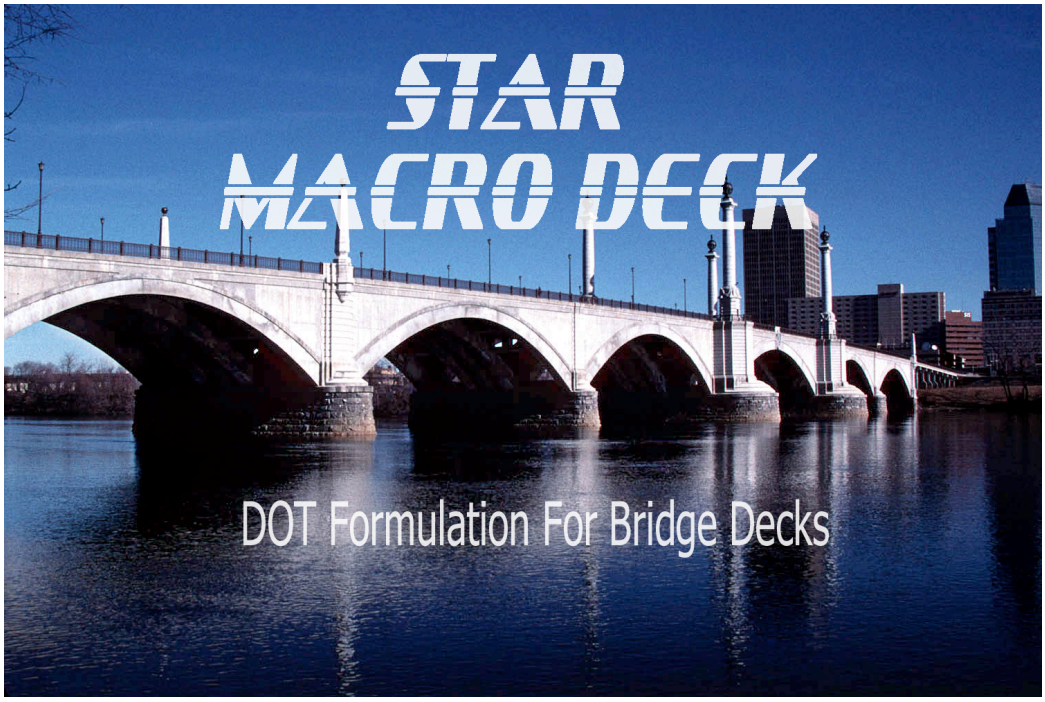
STAR MACRO-DECK

PENETRANT & SEALANT FOR CONCRETE



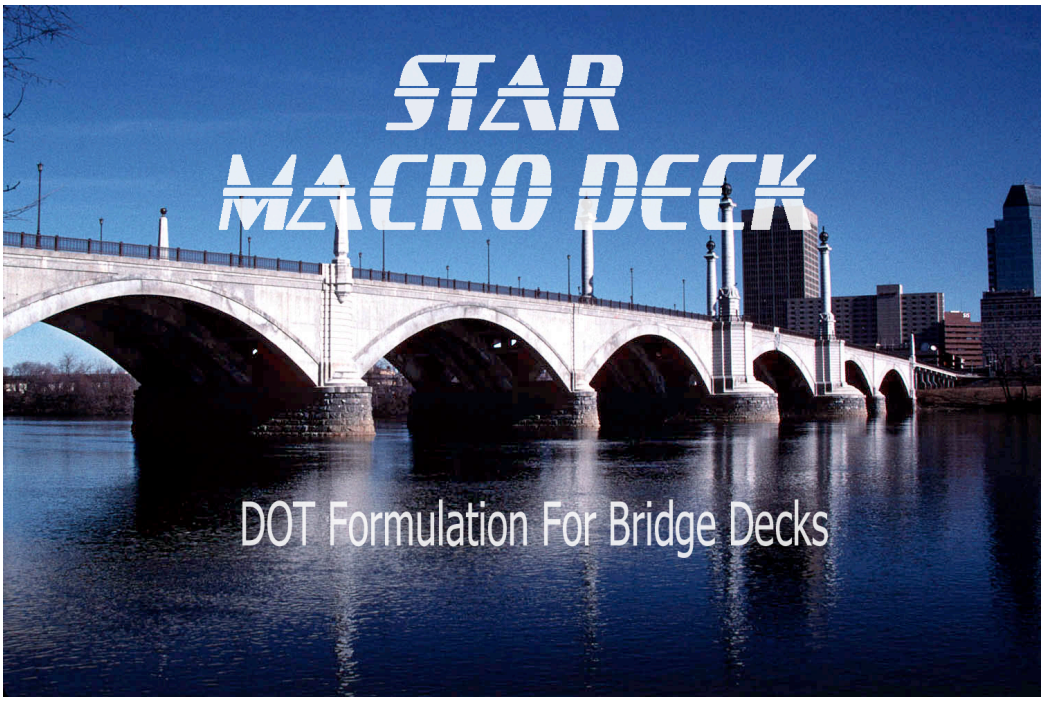
SOURCE BOOK

CUSTOMER INFORMATION SHEET
SUMMARY SHEET
PRODUCT BULLETIN
APPLICATION DETAILS, TOOLS
M.S.D.S.
M.D.O.T. TEST DATA
PHOTO ALBUM

CUSTOMER INFORMATION SHEET

STAR MACRO-DECK

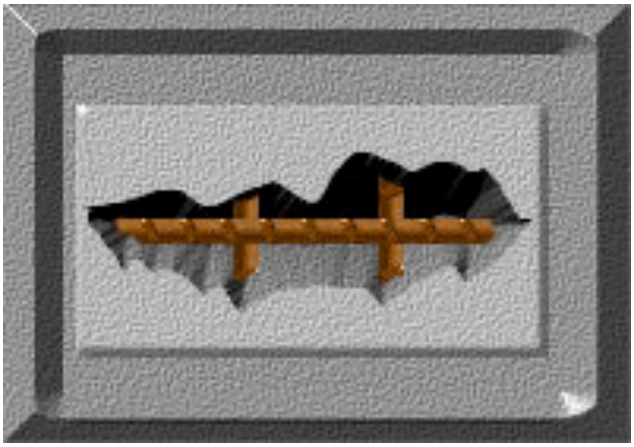
PENETRANT & SEALANT FOR CONCRETE



STAR MACRO-DECK has been approved by Iowa, Nebraska and North Carolina DOTs., for application on Concrete bridge decks, superstructures, and concrete control barriers.

What destroys concrete: The irreversible effects of weathering water, deicing salts, and other elements commonly damage

concrete. Deicing salts, used for roads, produce severe spalling, map cracking, crumbling and moderate fracturing of concrete structures. Additionally, deicing salts permeate through concrete and corrode reinforcing bars (rebars) and thus destroy the load bearing capacity of the overall concrete structure. Over time, this can lead to the complete catastrophic structural failure.



How can concrete be protected?

Concrete can be effectively protected by a specialty treatment that will stop salt penetration and reduce concrete deterioration by other damaging elements.

What is STAR MACRO-DECK?

STAR MACRO-DECK is a specialty product, which penetrates and protects concrete. It shields against any damage produced from deicing salts. It also provides a barrier against various petrochemicals and oils. STAR MACRO-DECK is water thin and is easy to apply.

How does it work?

STAR MACRO-DECK is based on specialty polymers and concrete saturants. It quickly penetrates into concrete surfaces and forms a rubber matrix network inside the physical concrete structure. This rubber matrix network stops water, deicing salts, and other damaging elements.

What are the major advantages?

- Shields and protects against the irreversible effects of salt and chemical damage to concrete.
- Improves flexural and tensile strength of the concrete.

- Easy to apply, fluid -water like consistency.
- Water based product is safe to handle and easy to store
- Non-flammable

RECOMMENDED USES All types of concrete surfaces. Specially formulated to perform on concrete bridge decks.

Properties & Specifications:

Resistant to: Deicing salts, hydraulic oils, kerosene, transmission fluid, fat, lubricating oils, grease, etc.

Polymer type: 100% Acrylic polymer

Dilution rate: STAR MACRO-DECK shall be diluted with clean potable water. The amount of water added will vary according to the porosity, age and profile

Application Methods: Spray, roller, or brush.

Coverage Rates: Recommended coverage rate is 200-300 sq. ft/gallon, which may vary depending upon dilution rate and porosity of the surface.

Drying Time: Approx. 30 minutes. Will vary according to ambient temperature and drying conditions.

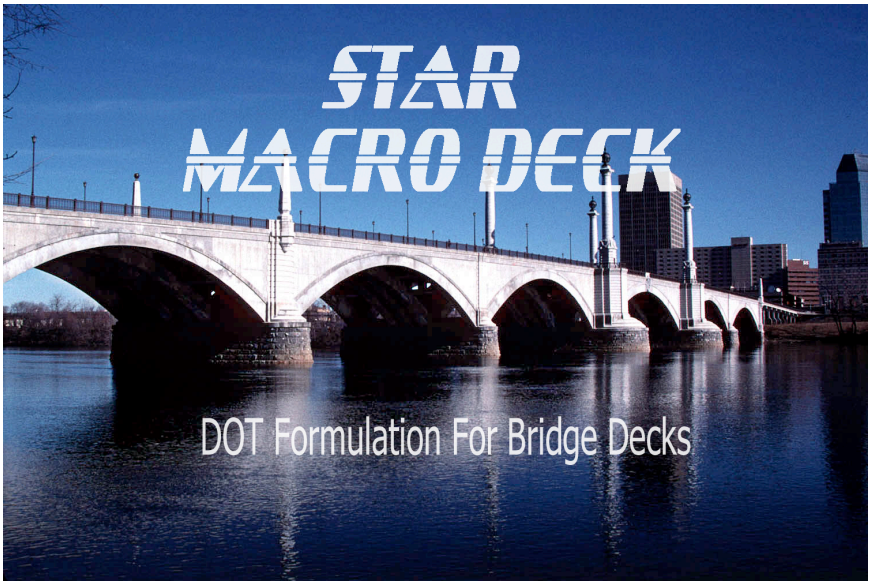
Package and availability: 5-gal pails, 55-gal. Drums, 275 gallon reusable container. This product is available at all STAR locations nationwide.

August 3, 2002

SUMMARY SHEET

STAR MACRO-DECK

PENETRANT & SEALANT FOR CONCRETE



What destroys concrete:

WATER, DE-ICING CHEMICALS, SALT, WEATHERING, ETC.

DAMAGE-

SPALLING, CRACKING CRUMBLING
REBARS-SALT/WATER CORRODES.

How can concrete be protected?

STOP WATER/SALT PERMEATION

What is STAR MACRO-DECK?

PENETRANT-SOAKS INTO CONCRETE & REDUCES WATER PERMEATION

How does it work?

STAR MACRO-DECK FORMS A POLYMER NETWORK INSIDE CONCRETE WHICH STOPS WATER AND SALT ATTACK.

What are the major advantages?

- Shields and protect against damaging elements.
- Improves flexural and tensile strength of the concrete.
- Easy to apply, fluid -water like consistency.
- Water based product is safe to handle and easy to store
- Non-flammable

RECOMMENDED USES: **ALL CONCRETE STRUCTURES**

APPROVED BY IOWA, NEBRASKA, MISSOURI
South Dakota, North Carolina D.O.Ts
and a number of cities and municipalities.

Product Bulletin

STAR MACRO-DECK

Specialty Penetrant and Sealer for Concrete Bridge Decks

GENERAL DESCRIPTION

STAR MACRO-DECK protects concrete bridge decks against salt and damage from chemicals.
STAR MACRO-DECK quickly penetrates concrete surfaces and forms a rubber network in the interstices that stops water, chloride de-icing chemicals, salt, and other damaging elements from entering the concrete surface.

OUTSTANDING FEATURES

- Inhibits chloride de-icing chemicals, salt and damage from chemicals to concrete.
- Maintains flexural and tensile strength of the concrete.
- Very easy to apply. Very fluid, water like consistency.
- Water- based, safe to handle and easy to store.
- Non-flammable.

RECOMMENDED USES

On all types of concrete surfaces,
Concrete bridge decks, support structures, guard walls.
Median dividers, curbs.
Grain elevators.
Sanitary sewer.
Masonry walls and floors.
Airport taxiways and aprons.

PROPERTIES & SPECIFICATIONS

Chemical Properties

Polymer type	100% Acrylic
Resistant to	**Rating**
Water/salt	Excellent
Chloride de-icing chemicals	Excellent
Petroleum (Hydraulic) oils	Excellent
Kerosene	Excellent
Transmission Fluid	Excellent
Fat, grease, lubricating oils	Excellent

Resistance to many hydrocarbons, and other petrochemicals.

Physical Properties

Solids, % by weight	19-21
Weight/gallon	8.5-8.6
Viscosity, cps.	60-70
Color-	Clear or light tint
Dry film	Transparent

DURABILITY

Estimated durability for;

Abutments - Over 3 years
Decks - Approx. 3 years

PENETRATION IN CONCRETE;

Surface with no cracks-	0.50 inch
Surface with minor cracks-	1.00 inch

APPLICATION NOTES

a. CONCRETE PREPARATION: Concrete must be clean, free of dust, grease, grime, mold, mildew and debris. Additionally, the surface must have a profile and a certain degree of porosity for STAR MACRO-DECK to penetrate swiftly and effectively.

Smooth surfaces (including trowel finish) – Etch with muriatic acid (see detailed application specification) ,

Oil, Grease, etc. Remove by degreasing and washing with a detergent.

Mold, Mildew- Remove with a bleach wash or any other suitable method.

b. Dilution rate: STAR MACRO-DECK shall be diluted with clean potable water. The amount of water added will vary according to the porosity, age and profile. Generally for;

Abutments:	Use as supplied, dilution is not recommended.
Decks:	New: Mix STAR MACRODECK with an equal volume of water (1:1). Older Decks: Apply either at full strength or apply pre-diluted in 1:1 ratio with water.

Always ***add water into STAR MACRO-DECK***, not vise-versa.

c. Application Methods: Spray, roller or brush.

d. Coverage Rates: Will vary according to dilution.
200-300 Square Feet/ gallon.

f. Drying Time: Approx. 30 minutes. Will vary according to ambient conditions.

Weather Limitations:

STAR MACRO-DCEK is a water-based product therefore it must be protected from freezing.
Ground and air temperature must be 50 ºF and rising prior to and after application.
Drying is retarded by high humidity and low temperatures.
Do not apply during rainy or foggy weather.
Apply at the recommended application rates. Thick applications will require more time to dry and fully cure.

PRECAUTIONS

Keep from freezing
Observe all safety precautions
Consult Material Safety Data Sheet for details

PACKAGING

5- gal. plastic pails
55 gal. Drums
275 gal. Plastic totes.

KEEP OUT OF REACH OF CHILDREN

SHIPPING POINT

STAR PLANTS

STAR
SPECIALTY TECHNOLOGY AND RESEARCH

STAR MACRO-DECK

PENETRANT & SEALANT FOR CONCRETE

APPLICATION DETAILS

OF METHODS AND TOOLS FOR VARIOUS BRIDGE STRUCTURES & OTHER SUBSTRATES.

APPLICATION OF
STAR MACRO-DECK
CONCRETE BRIDGE & SUPER STRUCTURES

General Comments

STAR MACRO-DECK should be applied in the sequence noted below. The goal is to apply STAR MACRO-DECK to the structures below the bridge deck and finish the project with application on the bridge deck. This procedure will ensure efficiency and the optimum use of material.

CONCRETE PREPARATION:

a. **New concrete installations** shall be allowed to cure according to the engineering specifications. Any curing compound (e.g. oil, petroleum based shall be allowed to sufficiently weather and dissipate prior to treatment with STAR MACRO-DECK.

   Perform a " water-break-free" test to confirm that surface oils have degraded and dissipated. Cast one gallon of clean water out over the surface. The water should sheet out and wet the surface uniformly without crawling or showing oil rings. If the concrete surface does not pass this test, additional time shall be allowed for surface oil degradation and dissipation.

b. **Concrete must be clean**, free of dust, grease, grime, mold, mildew and debris. Additionally, the surface must have a profile and a certain degree of porosity for STAR MACRO-DECK to penetrate swiftly and effectively.

   Smooth surfaces (including trowel finish) – Etch with muriatic acid according to the generally recommended practices. The etched surface shall be washed thoroughly to remove traces of muriatic acid.

   Oil, Grease, etc. Remove by degreasing and washing with a detergent.

   Mold, Mildew- Remove with a bleach wash or any other suitable method.

   The washings shall be disposed of in accordance with the applicable regulations.

STAR MACRO-DECK is suggested to be either without dilution or diluted with clean potable water. The suggested dilution rates below are to serve as a guide only and suitable for most applications. In special situations, the project engineer will be assisted by STAR Technical Team to arrive at the right dilution rate and other application details.

1. Columns:

Tools	Use a small (C) or large diaphragm (D) pump with a telescopic extension wand.
Pressure	40+ (more than) PSI
Rate of Application	4 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	300
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Cone (C), Vertical Fan (V), Horizontal (H)
Drying Time, Minutes.	30+

2. Abutments (Solid support for the extremity of a bridge)

Tools	A hand pump sprayer (B) is preferred. Also a small diaphragm pump (C) may be used.
Pressure	0-40 PSI
Rate of Application	4- (less than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200
Dilution rate (suggested)	Use as supplied
Spray tips and spray pattern	Cone (C), Vertical Fan (V),
Drying Time, Minutes.	90

3. Under Deck Weep Holes

Tools	A hand pump sprayer (B) with a curved wand is preferred.
Pressure	40- (less than) PSI
Rate of Application	2 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	Apply 2 coats. Coverage rate for each coat-200 sq. ft. Per gallon
Dilution rate (suggested)	Use as supplied
Spray tips and spray pattern	Cone (C)
Drying Time, Minutes.	30-60

4. Top of the Side Walls

Tools	For the very top of the sidewalls, use a paint roller with heavy nap. For the rest of the area, a hand pump sprayer (B) or a small

	diaphragm pump (C) may be used. Avoid over-spraying on traffic below the bridge deck. Do not get the mist on vehicles. Any overspray (mist) on the grass or ground is inconsequential.
Pressure	0-40 PSI
Rate of Application	2 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-250
Dilution rate (suggested)	Use as supplied
Drying Time, Minutes.	30

5. Vertical Walls

Tools	A small diaphragm (C) is the preferred tool. A roller (A), a hand sprayer (B) or a large Diaphragm pump may also be used
Pressure	40 PSI
Rate of Application	4 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	250
Dilution rate (suggested)	Use as supplied
Spray tips and spray pattern	Vertical (V) nozzle tip
Drying Time, Minutes.	30

6. Walkways

Tools	A hand sprayer (B) is preferred. A small Diaphragm pump (C) may also be used. A 30” squeegee brush may be used to spread the material.
Pressure	40- (less than) PSI
Rate of Application	4 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-300
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Nozzle with Cone (C) in Vertical (V) spray pattern.
Drying Time, Minutes.	45

7. Bridge Decks

Tools	A large Diaphragm pump (D) is preferred. A hand pump sprayer (B), a small Diaphragm pump (C) may also be used. A 30” squeegee brush may be used to spread the material.
Pressure	40 PSI
Rate of Application	4+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-300

Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Nozzle with 20 º Horizontal (H) spray pattern.
Drying Time, Minutes.	60+

a. Saw-cut Groove Finish

Tools	A small Diaphragm pump (C) is preferred. A hand pump sprayer (B), a large Diaphragm pump (D) may also be used. A 30” squeegee brush may be used to spread the material.
Pressure	40 PSI
Rate of Application	4+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-250
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Nozzle with Horizontal (H) spray pattern.
Drying Time, Minutes.	90+

b. Raked Concrete Finish

Tools	A large Diaphragm pump (D) is preferred. A hand pump sprayer (B), a small Diaphragm pump (C) may also be used. A 30” squeegee brush may be used to spread the material.
Pressure	40 PSI
Rate of Application	4+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	250-300
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Nozzle with Horizontal (H) spray pattern.
Drying Time, Minutes.	90+

c. Broom Concrete Finish

Tools	A large Diaphragm pump (D) is preferred. A hand pump sprayer (B), a small Diaphragm pump (C) may also be used. A 30” squeegee brush (E) may be used to spread the material. A 30” rubber squeegee (F) may also be used.
Pressure	40 PSI.
Rate of Application	4+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-300

Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Nozzle with Horizontal (H) spray pattern.
Drying Time, Minutes.	60+

APPLICATION OF
STAR MACRO-DECK
OTHER STRUCTURES & SUBSTRATES.

1. Curbs, Islands

Tools	A small diaphragm (C) is the preferred tool. A small hand sprayer may also be used. Avoid overspray on the adjacent areas
Pressure	40 PSI
Rate of Application	4 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-300
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Vertical (V) spray patterns
Drying Time, Minutes.	60

2. Concrete Deck around a Swimming Pool

Tools	A paint roller with heavy nap (A) and small diaphragm (C) pump are the preferred tools. A small hand sprayer (B), a large diaphragm pump (D),30" brush, 30" squeegee even a paint brush (G) may be used.
Pressure	40 PSI
Rate of Application	4+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200-300
Dilution rate (suggested)	Use as supplied or mix with 1:1 water.
Spray tips and spray pattern	Vertical (V) spray patterns
Drying Time, Minutes.	45

3. Concrete blocks, Brick and rough surfaces

Tools	A paint roller with heavy nap (A) is the preferred tool. A small hand sprayer (B), a small diaphragm pump (C), even a paint brush (G) may be used.
Pressure	40 PSI
Rate of Application	4- (less than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	200

Dilution rate (suggested)	Use as supplied or mix with max.1:1 water.
Spray tips and spray pattern	Cone (C), Vertical (V) spray patterns
Drying Time, Minutes.	90

WOOD SUBSTRATES

General Comments:

1. Use only on wood substrates that have weathered sufficiently to allow the penetration of STAR MACRO-DECK. Freshly treated (linseed oil, preservatives, commercial treatments, etc.) wood will not allow the penetration of the STAR MACRO-DECK into the wood substrate.

2. Wood brightners (specialty products to restore the natural color of wood) shall be used, if specified, prior to treatment with STAR MACRO-DECK.

1. Wood fences

Tools	A small hand sprayer (B) is the preferred tool. A paint roller with heavy nap (A), a small diaphragm pump (C), even a paint brush (G) may be used.
Pressure	40- (less than) PSI
Rate of Application	4 Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	Less than 200
Dilution rate (suggested)	Use as supplied or mix with max.1:1 water.
Spray tips and spray pattern	Cone (C) spray patterns
Drying Time, Minutes.	30

2. Wood decks

Tools	A paint roller with heavy nap (A) is preferred tool. A small hand sprayer (B) and even a paint brush (G) may be used.
Pressure	40- (less than) PSI
Rate of Application	2+ (more than) Gallons/ minute
Coverage Rate, Sq. ft./ Gal.	More than 200
Dilution rate (suggested)	Use as supplied or mix with max.1:1 water.
Spray tips and spray pattern	Cone (C), Vertical (V) spray pattern.
Drying Time, Minutes.	90

NOTES (for the tabulation below)

* Nozzle tip C= Cone, V= Vertical, H= Horizontal spray patterns.

** Drying time is noted for drying under average drying conditions, 70-80 º F and approx. 50-60% Relative Humidity.

*** Pending areas are the areas in the vicinity of the structure being treated. These areas are to be protected from over sprays on vehicles/traffic.

Other comments:

1. Optimize nozzle spray pattern/ increase droplet size to reduce over spray.
2. May not significantly lower water permeability on non-cracked Latex Modified or impregnated concrete structures.

STAR MACRO-DECK
APPLICATION ON VARIOUS SUBSTRATES.

	Methods of Application	
A.		Roller (Heavy Nap) / extension handle
B.		Hand Pump Sprayer / 2-5 gal
C.		Small Diaphragm pump/ with Hand Wand
D.		Large Diaphragm pump/ Distributor bar & wand
E.		30" wide squeegee brush
F.		30" wide rubber squeegee
G.		Paint brush

Color codes for application methods.

B	RED, BOLD: Preferred application tool
B	BLUE BOLD: Alternate tool for application.
I	BLUE, ITALICS: Supporting tool to be used

Example- Item 7 -Saw cut groove, the preferred application tool is C small diaphragm pump and the puddles can be spread around with E, 30" brush.

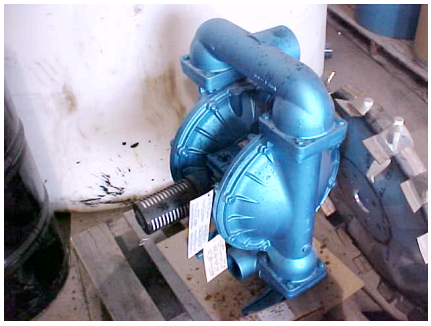
APPLICATION DETAILS BY SUBSTRTATE AND METHODS

			Pressure	Rate of Appl.	Coverage Rate	Macro-Deck	Spray pattern	Drying
	Area Uses BRIDGE DECKS (in order of sequence)	**Application**	**PSI (+/-)**	**GPM (+/-)**	**Sq.Ft./Gal. (+/-)**	**Solids (+/-)**	**Tip Type ***	**Minute**
1	Columns	C D telescope extension wand	40 +	4	300	10-20	CVH	30 +
2	Abutments	**B** C	0-40	4-	200	20	C V	90
3	Under Deck Weep holes	B Curved wand	-40	2	2 coats 200 sq. ft. Per coat.	20	C	30/60
4	Top of Side Wall	B C **A** Pending *** Area Below Bridge	0-40	2	200-250	20	Roll	30
5	Vertical Wall	A B **C** D	40	4	250	20	V	30
6	Walkways	**B** C E	-40	4	200-300	10-20	C V	45
7	Bridge Deck	B C **D** E	40	4+	200-300	10-20*	20* H	60+
	Saw Cut Groove	B **C** D ***E***	40	4-+	200-250	10-20	H	90+
	Raked Conc.	B C **D** ***E***	40	4+	250-300	10-20	H	90+
	Broom Finish OTHER APPLICATIONS	B C **D** ***E*** F	40	4+	200-300	10-20	H	60+
	Curb/Island	B **C** PENDING WIDTH & AMOUNT	40	4	200-300	10-20	V	60
	Swimming Pool Conc. Deck	**A** B **C** D ***E*** F G	40	4+	200-300	10-20	V	45
	Brick/Block Rough Surface	**A** B C G	40	4-	200	10+	C V	90
	Wood Fence	A **B** C G	-40	4	-200	10+	C	30
	Wood Deck	**A B** G	-40	2+	+200	10+	C V	90

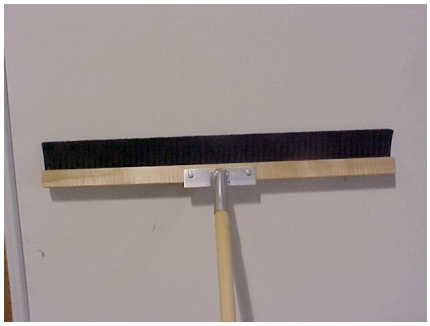
STAR MACRO-DECK APPLICATION TOOLS

BRUSH

ROLLER



DIAPHRAGM PUMP



30 “ BRUSH

30” SQUEEGEE

MATERIAL SAFETY DATA SHEET

Manufacturer: **S.T.A.R., INC**.
1150 Milepost Dr.
Columbus, Ohio 43228

Emergency Phone No. CHEM-TEL 800-255-3924
Information Phone No. 614-870-0744
Date of Preparation 09/13/02
Supersedes Date 02/15/01

SECTION I- IDENTIFICATION

Product Name: **STAR MACRO-DECK- Penetrant & Sealant for concrete surfaces.**
Chemical Family - Latex Specialty Additive.
Chemical Name - Proprietary.
Prepared by - G.C. Dubey

H.M.I.S.
Health = 1
Fire =1
Reactivity = 1

N/A = Data Not Available N/AP = Not Applicable

SECTION II- INGREDIENTS

Ingredients	CAS NO.	WT%	Exposure Limits (OSHA/ACGIH)	
			PEL	TLV
Water	7732-18-5	78-80	None	None
Polymer	Proprietary	18-20	None	None
Surfactants	Proprietary	1-2	None	none

SECTION III, PHYSICAL DATA

Boiling Point	Vapor Pressure (mm Hg)	Vapor Density (Air=1)	Appearance
212-370 °F	25	0.6	Translucent, light green colored liquid with latex odor.

Evaporation Rate (Water=1)	Specific Gravity	% Volatile by Weight	Freezing Point
1	1.03	approx.. 75%	32 °F / O° C

Miscibility w/Water	Threshold Odor	pH	VOC gm/liter	VOC lb/Gal
Infinite	N/AP	7-8	51	0.43

SECTION IV- FIRE AND EXPLOSION HAZARD DATA

Flammability Classification	Flash Point (method used)	Flammable Limits LEL	UEL
OSHA- CLASS III B DOT- NOT REGULATED	Over 200 °F	2.6	N/A

Combustion Products	Extinguishing Media
CO, CO2, Residual Monomer vapor.	Foam, Dry Chemical, CO2

Unusual Fire and Explosion Hazards: Containers may rupture due to steam pressure build up when exposed to intense heat. Product may splatter if the temperature exceeds the boiling point of water.

Special Fire Fighting Procedures: Water may be used to Cool exposed containers to prevent pressure build up and possible rupture. Wear self-contained breathing equipment and protective clothing. Water may be ineffective to control fires. If water is used, fog nozzles are preferred.

Explosive Power	Burning Rate
N/AP	N/AP

SECTION V- HEALTH HAZARD DATA

Threshold Limit Value - N/A
Routes Of Entry - Skin, eyes, inhalation, ingestion.
Effects Of Overexposure - Acute: NO Chronic: NO

ACUTE

Eyes - May cause eye irritation.
Skin - May cause irritation, material is slightly alkaline.
Inhalation - May cause nausea and headache
Ingestion - May cause nausea, cramps, vomiting, diarrhea or acute effects.

CHRONIC

No Chronic Toxicity has been established.
Medical conditions prone to aggravation by exposure: None Known.

Carcinogenic: IARC- NO NTP- NO OSHA- NO ACGIH- NO

Emergency and First Aid Procedures

Eyes- Immediately flush with plenty of water for 15 minutes, call a physician, if condition persists.
Skin- Wash thoroughly with plenty of water and soap. Remove and wash contaminated clothing. Consult a physician if irritation persists.
Inhalation- move to fresh air, Restore breathing if required. Treat symptomatically. Consult a physician.
Ingestion- Induce vomiting only if the patient is conscious. Consult a physician or Poison Control Center immediately treat symptomatically. Show Material Safety Data Sheet (M.S.D.S.) or label.

SECTION VI- REACTIVITY DATA

Stability	Conditions to Avoid	Incompatibility
Stable	Keep from freezing.	(Materials to Avoid) None reasonably foreseeable.

Hazardous Decomposition Products - May produce fumes when heated to decomposition, as in welding or fire. Fumes may contain CO, CO2, Hydrocarbons and other products of combustion.
Hazardous Polymerization - Will not occur.

SECTION VII- SPILL OR LEAK PROCEDURES

SARA Title III

# 302 - No	# 304 CERLA - No	# 313 - No.

Steps to be Taken in Case Material is Released or Spilled

Limit spread of leak or spill. Ventilate the area.
Avoid falls as the floors may become slippery when the product is spilled.
Wear approved respiratory protection. Wear suitable protective clothing, gloves and eye / face protection. Soak up with an inert absorbent material like sand or earth and pick up waste material. Put in a sealed approved container.
Keep material out of sewers, drains and bodies of water.

The product is not considered a hazardous waste under current federal RCRA requirements.

Reportable Quantity - N/A	TPQ (Lb.) - N/A
Regulations - N/A	Hazardous Waste - N/A

SECTION VIII- SAFE HANDLING AND PROTECTION INFORMATION

Ventilation: Use local exhaust ventilation to control mists or vapors generated when using this product. Ventilation must be adequate to keep exposure below regulated limits as noted in section II.
Respiratory Protection: Appropriate respiratory protection should be selected by a qualified person if exposure is expected to be excessive.
Protective Gloves: Rubber Gloves, chemically resistant.
Eye Protection: Wear safety glasses, goggles or face shield.
Other Protective Equipment: Wear suitable protective clothing. Remove and wash contaminated clothing before re-use. A source of clean water shall be available for washing eyes and skin.
Hygienic Practices: Wash hands before eating , smoking or using washrooms. Smoke only in designated areas.

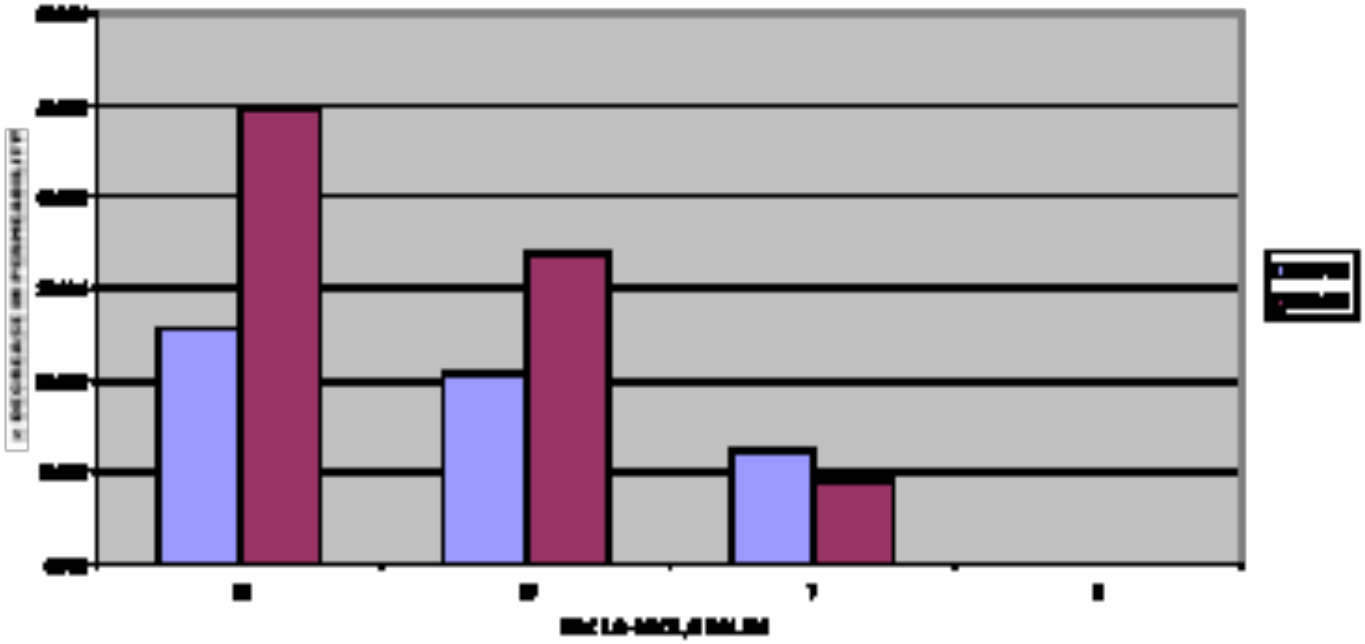
SECTION IX- SPECIAL PRECAUTIONS

1. Keep out of reach of children.
2. For professional and industrial use only.
3. Do not handle until manufacturer's safety precautions have been read and understood.
4. Use only with adequate ventilation.
5. Do not take internally.
6. Avoid contact with eyes and skin. Liquid penetrates leather and shoes causing delayed burns.
7. Wash thoroughly after using. Practice safe hygiene principles.
8. Additional Technical Data Sheets and/or M.S.D.S.'s are available upon request.
9. Store between 50-100 °F. Keep the containers tightly closed after each use.

MISSOURI D.O.T. TEST DATA.

STAR MACRO-DECK					
Lab permeability test data on a new bridge.					
Conducted by Missouri D.O.T.					
Date- 4/16/02					
Report written by- John D. Wenzlick					
	SOLIDS	**PERMEABILITY, DAYS**		**% DECREASE**	
	% WT.	**28**	**56**	**IN PERMEABILITY**	
STAR MACRO-DECK	20	2878	1816	25.86%	49.6
STAR MACRO-DECK/WATER (1/1)	10	3074	2390	20.81%	33.7
STAR MACRO-DECK (1/2)	7	3403	3280	12.34%	9.12
CONTROL-NO MACRO-DECK	0	3882	3609	0.00%	0.00

Standards of Permeability Tests				
Permeability (Sample)		**Number Range**	**General Situation Applied**	
High		>4000	High w/c ratio)=0.60	
Moderate		2000-4000	Moderate w/c ratio)=0.4-0.5	
Low		1000-2000	Low w/c ratio (Iowa dense Concrete	
Very Low		100-1000	Latex Modified concrete	
Negligible		<100	Polymer integrated polymer concret	



Permeability Data-New Bridge (MDOT)