear protective clothing, gloves, goggles, etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reactions, Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respirator with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. **This product may contain chemicals which the State of California lists as causing: cancer, birth defects, or other reproductive harm (Proposition 66).**

TECHNICAL DATA

Physical Property	Test Method	Results
Pot Life (during application)		15 - 20 minutes
Shelf Life		1 year
Specific Gravity		1.008
Total Solids by Weight	ASTM D-2369	100%
Total Solids by Volume	ASTM D-2697	100%
Viscosity at 24°C (75°F)		100 ± 50 centipoises
Volatile Organic Compounds	ASTM D-2369-81	0.0 g/l

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX PRIMER #1

PRODUCT DESCRIPTION

COMPOSITION: TUFFLEX® PRIMER #1 is a 2 component, 100% solids, liquid applied, epoxy-polyamine primer. The special polyamine modified with amine adduct gives unique penetrating characteristics. It has low viscosity and excellent adhesion to various surfaces and basecoats.

BASIC USES: TUFFLEX® PRIMER #1 is an epoxy-polyamine primer used in the **TUFFLEX®** Decking Systems and other specialty systems. It is specifically formulated to improve polyurethane elastomeric membrane adhesion to concrete, plywood, metal, polyurethane elastomeric surfaces, glass reinforced plastics, and other plastic surfaces. Because it has low odor, **TUFFLEX®** PRIMER #1 is excellent for indoor applications where fumes may be a problem.

COLORS: Side-A: Blue
Side-B: Yellow

PACKAGING: TUFFLEX® PRIMER #1 is packaged in kit form. The VOLUME MIXING ratio is 2 parts Side-A to 1 part Side-B **(Side-A:Side-B = 2:1). TUFFLEX® PRIMER** #1 is available in kits of three 0.95 liter (1 quart), three 3.79 liter (1 gallon), three 18.9 liter (5 gallon), and three 206 liter (55 gallon) containers.

PRE-APPLICATION PRECAUTIONS

LIMITATIONS: Once the material is mixed together. It must be used wIthin 20 to 30 minutes since **TUFFLEX®** PRIMER #1 cures and solidifies when the 2 parts interact. Opened containers must be sealed tightly and remaining material must be used within several days. Surfaces to be coated must be dry, clean, and free of all foreign matter.

PRECAUTION: TUFFLEX® PRIMER #1 is a component of the **TUFFLEX®** Decking Systems. It should primarily be used as stipulated in these **TUFFLEX®** GUIDE SPECIFICATIONS. Results occurring from use other than what is stipulated in the **TUFFLEX®** GUIDE SPECIFICATIONS is not tested or guaranteed by **TUFFLEX® INC.**

SURFACE REQUIREMENTS: Successful bonding requires structurally sound, strong, and clean substrates. The substrate must be cleaned to ensure that it is free of all oils, "laitances", greases and other contaminations, such as concrete curing compounds, that may cause poor adhesion of **TUFFLEX®** PRIMER #1. After cleaning, the surfaces should be rinsed thoroughly to remove loose particles and traces of the cleaning chemicals. Adhesives, sealing membranes, etc, should not be applied until the surface is dry.

APPLICATION

MIXING INSTRUCTIONS: This primer may be diluted with Xylene or MEK, to the extent allowed by local Air Quality Management authority. Addition of solvent extends the work life of the mixture, provides better surface penetration and is economical. However, strict fire fighting (equipment, procedures, etc.) and health precautions must be observed. **TUFFLEX®** PRIMER #1 Side-A and Side-B should be thoroughly agitated prior to mixing to ensure a homogeneous material. **TUFFLEX®** PRIMER #I must always be mixed with a two parts Side-A and one part Side-B (Side-A: Side-B = 2:1). The combined components should be thoroughly mixed using a mechanical mixer at slow speed or mixed for at least 5 minutes. if mixed by hand.

Add the amount of solvent desired to meet local VOC laws. The table below gives the amount of solvent to be added in fluid ounces per 3.8 liter (1 gal) mixture of A & B. Blend with a mechanical mixer (explosion proof) for 3 minutes. Induction time is not required.

APPLICATION: TUFFLEX® PRIMER #1 should be applied at the rate of 0.116 liters/square meters (1 gallon/350 square feet). It can be applied using an airless sprayer, brush, or phenolic core roller.

CURING: Allow **TUFFLEX®** PRIMER #1 to become nearly tacky to the touch, about 3 hours, before filling cracks, joints, or applying the coating. Note: Temperature will affect the curing time of **TUFFLEX®** PRIMER #1. Higher temperatures will significantly accelerate the cure time while colder temperatures will retard the cure time. To improve cure/bond time in cooler temperatures, **TUFFLEX®** PRIMER #1 should be pre-mixed and allowed to sIt in the container for 1/2 hour or longer [cooler the temperature, the longer the residence time] before application. In hot temperatures, the pot life of **TUFFLEX®** PRIMER #1 is reduced therefore the residence time should be relatively short. Recommended application temperature is >10^{0}C (50^{0}F).

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations, immediately after use. **TUFFLEX®** PRIMER #I is difficult to clean up after it has cured.

fl. oz. Xylene/ to 1 gal mixed PRIMER #1	fl. oz. MEK/ to 1 gal mixed PRIMER #1	VOC g/l
209	260	540
120	138	420
87	96	350
50	57	250
21	23	125
0	0	0

TECHNICAL DATA

Physical Property		Test Method	Results [Metric]	Results [English]
Coverage Rate			1.116 l/m^2	1 gal/350 ft^2
Dry Film thickness per Coat			102 ± 25 microns	4 ± 1 mills
Hardness		ASTM D-2240	70 + 5 Shore D	70 + 5 Shore D
Shelf Life			6 months	6 months
Specific Gravity	Side-A		1.09	1.09
	Side-B		1.07	1.07
Total Solids by Weight		ASTM D-2369	100%	100% } when free of
Total Solids by Volume		ASTM D-2697	100%	100% } Xylene / MEK
Viscosity at 24^{o}C (75^{o}F)				
	Side-A		600 ± 50 cp	600 ± 50 centipoises
	Side-B		600 ± 50 cp	600 ± 50 centipoises
Volatile Organic Compounds		ASTM D-2369-81	0.0 g/l	When free of Xylene/MEK

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts). Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. **This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).**

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX PRIMER #2

PRODUCT DESCRIPTION

COMPOSITION: TUFFLEX® PRIMER #2 is a 2 component, liquid applied, epoxy amine primer coating used to prime concrete, plywood, metal and polyurethane elastomeric surfaces before the application of a coating.

BASIC USES: TUFFLEX® PRIMER #2 is an epoxy primer used in the TUFFLEX® Decking Systems. It is specifically formulated to improve polyurethane elastomeric membrane adhesion to concrete, plywood, metal. polyurethane elastomeric surfaces, glass reinforced plastics, and other plastic surfaces. TUFFLEX® PRIMER #2 is also an excellent coating for dust proofing concrete floors in warehouses where good chemical resistance is needed. TUFFLEX® PRIMER #2 also has excellent adhesion to clean metal.

COLORS: A-Side Blue
B-Side Yellow

PACKAGING: TUFFLEX® PRIMER #2 is packaged in kit form. The VOLUME MIXING ratio is 1 part Side-A to 1 part Side-B **(Side A:Side-B = 1:1)**. TUFFLEX® PRIMER #2 is available in kits of two 3.8 liter (1 gallon) , two 18.9 liter (5 gallon), and two 208 liter (55 gallon) containers.

WARNING: The B-Side of this product Is considered Dangerous Goods. It is classified as: **RESIN SOLUTION. Class 3. UN 1866. PG II. FLAMMABLE LIQUID.**

PRE-APPLICATION PRECAUTION

LIMITATIONS: Once the material is mixed together. It must be used withIn 2 or 3 hours since TUFFLEX® PRIMER #2 cures and solidifies when the two parts interact. Opened unmixed containers must also be used within several days since TUFFLEX® PRIMER #2 contains solvents which evaporate when exposed to air. TUFFLEX® PRIMER #2 may not be diluted. Surfaces to be coated with TUFFLEX® PRIMER #2 must be dry, clean, and free of all foreign matter.

WARNING: The B-Side of this product is considered Dangerous Goods. It is classified as. **RESIN SOLUTION. Class 3. UN 1866, PG II. FLAMMABLE LIQUID.**

PRECAUTION: TUFFLEX® PRIMER #2 is a component of the TUFFLEX® Decking Systems. these TUFFLEX® Guide Specifications and results occurring from use other than what is stipulated in the TUFFLEX® GUIDE SPECIFICATIONS is not tested or guaranteed by TUFFLEX® INC.

Ensure that the decking system is properly prepared prior to application.

SURFACE REQUIREMENTS: Successful bonding requires structurally sound, strong, and clean substrates. The substrate must be cleaned to ensure that it is free of all oils, “laitances”, greases and other contaminations, such as concrete curing compounds,that may cause poor adhesion of TUFFLEX® PRIMER #2. After cleaning, the surfaces should be rinsed thoroughly to remove loose particles and traces of the cleaning chemicals. Adhesives, sealing membranes, etc. should not be applied until the surface is dry.

APPLICATION

MIXING INSTRUCTIONS: TUFFLEX® PRIMER #2 Side-A and Side-B should be thoroughly agitated prior to mixing to ensure a homogeneous material. TUFFLEX® PRIMER #2 must always be mixed using equal amounts of Side-A and Side-B. The combined components should be thoroughly mixer using a mechanical mixer at slow speed or mixed for at least 5 minutes, if mixed by hand.

APPLICATION: Before application. TUFFLEX® PRIMER #2 must be mixed according to the mixing instructions stated above. TUFFLEX® PRIMER #2 should be applied at the rate of 0.14 liters/square meter (1 gallon/300 square feet). It can be applied using an airless sprayer, brush, or phenolic core roller.

CURING: Allow TUFFLEX® PRIMER #2 to become tacky to the touch, about 3 hours, before filling cracks, joints, or applying the coating. Note: Temperature will affect the curing time of TUFFLEX® PRIMER #2. Higher temperatures will significantly accelerate the cure time, while colder temperatures will extend the cure time. To improve cure/bond time in cooler temperatures, TUFFLEX® PRIMER #2 should be premixed and allowed to sit in the container for 1/2 hour or longer before application. In hot temperatures, the pot life of TUFFLEX® PRIMER #2 is reduced therefore the residence time should be relatively short.

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations immediately after use. TUFFLEX® PRIMER #2 is difficult to clean up after it has cured.

TECHNICAL DATA

Physical Property	Test Method	Results (Metric)	Results (English)
Coverage Rate		0.31-0.51 l/m^2	1 gal/300 ft^2
Dry Film Thickness Per Coat		58 ± 2.5 microns	2.3 ± 1 mils
Hardness	ASTM D-2240	90 ± 5 Shore A	90 ± 5 Shore A
Shelf Life		6 Months	6 months
Specific Gravity Side A		1.056	1.056
Side B		0.924	0.924
Total Solids by Weight	ASTM D-2369	62.0%	62.0%
Total Solids by Volume	ASTM D-2697	53.4%	53.4%
Viscosity at 24˚C (75˚F)			
Side A		150 ± 50 cps	150 ± 50 cps
Side B		200 ± 50 cps	200 ± 50 cps
Volatile Organic Compounds	ASTM D-2369-81	348 g/l	2.9 lbs./gallon

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts)Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure sup plied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

COLORCOAT AR

PRODUCT DESCRIPTION

COMPOSITION: **TUFFLEX® COLORCOAT AR** is a 2 component, liquid applied, moisture-cured. aromatic, polyurethane waterproofing membrane.

BASIC USES: **TUFFLEX® COLORCOAT AR** is the low cost wear surface and waterproofing top-coat used in the **TUFFLEX®** Decking Systems. When **TUFFLEX® COLORCOAT AR** is incorporated into these systems. it helps to waterproof concrete and plywood decks, parking structures. helicopter pods and areas that require a seamless membrane for protection against water damage. It can also be used in industrial locations where surfaces must withstand vehicular and foot traffic. **TUFFLEX® COLORCOAT AR** can also be used on metal. rubber, wood, and masonry surfaces that require ultraviolet protection. It helps protect the surface from some types of chemical spills and will eliminate concrete dusting problems.

CAUTION: DO NOT USE the **TUFFLEX® COLORCOAT AR** in long term, standing water areas such as, waterpark lagoons, garden ponds, etc. Use the regular COLORCOAT AL in these areas.

COLORS: Tan, Med. Tan, Dk. Tan, U. Grey and Dk Grey. Custom colors are also available: Minimum order of 1,136 liters (300 Gallons).

PACKAGING: **TUFFLEX® COLORCOAT AR** is available in lots and is packaged as follows:

a) 19 liter (5 gallon) kit consists of one 19 liter (5 gallon) container of **TUFFLEX® COLORCOAT AR** and a 0.24 liters (1/2 pint) container of **TUFFLEX® COLORCOAT AR** accelerator.
b) 208 liter (56 gallon) kit consists of one 208 liter (55 gallon) container of **TUFFLEX® COLORCOAT AR** and one 0.96 liter (1 quart) container of **TUFFLEX® COLORCOAT AR** accelerator.

PRE-APPLICATION PRECAUTION

LIMITATIONS: **TUFFLEX® COLORCOAT AR** is an aromatic topcoat, the surface may become flat slightly chalky, and will have some color change over time. Containers that have been opened must be used within 1 or 2 weeks. since **TUFFLEX® COLORCOAT AR** is a moisture reactive material which sets up when exposed to air. **TUFFLEX® COLORCOAT AR** may not be diluted under any circumstance. ft is recommended to apply the **TUFFLEX® COLORCOAT AR** on a textured surface to provide slip resistance. Non textured surfaces may be slippery under wet conditions.

PRECAUTION: **TUFFLEX®** COLORCOAT AR is a component of the **TUFFLEX®** Decking Systems. It should primarily be used as stipulated in these **TUFFLEX®** GUIDE SPECIFICATIONS. Results occurring from use other than what is stipulated in the **TUFFLEX®** GUIDE SPECIFICATIONS are not tested or guaranteed by **TUFFLEX®, INC.**

Refer to the SPECIFICATION SHEETS for complete information associated with material application.SYSTEM INFORMATION is found in this catalog or may be requested separately.

APPLICATION

GENERAL: **TUFFLEX® COLORCOAT AR** requlres a few precautions to be followed during and after application. Each application should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later.

MIXING INSTRUCTIONS: Mix **TUFFLEX® COLORCOAT AR** thoroughly before combining with the accompanying **TUFFLEX® COLORCOAT AR** accelerator. Add the accelerator slowly after pre-mixing and continue to mix accelerated **TUFFLEX® COLORCOAT AR** for 2 to 3 minutes. Material should be mixed thoroughly with a mechanical mixer (Jiffy Mixer), at low RPM, not allowing entrapment of air into the mixture. Allow mixture to stand for 5 minutes, then mix again before applying to the prepared surface.

APPLICATION: **TUFFLEX® COLORCOAT AR** must be mixed according to the mixing instructions stated above before application. The first coat of **TUFFLEX® COLORCOAT AR** should be applied at the rate of 1 gallon / 80 to 100 square feet, depending upon the surface texture. For best results use a squeegee, airless sprayer or phenolic core roller. Care should be taken not to whip air into the product, this will cause pin holes. Spread **TUFFLEX® COLORCOAT AR** evenly over the entire deck resulting in 290+0.50 microns (11.5+2 dry mils) Allow to cure over night before applying the second coat. Most applications require two coats. A third coat may be necessary depending on the job specifications and requirements. When estimating material requirements. coverage rates tend to increase for subsequent coats of material. Allow each coat to cure over night between coats. To obtain proper adhesion between coats it is imperative that re-coating be done within 48 hours of any coat. After the 48 hour window has passed, *ALWAYS* apply a thinned coat of the #3 Primer prior to any second colorcoat or any recoat for warranty.

CURING: Allow **TUFFLEX® COLORCOAT AR** to cure at least 24 hours before permitting pedestrian traffic and at least 72 hours before permitting heavy traffic or placing heavy objects on the completed system. Note: Curing time depends on humidity and temperature. Low temperature and low humidity extends the curing time.
Use COLORCOAT ACCELERATOR (HARDENER) to shorten cure time. Refer to Technical Bulletins for its use.

EQUIPMENT CLEANUP: Equipment should be cleaned immediately with an environmentally-safe solvent, as permitted under local regulations.

TECHNICAL DATA

Physical Property	Test Method	Results (Metric)	Results (English)
Coverage Rate		0.31-0.51 l/m^2	3/4-11/4 gal/100 ft^2
Dry Film Thickness Per Coat		290 $\pm$ 51 microns	8-14 $\pm$ 2 mils
Hardness	ASTM D-2240	90 $\pm$ 5 Shore A	90 $\pm$ 5 Shore A
Shelf Life		6 Months	6 months
Specific Gravity		1.17	1.17
Tear Resistance Die C	ASTM D-624	51.00kNm	370 pli
Tensile Strength	ASTM D-412	18.97 MPa	3150 psi
Total Solids by Weight	ASTM D-2369	80.1%	80.1%
Total Solids by Volume	ASTM D-2697	71.8%	71.8%
Ultimate Elongation	ASTM D-412	520%	520%

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts)Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

COLORCOAT AR-SF (SOLVENT FREE)

PRODUCT DESCRIPTION

COMPOSITION: TUFFLEX® COLORCOAT AR-SF is a 2 component, 100% solids, non effluent, environmentally safe, low toxicity, liquid applied, moisture-cured, polyurethane surface protection coating.

BASIC USES: TUFFLEX® COLORCOAT AR-SF is a wear surface and waterproofing top-coat that can be used either **indoors** or **outdoors** in the **TUFFLEX®** SF Decking Systems. When **TUFFLEX® COLORCOAT AR-SF** is incorporated into these systems. it helps to waterproof concrete and plywood decks, parking structures. helicopter pads and areas that require a "SOLVENT FREE", seamless membrane for protection against water damage. It can also be used in industrial locations where surfaces must withstand vehicular and foot traffic. **TUFFLEX® COLORCOAT AR-SR** can also be used on metal. rubber, wood, and masonry surfaces that require ultraviolet protection. **TUFFLEX® COLORCOAT AR-SF** will also eliminate concrete dusting problems and will protect surfaces from some types of chemical spills. CAUTION: DO NOT USE the **TUFFLEX®COLORCOAT AR-SF** in long term, standing water areas such as, waterpark lagoons, garden ponds, etc. Use the regular COLORCOAT AL in these areas.

COLORS: Light Grey and Tan. Custom colors are available: minimum order of 1,136 liters (300 gallons). See color sample ring.

PACKAGING: TUFFLEX® COLORCOAT AR-SF is available in kits and is packaged as follows:

a) 19 liter (5 gallon) kit consists of one 19 liter (5 gallon) container of **TUFFLEX® COLORCOAT AR-SF** and a 0.24 liters (1/2 pint) container of **TUFFLEX® COLORCOAT AR-SF** accelerator.
b) 208 liter (55 gallon) kit consists of one 208 liter (55 gallon) container of **TUFFLEX® COLORCOAT AR-SF** and one 0.95 liter (1 quart) container of **TUFFLEX® COLORCOAT AR-SF** catalyst.

PRE-APPLICATION PRECAUTION

LIMITATIONS: TUFFLEX® COLORCOAT AR-SF is an aromatic topcoat. Exposing it to ultraviolet light will cause it to discolor, fade and become slightly chalky over time. Containers that have been opened must be used within 1 or 2 weeks. since **TUFFLEX® COLORCOAT AR-SF** is a moisture reactive material which sets up when exposed to air. **TUFFLEX® COLORCOAT AR-SF** may not be diluted under any circumstance. It is recommended to apply the **TUFFLEX®COLORCOAT AR-SF** on a textured surface to provide slip resistance. Non textured surfaces may be slippery under wet conditions.

PRECAUTION: TUFFLEX® COLORCOAT AR-SF is a component of the **TUFFLEX®** SF Decking Systems. It should primarily be used as stipulated in these **TUFFLEX®** SF GUIDE SPECIFICATIONS. Results occurring from use other than what is stipulated in the **TUFFLEX®** SF GUIDE SPECIFICATIONS are not tested or guaranteed by **TUFFLEX®, INC.**

APPLICATION

GENERAL: TUFFLEX® COLORCOAT AR-SF requires a few precautions to be followed during and after application. Each application should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later.

MIXING INSTRUCTIONS: Mix **TUFFLEX® COLORCOAT AR-SF** thoroughly before combining with **TUFFLEX® COLORCOAT AR-SF** accelerator. Add the accelerator slowly after pre-mixing and continue to mix accelerated **TUFFLEX® COLORCOAT AR-SF** for 2 to 3 minutes. Material should be mixed thoroughly with a mechanical mixer (Jiffy Mixer), at low RPM, not allowing entrapment of air into the mixture. Allow mixture to stand for 5 minutes, then mix again before applying to the prepared surface.

APPLICATION: TUFFLEX® COLORCOAT AR-SF must be mixed according to the mixing instructions stated above before application. The first coat of **TUFFLEX®COLORCOAT AR -SF** should be applied at the rate of 1 gallon / 80 to 100 square feet, depending upon the surface texture. For best results use a squeegee, airless sprayer or phenolic core roller. Care should be taken not to whip air into the product, this will cause pin holes. Spread **TUFFLEX® COLORCOAT AR-SF** evenly over the entire deck resulting in 363±50 mIcrons (13±2 dry mils) Allow to cure over night before applying the second coat. Most applications require two coats. A third coat may be necessary depending on the job requirements and requirements. When estimating material requirements, coverage rates tend to increase for subsequent coats. To obtain proper adhesion between coats it is imperative that recoating be done within 48 hours. After the 48 hour window has passed, *ALWAYS* apply a thinned coat of the #3 Primer prior to any second colorcoat or any recoat or any recoat for warranty.

CURING: Allow **TUFFLEX® COLORCOAT AR-SF** to cure 24 hours before permitting pedestrian traffic and at least 72 hours before permitting heavy traffic or placing heavy objects on the completed system.
Note: Curing time depends on humidity and temperature. Low temperature and low humidity extends the curing time. Use COLORCOAT ACCELERATOR (HARDENER) to shorten cure time, refer to Technical Bulletins for its use.

EQUIPMENT CLEANUP: Equipment should be cleaned immediately with an environmentally-safe solvent, as permitted under local regulations.

TECHNICAL DATA

Physical Property	Test Method	Results (Metric)	Results (English)
Coverage Rate		0.31-0.41 l/m^2	3/4-1 gal/100 ft^2
Dry Film Thickness Per Coat		254-355 ± 50 microns	10-14 ± 2 mils
Hardness	ASTM D-2240	80 ± 5 Shore A	80 ± 5 Shore A
Shelf Life		6 Months	6 months
Specific Gravity		1.2	1.2
Tear Resistance Die C	ASTM D-624	56.09 kNm	370 pli
Tensile Strength	ASTM D-412	14.00 MPa	4200 psi
Total Solids by Weight	ASTM D-2369	92.2%	92.2%
Total Solids by Volume	ASTM D-2697	89.5%	89.5%
Ultimate Elongation	ASTM D-412	590%	590%
Viscosity at 24˚C (75˚F)		5000 ± 1500 cps	5000 ± 1500 cps
Volatile Organic Compounds	ASTM D-2369-81	117 gm/liter	0.97 lbs./gallon

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts)Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

COLORCOAT AL

PRODUCT DESCRIPTION

COMPOSITION: **TUFFLEX® COLORCOAT AL** is an aliphatic, single component, liquid applied, moisture-cured, economical, polyurethane surface protection coating. **TUFFLEX® COLORCOAT AL** is UV stable and will retain its glossy appearance for a longer period of time.

BASIC USES: **TUFFLEX® COLORCOAT AL** is a wear surface and waterproofing topcoat used in the **TUFFLEX®** Systems. When **TUFFLEX® COLORCOAT AL** is incorporated into these systems, it helps to waterproof concrete and plywood decks, parking structures, helicopter pads and areas that require a seamless membrane for protection against water damage. It can be used in industrial locations where surfaces must withstand light vehicular and foot traffic. **TUFFLEX® COLORCOAT AL** can also be used on metal, rubber, wood, and masonry surfaces that require ultraviolet protection. **TUFFLEX® COLORCOAT AL** will also eliminate concrete dusting problems and will protect surfaces from some types of chemical spills.The **TUFFLEX® COLORCOAT AL** should be used in long term standing water areas, such as, waterpark lagoons, garden ponds, etc., any area that may need a coating for surface protection and/or UV blocking.

COLORS: Dark Grey, Medium Grey Dark Tan, Light Grey. Light Tan, White and Clear. Custom colors are also available; minimum order of 379 liters (100 gallons). See color chart for special provisions.

PACKAGING: Available in 3.78 liter (1 gallon), 19 liter (5 gallon) and 208 liter (55 gallon) containers.

PRE-APPLICATION PRECAUTION

LIMITATIONS: Containers that have been opened should be used within 1 or 2 days since **TUFFLEX® COLORCOAT AL** is a moisture reactive material which sets up when exposed to air. **TUFFLEX® COLORCOAT AL** may not be diluted under any circumstance. It is recommended to apply the **TUFFLEX® COLORCOAT AL** on a textured surface to provide slip resistance. Non textured surfaces may be slippery under wet conditions.

PRECAUTION: **TUFFLEX® COLORCOAT AL** is a component of the **TUFFLEX®** Decking Systems. It should primarily be used as stipulated in these **TUFFLEX®** Guide Specifications. Results occurring from use, other than what is stipulated in the **TUFFLEX®** GUIDE SPECIFICATIONS, is not tested or guaranteed by **TUFFLEX®**, **INC**.

Ensure that the surface is properly prepared prior to application. Refer to the **TUFFLEX®** Systems data sheets for complete information associated with material applications.

APPLICATION

GENERAL: **TUFFLEX® COLORCOAT AL** requires a few precautions to be followed during and after application. Each application should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later. Any remaining material must be tightly sealed to protect it against curing in its container.

MIXING INSTRUCTIONS: Before application mix **TUFFLEX® COLORCOAT AL** using a mechanical mixer (Jiffy Mixer) at slow speeds or mix for at least 5 minutes, if mixed by hand. Mix **TUFFLEX® COLORCOAT AL** thoroughly until a homogeneous mixture and color is obtained.

APPLICATION: The first coat of **TUFFLEX® COLORCOAT AL** should be applied at the rate of 0.41 liters per square meter (1 gallon per 100 square feet), depending on the surface texture. For best results use a squeegee, airless sprayer or phenolic core roller. Care should be taken not to whip air into the product, this will cause pin holes. Spread **TUFFLEX® COLORCOAT AL** evenly over the entire deck resulting in 291±50 microns (11±2 dry mils). After 24 hours, proceed to the second coat. Most applications require two coats. A third coat may be necessary depending on the job specifications and requirements. When estimating material requirements, coverage rates tend to increase for subsequent coats of material. To obtain proper adhesion between coats it is imperative that re-coating be done within 48 hours. After the 48 hour window has passed, ALWAYS apply a thinned coat of the #3 Primer prior to any second colorcoat or any recoat for warranty.

CURING: Allow each coat to cure a minimum of 24 hours. Allow **TUFFLEX® COLORCOAT AL** to cure at least 24 hours before permitting pedestrian traffic and at least 72 hours before permitting heavy traffic on the completed system.

Note: Curing time depends on humidity and temperature. Low temperature and low humidity extend the curing time. Use COLORCOAT ACCELERATOR to shorten cure time, refer to Technical Bulletin for its use.

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations, immediately after use.

TECHNICAL DATA

Physical Property	Test Method	Results (Metric)	Results (English)
Coverage Rate		0.41 l/m^2	1 gal/100 ft^2
Dry Film Thickness Per Coat		291 ± 50 microns	11.5 ± 2 mils
Hardness	ASTM D-2240	90 ± 5 Shore A	90 ± 5 Shore A
Shelf Life		6 Months	6 months
Specific Gravity		1.14	1.14
Tear Resistance Die C	ASTM D-624	18.41 kNm	140 pli
Tensile Strength	ASTM D-412	24.59 MPa	5000 psi
Total Solids by Weight	ASTM D-2369	78.0%	75.81%
Total Solids by Volume	ASTM D-2697	71.7%	68.6%
Ultimate Elongation	ASTM D-412	470%	470%
Viscosity at 24˚C (75˚F)		1500 ± 500 cps	1500 ± 500 centipoises
Volatile Organic Compounds	ASTM D-2369-81	273 g/l	2.27 lbs./gallon

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts)Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

COLORCOAT AL-ESTER

PRODUCT DESCRIPTION

COMPOSITION: TUFFLEX® COLORCOAT AL-ESTER is a single component, liquid applied, moisture-cured, polyester-polyurethane surface protection coating.

BASIC USES: TUFFLEX® COLORCOAT AL-ESTER is a wear surface and waterproofing topcoat used in the **TUFFLEX®** Systems. When COLORCOAT AL-ESTER is incorporated into these systems, it helps to waterproof concrete and plywood decks, parking structures, helicopter pads and areas that require a seamless membrane for protection against water damage. It can be used on substrates in industrial locations, heavy vehicular and pedestrian traffic areas, and other substrates such as metal, rubber, wood and masonry. **TUFFLEX® COLORCOAT AL-ESTER** can also be used as a topcoat for polyurethane athletic tracks. It is also recommended on surfaces that need protection from oils, greases, some types of chemical spillages, and ultraviolet light.

CAUTION: DO NOT USE the **TUFFLEX® COLORCOAT AL-ESTER** in long term standing water areas, such as, waterpark lagoons, garden ponds, etc. Use the regular COLORCOAT AL in these areas.

COLORS: TUFFLEX® COLORCOAT AL-ESTER is not stocked, in all colors, at all times **TUFFLEX®** standard colors and custom colors are available: minimum order of 379 liters (l00 gallons). See color chart for special provisions.

PACKAGING: Available in 19 liter (5 gallon) and 208 liter (55 gallon) containers.

PRE-APPLICATION PRECAUTION

LIMITATIONS: Containers that have been opened must be used within 1 or 2 days since **TUFFLEX® COLORCOAT AL-ESTER** is a moisture reactive material which sets up when exposed to air. **TUFFLEX® COLORCOAT AL-ESTER** may not be diluted under any circumstance. It is recommended to apply the **TUFFLEX® COLORCOAT AL-ESTER** on a textured surface to provide slip-resistance. Non textured surfaces may be slippery under wet conditions.

PRECAUTION: TUFFLEX® COLORCOAT AL-ESTER is a component of the **TUFFLEX®** Systems. It should primarily be used as stipulated in these **TUFFLEX®** GUIDE SPECIFICATIONS. Results occurring from use other than what is stipulated in the **TUFFLEX®** GUIDE SPECIFICATIONS, are not tested or guaranteed by **TUFFLEX®. INC.**

Ensure that the surface is properly prepared prior to application.

APPLICATION

GENERAL: TUFFLEX® COLORCOAT AL ESTER requires a few precautions to be followed during and after application. Each application should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later.

MIXING: Before application mix **TUFFLEX® COLORCOAT AL-ESTER** using a mechanical mixer (Jiffy Mixer) at slow speeds or mix for at least 5 minutes, if mixed by hand. Mix **TUFFLEX® COLORCOAT AL-ESTER** thoroughly until a homogeneous mixture and color is obtained.

APPLICATION: The first coat of **TUFFLEX® COLORCOAT AL-ESTER** should be applied at the rate of 1 gallon/90 t 100 square feet, depending upon surface texture. For best results use a squeegee, airless sprayer or phenolic core roller. Care should be taken not to whip air into the product, this will cause pin holes. Spread **TUFFLEX® COLORCOAT AL-ESTER** evenly over the entire deck resulting in 330±50 microns (13+ 2 dry mils). After 24 hours, proceed to the second coat. Most applications require two coats. A third coat may be necessary depending on the job specifications and requirements. When estimating material require ments, coverage rates tend to increase for subsequent coats of material. Allow each coat to cure a minimum of 24 hours. To obtain proper adhesion between coats it is imperative that recoating be done within 48 hours. After the 48 hour window has passed, *ALWAYS* apply a thinned coat of the #3 Primer prior to any second colorcoat or any recoat for warranty.

CURING: Allow **TUFFLEX® COLORCOAT AL-ESTER** to cure at least 24 hours before permitting pedestrian traffic and at least 72 hours before permitting heavy traffic on the completed system. Note: Curing time depends on humidity and temperature. Low temperature and low humidity extend the curing time. Use COLORCOAT ACCELERATOR to shorten cure time, refer to Technical Bulletin for its use.

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations, immediately after use.

TECHNICAL DATA

Physical Property	Test Method	Results [Metric]	Results [English]
Coverage Rate		0.41 l/m^2	1 gal/100 ft^2
Dry Film Thickness per Coat		330 ± 50 microns	13 ± 2 mills
Hardness	ASTM D-2240	95 ± 5 Shore A	95 ± 5 Shore A
Shelf Life		6 months	6 months
Specific Gravity		.9	.9
Tear Resistance Die C	ASTM D-624	96.39 kg/cm	500 ± 50 pli
Tensile Strength	ASTM D-412	28.69 ± 2 MPa	4200 ± 400 lbs/inch^2
Total Solids by Weight	ASTM D-2369	70.9%	70.9%
Total Solids by Volume	ASTM D-2697	61.3%	61.3%
Ultimate Elongation	ASTM D-412	250% ± 25	250% ± 25
Viscosity at 24ºC (75ºF)		1200 ± 500 cp	1200 ± 500 centipoises
Volatile Organic Compounds	ASTM D-2369-81	334 gm/liter	2.79 lbs/gallon

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes respiratory tract, and maybe harmful if swallowed, When handling, avoid contact with eyes and skin (especially open cuts) Wear protective clothing, gloves, goggles. etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and wash contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respiratory with a full face piece or an air supplied hood until all vapors have been exhausted. For additional health and safety information consult the Material Safety Data Sheet. This product may contain chemicals which the State of California lists as causing; cancer, birth defects, or other reproductive harm (Proposition 65).

DISCLAIMER: All recommendations. statements, and technical data contained herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as warranty, either expressed or implied. User shall rely on ones own information and tests to determine suitability of the product or the intended use and user assumes all risk and liability resulting from his/her use of the product Sellers and manufacturers sole responsibility snail be to replace that portion of the product of this manufacturer which proves to be defective. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or Statements other than those contained in a written agreement signed by an officer of the manufacturer shall not be binding upon the manufacturer or seller.

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

COLORCOAT ACCELERATOR

PRODUCT DESCRIPTION

COMPOSITION: COLORCOAT ACCELERATOR is a single component, low viscosity, accelerating agent for COLORCOAT AL, AL-SF, AL-ESTER, FR, AR, AR-SF, and AR-FR.

BASIC USES: COLORCOAT ACCELERATOR is added to moisture-cured topcoats before their application. This accelerated mixture, helps the topcoats cure (under the influence of heat and moisture) to a perfectly homogenous and blister-free coating at a very fast rate.

COLOR: Clear/pale yellow.

PACKAGING: COLORCOAT ACCELERATOR is available in 0.95 liter (1 quart) containers.

PRE-APPLICATION PRECAUTION

LIMITATIONS: COLORCOAT ACCELERATOR must not be exposed to moisture. COLORCOAT ACCELERATOR may react with atmospheric moisture which can render it unusable and when added to COLORCOAT topcoat it can cause it to gel.

EXCESSIVE ADDITION OF COLORCOAT ACCELERATOR MAY ALSO RESULT IN A DRASTIC REDUCTION IN PHYSICAL PROPERTIES, CAUSING THE CURED TOPCOAT TO CRACK AND DEGRADE.

The accelerated mixture is also not recommended for indoor applications unless performed with adequate ventilation.

WARNING: COLORCOAT ACCELERATOR is classified as hazardous. It is classified as: **CORROSIVE LIQUID N.O.S. (CONTAINS AMINE), CLASS 8, UN 1760, PG III.**

PRECAUTION: COLORCOAT ACCELERATOR is a component of the **TUFFLEX®** Decking Systems. It should primarily be uses as stipulated in these guide specifications. Results occurring from use other than what is stipulated in these guide specifications are not tested or guaranteed by **TUFFLEX®**, INC.

APPLICATION

GENERAL: Topcoat accelerated with COLORCOAT ACCELERATOR requires a few precautions to be followed during and after application. Each application should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks to disfigure the deck. Application should not be stopped part way across an area and then completed several or more hours later. Accelerated topcoat must be used with 2 hours.

MIXING INSTRUCTIONS: It is recommended that no more than 1 liter (1 quart) of COLORCOAT ACCELERATOR be added to 19 liters (5 gallons) of COLORCOAT topcoat. COLORCOAT ACCELERATOR may be mixed into COLORCOAT topcoat by using a mechanical mixer (Jiffy Mixer) at low speed or mixed for at least 2 minutes, if mixed by hand. Material should be mixed thoroughly being careful not to allow entrapment of air into the mixture. Mix until the entire contents appears uniform. After mixing, keep the container closed when not pouring the material, because material exposed to air skins very fast.

APPLICATION: The topcoat accelerated with COLORCOAT ACCELERATOR can be applied using a phenolic core roller, brush, or airless sprayer (See COLORCOAT topcoat Technical Bulletin for specific application procedures).

CURING: Under optimum condition, material will be ready for light traffic within 8 to 12 hours and heavy traffic within 72 hours.

Note: Curing time depends on humidity and temperature. Low temperature and low humidity extends the curing time. Good ventilation, however, will reduce drying time by dissipating solvents in the topcoats. In areas with limited air circulation, forced air ventilation is strongly recommended.

EQUIPMENT CLEANUP: Equipment should be cleaned with an environmentally-safe solvent, as permitted under local regulations, immediately after use.

HEALTH PRECAUTIONS: The uncured components of this product can cause irritation to the eyes, skin, mucous membranes, respiratory tract, and may be harmful if swallowed. When handling, avoid contact with eyes and skin (especially open cuts). Wear protective clothing, gloves, goggles, etc. to minimize contact with material. In case of contact, immediately wash off with plenty of water for at least 15 minutes. For eyes, obtain medical attention promptly. Always wash hands after use and was contaminated clothing and footwear before reuse. In case of ingestion, do not induce vomiting and obtain medical attention immediately. In case of extreme exposure or adverse reaction, remove affected personnel to fresh air immediately and obtain medical help. This product may contain isocyanates and may cause allergic skin or respiratory reaction. Individuals with chronic respiratory problems or prior respiratory reactions to such materials should not be exposed to vapors. When applying any product avoid breathing harmful vapors. All personnel entering the application area must wear approved positive pressure supplied air respirator with a full face piece or an air supplied hood until all vapors have been exhausted.
For additional health and safety information consult the Material Safety Data Sheet. **This product may contain chemicals which the State of California list as as causing: cancer, birth defects, or other reproductive harm (Proposition 65).**

TECHNICAL DATA

Physical Property	Test Method	Results
Pot Life (during application)		180 ± 30 minutes
Shelf Life		1 year
Specific Gravity		0.91
Total Solids by Weight	ASTM D-2369	100%
Total Solids by Volume	ASTM D-2697	100%
Viscosity at 24˚C(75F)		100 ± 50 centipoises
Volatile Organic Compounds	ASTM D-2369-81	0.0 g/l

THIS PUBLICATION SUPERSEDES ALL OTHERS **ColorCoatAccel.PM65 Jan. 2002**

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX (883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFFLEX PRIMER #3

PRODUCT DESCRIPTION

DESCRIPTION:
TUFFLEX® Primer #3 is a two component, high solids, liquid applied urethane primer with unique penetrating characteristics.

FEATURES:
High Solids, Low Odor, Fast Re-coat Time, Low Viscosity, Excellent Adhesion.

TYPICAL USES:
Concrete, Plywood.

COLOR:
Part-A: Black, Part-B: White

PACKAGING:
2 gallon kit: One 1 gallon (3.78 liter) can of Part-A Black Liquid, containing 1 gallon and one 1 gallon (3.78 liter) can of Part-B White Liquid, containing 1 gallon.

10 gallon kit. One 5 gallon (18.9 liter) pail of Part-A Black Liquid, containing 5 gallons and one 5 gallon (3.78 liter) pail of Part-B White Liquid, containing 5 gallons.

MIXING:
The volume mixing ratio is 1 part Part-A Black Liquid to 1 part Part-B White Liquid.

TUFFLEX® Primer #3 Part-A and Part-B should be thoroughly agitated prior to mixing to ensure a homogeneous material. **TUFFLEX®** Primer #3 must always be mixed with one part Part-A and one part Part-B (Part-A: Part-B = 1:1). Add the **TUFFLEX®** Primer #3 Part-A to the **TUFFLEX®** Primer #3 Part-B and thoroughly mix using a mechanical mixer at slow speed or at least 5 minutes, if mixed by hand.

APPLICATION:
TUFFLEX® Primer #3 should be applied at the rate of 1 gallon (mixture of Part-A & Part-B) /300 sq. ft. (0.135 liters/m^2). It can be applied using an airless sprayer, brush, or phenolic resin core roller. Do not allow the material to puddle.

Allow **TUFFLEX®** Primer #3 to dry until tac free (1 to 3 hours depending on weather conditions and temperature) before applying any coating. Recommended surface temperature should be greater than 50^oF (10^oC) and at least 5^oF above the dewpoint.

TUFFLEX® Primer #3 is very sensitive to heat and moisture. Higher temperatures and/or high humidity will significantly accelerate the cure time and pot life. Use caution in batch sizes and thickness of application.
Low temperature and/or low humidity extend the cure time.

EQUIPMENT CLEANUP:
Equipment should be cleaned with an environmentally safe solvent, as permitted under local regulations, immediately after use.

STORAGE:
TUFFLEX® Primer #3 has a shelf life of one year from date of manufacture in original, factory sealed containers.

LIMITATIONS:
Not UV stable.
Surfaces must be dry, clean and free of foreign matter.

Containers that have been opened must be used as soon as possible.

TUFFLEX® Primer #3 is difficult to clean up after it has cured.

Do not dilute **TUFFLEX®** Primer #3.

Mix no more material than can be used within 20 minutes.

WARNING
This product contains Isocyanate.

TECHNICAL DATA

Coverage Rate	1 gal/300 sq. ft. 0.135 1/m^2
Pot Life, 75^oF @ 50% R.H.	20-30 min.
Dry Film Thickness per Coat	5 ± 1 mils 127 ± 25 microns
Hardness, ASTM D-2240	70 ± 5 Shore D
Specific Gravity,	
Part-A	1.09
Part-B	1.07
Total Solids, Weight, ASTM D-2369	95%
Total Solids, Volume, ASTM D-2697	96%
Viscosity, at 75^oF (24^oC),	
Part A & B combined	600 ± 50 cps
Volatile Organic Compounds,	
ASTM D-2369-81	0.465 lbs/gal 56 gm/liter

Please read all information in the general guidelines, product data sheets, guide specifications and material safety data sheets (MSDS) before applying material. Published technical data and instructions are subject to change without notice. Contact your local TUFFLEX® *Inc. representative.*

LIMITED WARRANTY: **TUFFLEX®** Inc. warrants its products to be free of manufacturing defects and that they will meet **TUFFLEX®** Inc. current published physical properties. **TUFFLEX®** Inc. warrants that its products, when properly installed by a state licensed waterproofing contractor according to **TUFFLEX®** Inc. guide specifications and product data sheets over a sound, properly prepared substrate, will not allow water migration for a period of three (3) years. Seller's and manufacturer's sole responsibility shall be to replace that portion of the product of this manufacturer which proves to be defective. There are no other warranties by **TUFFLEX®** Inc. of any nature whatsoever expressed or implied. Including any warranty of merchantability or fitness for a particular purpose in connection with this product. **TUFFLEX®** Inc. shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. **TUFFLEX®** Inc. shall not be responsible for use of this product in a manner to infringe on any patent held by others. In addition, no warranty or guarantee is being issued with respect to appearance, color, fading, chalking, staining, shrinkage, peeling, normal wear and tear or improper application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. **TUFFLEX®** Inc. reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

DISCLAIMER: All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the users responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazard listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements, whether in writing or oral, other than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and **TUFFLEX®** Inc. makes no claim that these tests or any other tests, accurately represent all environments.

TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

14722 Spring Avenue
Santa Fe Springs, CA 90670
Toll Free: (888) TUFFLEX
(883-3539)
Phone: (562) 404-0479
Fax: (562) 404-0493

TECHNICAL BULLETIN

TUFF-SHIELD

PRODUCT DESCRIPTION

COMPOSITION: TUFF-Shield is a two component, aliphatic polyester polyurethane finish coat for use in moderate to sever chemical environments in indoor or outdoor applications.

FEATURES: Color and Gloss Retention • Impact Resistant • Chemical resistance

COLORS : Grey or Clear with a High Gloss finish.

PACKAGING: 5 gallon kit (19 liter): One 5 gallon (partial fill) pail of Part-A and one 5 gallon (partial fill) pail of Part-B. clear kit contain 4.3 gallons and Pigmented kit contains 5 gallons of material.

1 gallon kit (3.78 liter): One 1 gallon (partial fill) can containing Part-A and one 1 gallon (partial fill) can containing Part-B. Clear kit contains 0.875 gallon and Pigmented kit contains 1 gallon of material.

MIXING: TUFF-Shield may not be diluted under any circumstance. Part-A and Part-B should be mixed individually before combining. Add Part-B to Part-A while mixing, using a mechanical mixer (Jiffy Mixer) at medium speeds. Mix until a homogeneous mixture and color is obtained (at least 5 minutes) and mix frequently during application to maintain uniform color. Use care to scrape the sides of the container to ensure that no unmixed material remains.

SURFACE PREPARATION: See General Guidelines for additional surface preparation information.

All surfaces must be free of oil, grease, dirt and other contaminants.

Existing Coating: A test area should be completed before topcoating.

CONCRETE: Pressure wash (2-3000 psi) with clean fresh water in conjunction with biodegradable cleanser if necessary to remove all contaminants. Surface shall be dry and free of all oils, wax or any loose sealers or coatings.

Surface temperature should be between 60-100^{o}F (15.5-37.7^{o}C). Do not apply product unless temperature is at least 5o above the dewpoint. Re-coat schedule is 8-48 hours depending on the environment.

APPLICATION: Check area of application to ensure that it conforms to the substrate requirements as stated in the general guideline section. Prime interior and exterior floors and slabs. Apply TUFF-Shield to the substrate at a rate of 250 to 300 sq. ft. per gallon. Additional coats may be necessary to achieve desired results.

BRUSH: Use solvent resistant mohair or natural bristle brush with feather edge.

ROLLER: Use solvent resistant phenolic core, short nap sheepskin or equal natural roller covers.

EQUIPMENT CLEANUP: Equipment should be cleaned with water, detergent, or environmentally safe solvent, as permitted under local regulations, immediately after use.

STORAGE: TUFF-Shield has a shelf life of six months from date of manufacture in original, factory sealed containers.

LIMITATIONS: TUFF-Shield should not be applied in areas where the surface will come into continual contact with water (Ponds, Pools, etc.)

The uncured materials used in TUFF-Shield are very sensitive to heat and moisture. Higher temperature and/or high humidity will accelerate the cure time. Use caution in batch sizes and thickness of application. Low temperature and/or low humidity extends the cure time and the use of accelerators may be necessary.

Each application phase to an area should be done in one complete step. A continuous application will ensure a smooth and level coat with no lines or streaks.

Material remaining after application must be tightly sealed to protect it against curing in its container.

WARNING: This product contains Isocyanates and Solvent.

Part-A of this product is considered Dangerous Goods. DOT regulations classify it as: **PAINT, Class 3, UN 1263, PG III, FLAMMABLE LIQUID.**

TECHNICAL DATA

Physical Property	Results [Metric]	Results [English]
Coverage Rate, per sq. ft.	0.163 l/m^2	0.4 gal
Dry Film Thickness, Per coat @ 1/2 gal. per ft.^{2}	127 ± 50 mic	5 ± 2 mils
Pot Life at 75^{o} F (24^{o} C)		2 - 3 hours
Flash Point	32.7^{o}C	91^{o}F
Total Solids by Volume, ASTM D-2697		63%
Volatile Organic Compounds, ASTM D-2369-81	337 gm/liter	2.8 lbs/gal.

CHEMICAL RESISTANCE D-4

EXCELLENT	GOOD	FAIR	POOR
Distilled Water	Unleaded	Hexanol	IPA, 99%
Skydrol	Gasoline	Acetone	Butanol
Skydrol Jet Fuel		MEK	
Hydrolic oil		MIBK	
Motor Oil		Butyl Acetate	
		Toluene	
		Xylene	

Please read all information in the general guidelines, product data sheets, guide specifications and material safety data sheets (MSDS) before applying material. Published technical data and instructions are subject to change without notice. Contact your local **TUFFLEX®** representative.

LIMITED WARRANTY: TUFFLEX® warrants its products to be free of manufacturing defects and that they will meet current published physical properties. **TUFFLEX®** warrants that its products, when properly installed by a state licensed waterproofing contractor according to **TUFFLEX®** guide specifications and product data sheets over a sound, properly prepared substrate, will not allow water migration for a period of one (1) year. Seller's and manufacturer's sole responsibility shall be to replace that portion of the product of this manufacturer which proves to be defective. There are no other warranties by **TUFFLEX®** Products of any nature whatsoever expressed or implied, including any warranty of merchantability or fitness for a particular purpose in connection with this product. **TUFFLEX®** shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. **TUFFLEX®** shall not be responsible for use of this product in a manner to infringe on any patent held by others. In additions, application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. **TUFFLEX®** reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

DISCLAIMER: All guidelines, recommendations. statements, and technical data contained herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as warranty, either expressed or implied. It is the users responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazard listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. recommendations or statements, whether in writing or oral, other that than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and **TUFFLEX®** makes no claim that these tests or any other tests, accurately represent all environments.