



Municipal & Contractors Sealing Products
7740 Reinhold Drive Cincinnati, Ohio 45237

CHEMICAL GROUT SUBMITTAL

AVANTI AV-278

INCLUDES:

- TECHNICAL DATA SHEET
- SAFETY DATA SHEET
- APPLICATOR'S CERTIFICATION



AV-278 LOW VIS HYDRO™

HYDROPHOBIC POLYURETHANE FOAM

DESCRIPTION

Injected as a single component, catalyzed **AV-278** Low Vis Hydro is a moisture activated MDI-based polyurethane resin. The chemical reaction of this product is catalyzed by using **AV-279** Low Vis Accel and uses moisture as an initiator. **AV-278** was designed with soil permeation in mind – low viscosity for penetration with very high expansion to fill voids, stop active or potential water leaks, and stabilize soils. **AV-278** withstands wet/dry cycles, permeates well, and reacts with water to form a dense, closed-cell, impermeable semi-rigid foam.

APPLICATION

- Ground modification/slope stability for prevention of landslides, erosion, or any place where site conditions or project requirements dictate modification of the existing soil properties
- Fills voids on the exterior of below-grade structures
- Stops leaks in below-grade structures

FEATURES AND BENEFITS

- Low viscosity allows for excellent permeation
- Expands up to 4,000%
- Solvent-free
- Pumped as a single component
- Controllable reaction time by adjusting **AV-279** volume
- Withstands wet/dry cycles

GROUTING TECHNIQUES

- Probe Grouting
- Curtain Grouting
- Pressure Injection

HOW IT WORKS

Injected into the soil as a single component, the low viscosity resin reacts with moisture to form a dense, closed-cell, impermeable semi-rigid foam.

ADDITIVES

- **AV-279** Low Vis Accel – catalyst, 78 oz. (2.3 L)

PACKAGING

Product packaged by weight based on specific gravity.

- Drum = Net Wt. 487 lbs. / Volume 48.4 – 49.8 gal.
- Pail = Net Wt. 44 lbs. / Volume 4.4 – 4.5 gal.
- Gallon = Net Wt. 8 lbs. / Volume ~1 gal.

SHIPPING

- Motor Class 55
- Non-Hazardous
- Air freight available

CLEANING PRODUCTS

- **AV-208** Acetone, Technical Grade (CAS# 67-64-1) – removes moisture from equipment
- **AV-284** Pump Wash (Proprietary Blend) – removes uncured resin from pump and hose
- **AV-222** Cleaner (Proprietary Blend) – removes cured resin from equipment

STORAGE

Store in temperatures within or near 45°F – 95°F (7°C – 35°C) in a dry atmosphere.

PROPERTIES*

AV-278 – UNCURED

Appearance:	Brown resin
Viscosity:	25 – 100 cP @ 72°F (22°C)
Flash Point:	>200°F (>93°C)
Specific Gravity:	1.171 @ 72°F (22°C) ± 3%
Specific Weight:	72.8 lbs./ft ³ (9.74 lbs./gal) ± 3%

AV-278 – CURED

Appearance:	Milky colored rigid foam
Compressive Strength:	TBD
Toxicity:	Non-toxic

AV-279 Low Vis Hydro Accel

Appearance:	Light yellow liquid
Viscosity:	10 cP @ 72°F (22°C)
Flash Point:	>200°F (>93°C)
Specific Gravity:	0.986 @ 72°F (22°C) ± 3%
Specific Weight:	61.4 lbs./ft ³ (8.21 lbs./gal) ± 3%

*Laboratory Results

MIX PROCEDURE

Depending on the desired reaction time, up to one container of **AV-279** Low Vis Accel can be used (see chart below). Do not use more than one container of AV-279. Mix thoroughly, but slowly, to avoid creating bubbles in the solution (air bubbles will turn into moisture). Perform the standard cup test with site water to determine the desired reaction time.

PERFORMANCE

Flush equipment with **AV-208** before and after use to remove moisture and clean equipment. Performance will be influenced by site conditions. If site temperatures are low, heat the product to recommended operating temperatures of 45°F – 95°F (7°C – 35°C) and/or increase catalyst amount by 1% – 2%. Do not use open flame as a heat source. Excess amounts of **AV-279** may adversely affect performance. Because catalyzed resin will react to moisture from the air, use product soon after mixing for best results.

SAFETY

Always use OSHA-approved personal protective equipment (PPE). Refer to the SDS for complete safety precautions. The SDS is available by request or via online download at www.AvantiGrout.com.

NOTICE

The data, information and statements contained herein are believed to be reliable, but are not construed as a warranty or representation for which Avanti International assumes any legal responsibility. Since field conditions vary widely, users must undertake sufficient verification and testing to determine the suitability of any product or process mentioned in this or any other written material from Avanti for their own particular use. **NO WARRANTY OF SUITABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE.** In no case shall Avanti International be liable for consequential, special, or indirect damages resulting from the use or handling of this product.

Gel (Cure) Times for AV-278 Low Vis Hydro (Min:Sec)				
Temperature (°F)	Half Catalyst	Full Catalyst	Double Catalyst	
	40°F	2:00	1:15	0:57
	50°F	1:43	1:05	0:45
	60°F	1:20	0:48	0:34
	70°F	1:05	0:40	0:25



Section 1: Identification

GHS Product Identifier: AV-278 Low Vis Hydro
Classification: Hydrophobic Foam
Product Use: Industrial Use Only

Supplier
 Avanti International
 1100 Hercules Ave., Suite 320
 Houston, TX 77058
 Phone: 800.877.2570
 Fax: 281.486.7300

24 HR. EMERGENCY TELEPHONE NUMBER
 Chemtrec: 800.424.9300

Section 2: Hazards Identification

GHS Classification

Classification	Category	
Skin Sens.	1	Skin sensitization
Resp. Sens.	1A	Respiratory sensitization

GHS Label Elements
 Hazard pictograms:



Signal Word:	Warning
Hazards Statements:	
H317	May cause an allergic skin reaction.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Precautionary Statements:	General:
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat, hot surfaces, open flames, sparks. - No smoking.
P233	Keep container tightly closed.
P260	Do not breathe fume, mist, spray, vapors.
P264	Wash thoroughly after handling.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338	IF in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical advice and attention if you feel unwell.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P342 + P311	If experiencing respiratory symptoms: Call a poison center or doctor.
P361	Remove/Take off immediately all contaminated clothing.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use media for extinction.

P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container according to local, regional, national, and international regulations.

Other hazards not contributing to the classification:

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

Unknown Acute Toxicity (GHS-US):

No data available.

Section 3: Composition/Information on Ingredients

Weight %	Components	CAS-No./EINCS	Classification
80-85%	Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatobenzene]	(CAS #) 59675-67-1	Resp. Sens. 1, H334 Skin Sens. 1, H317
15-20%	4,4'-Methylenebis(phenyl isocyanate)	(CAS #) 101-68-8 (EINCS) 202-966-0	Acute Tox 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2A; H319 Resp. Sens. 1; H334 Skin Sense. 1; H317 Carc. 2; H351 STOT SE 3; H335 STOT RE 2; H373

Full text of H-phrases: See Section 16

Section 4: First-Aid Measures

Description of First-Aid Measures

First-aid Measures General

Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

First-aid Measures After Inhalation

Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

First-aid Measures After Skin Contact

Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.

First-aid Measures After Eye Contact

Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

First-aid Measures After Ingestion

Do NOT induce vomiting. Rinse mouth. Immediately call a Poison Center or doctor/physician.

Most Important Symptoms and Effects, Both Acute and Delayed

Symptoms/Injuries: May cause an allergic skin reaction. Inhalation may cause allergic respiratory reaction with asthma-like symptoms and difficulty breathing.

Symptoms/Injuries After Inhalation: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Symptoms/Injuries After Skin Contact: May cause an allergic skin reaction.

Symptoms/Injuries After Eye Contact: May cause eye irritation.

Symptoms/Injuries After ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: Exposure may produce an allergic reaction.

Chronic Symptoms:

Exposure may produce an allergic reaction.

Indication of Any Immediate Medical Attention and Special Treatment Needed. If exposed or concerned, get medical advice and attention.

Section 5: Fire-Fighting Measures

Suitable Extinguishing Media:	Use dry chemical, water spray or other extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media:	Do not use heavy water stream. Use of heavy stream of water may spread fire.
Special Hazards Arising from Substance or Mixture	Fire Hazard: Not considered flammable but may burn at high temperatures. Reactivity: Hazardous reactions will not occur under normal conditions. Explosion Hazard: Product is not explosive. DO NOT weld, burn or cut empty containers.
Fire-fighting Procedure	Exercise caution when fighting any chemical fire. Fire fighters should wear self-contained breathing apparatus to protect against inhalation of cyanates vapors and other decomposition/combustion products. Do not release runoff from fire control methods to sewers or waterways. Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive-pressure mode.
Other information	Refer to Section 9 for flammability properties.

Section 6: Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures

Do not get in eyes, on skin, or on clothing. Do not breathe vapor or mist.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

Methods and Material for Containment and Cleaning-Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

For Cleaning Up: Clear up spills immediately and dispose of waste safely. Spills should be contained with mechanical barriers. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

Reference to Other Sections

See Heading 8. Exposure controls and personal protection

Section 7: Handling and Storage

Precautions for Safe Handling

Keep away from sources of ignition - No smoking. Keep away from heat & open flame. Avoid all eye & skin contact & do not breathe vapor or mist. Always wash hands after handling. Do not eat, drink or smoke when using this product. Ensure there is adequate ventilation. Wear recommended personal protective equipment. Take precautionary measures against static discharge. Use grounded electrical/mechanical equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

Conditions for Safe Storage (Including Any Incompatibilities)

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use.

Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Products: Isocyanates react slowly with water, alcohols, amines, acids and bases.

Section 8: Exposure Controls/Personal Protection

Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

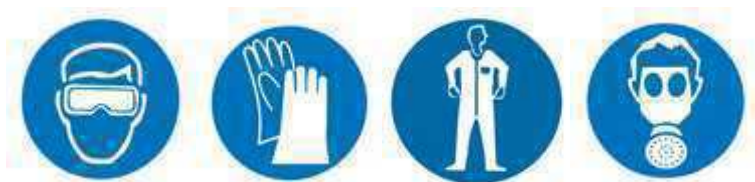
4,4'-methylenediphenyl diisocyanate (4,4' MDI) (101-68-8)

ACGIH	TLV (ppm)	0.0050 ppm
OSHA	PEL (ppm)	0.02 ppm
NIOSH	TWA (ppm)	0.0050 ppm

Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. If insufficient ventilation: wear respiratory protection



Personal Protective Equipment

Respiratory Protection:

Follow OSHA respirator regulation 29 CFR 1910.134 and European Standards EN 141, 143 and 371; wear a MSHA/NIOSH or European Standards EN 141, 143 and 371 approved respirators when needed.

Skin and Body Protection:

Wear suitable protective clothing. Wear chemically resistant protective gloves.

Eye Protection:

Chemical goggles or safety glasses.

Environmental Exposure Controls:

Do not allow the product to be released into the environment.

Consumer Exposure Controls:

Do not eat, drink or smoke during use.

Section 9: Physical and Chemical Properties

Appearance: Amber to brownish viscous liquid

Odor: Pungent aroma

Odor Threshold: 0.39 ppm (MDI)

pH: No data available

Freezing Point: No data available

Boiling Point: 400°F (204°C)

Flashpoint: 425°F (218°C) CC

Evaporation Rate: No data available (butylacetate=1)

Flammability: No data available

Lower Explosion Limits: Not determined

Upper explosion limits: Not determined

Vapor Pressure: Less than .00001 mm Hg @ 68°F

Relative Vapor Density at 20°C: No data available

Relative Density: No data available.

Solubility in Water: Reacts with water

Partition Coefficient n-octanol/water: No data available

Auto-ignition Temperature: No data available

Decomposition Temperature: No data available

Viscosity: No data available

Oxidizing Properties: No data available

Specific Gravity: 1.15 (water = 1)

Explosive Properties: Product is not explosive; however, formation of explosive air vapor mixture is possible.

Section 10: Stability and Reactivity

Reactivity

Hazardous reactions will not occur under normal conditions.

Chemical stability

Stable under recommended handling and storage conditions (see Section 7).

Possibility of hazardous reactions

May occur, contact with moisture and other materials, which react with isocyanates, or temperatures about 400°F (204°C), may cause some polymerization.

Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.

Incompatible materials

Water (moisture), metal compounds, acids, bases, and surface-active materials.

Hazardous decomposition products

Toxic fumes are released in fire situations, including isocyanate vapor and mist, carbon dioxide, carbon monoxide, nitrogen oxides, and traces of hydrogen cyanide.

Section 11: Toxicological Information

Acute Toxicity/Effects

Not Classified

4,4'-Methylenebis(phenyl isocyanate) (101-68-8)	
LD50 Oral Rat	9,200 mg/kg
LD50 Inhalation Rat	2.24 mg/l (1 hr.)
Skin Corrosion/Irritation	May cause minor skin irritation
Serious Eye Damage/Irritation	May cause mild eye irritation
Respiratory or Skin Sensitization	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ Cell Mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive Toxicity	Not classified
STOT (Single Exposure)	Not classified
STOT (Repeated Exposure)	Not classified
Aspiration Hazard	Not classified

Section 12: Ecological Information

Toxicity

4,4'-Methylenebis(phenyl isocyanate) (101-68-8)

EC50 Daphnia 1	0.35 mg/l (Exposure time: 24 h - Species: Daphnia magna [Static])
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Persistence and Degradability:

No additional information available.

Bioaccumulative Potential:

No additional information available.

Mobility in Soil:

No additional information available.

Other Adverse Effects:

Avoid release to the environment.

Section 13: Disposal Considerations

Waste Disposal Recommendations:

Dispose of waste material in accordance with all local, regional, national, & international regulations.

Sewage Waste Recommendations:

Do not dispose of waste into sewer.

Section 14: Transport Information

DOT (Department of Transportation)

Proper Shipping Name: Liquid Resin (Non-Regulated)

Hazard Class: Non-regulated

UN Number: Not applicable

Packing Group: None

Label: Not applicable

Placard: Not applicable

NMFC (National Motor Freight Carriers)

Freight Class: 55

IMO / IMDG CODE (OCEAN) HAZARD CLASS DIVISION NUMBER: Non-regulated/Not dangerous goods

ICAO / IATA (AIR) HAZARD CLASS DIVISION NUMBER: Non-regulated/Not dangerous goods

Section 15: Regulatory Information

US Federal Regulations

SARA Section 311/312 Hazard Classes: Acute Health Hazard

SARA Section 313 Components

Diethylene Glycol Ether Acetate (112-15-2)

4,4'-Methylenebis(phenyl isocyanate) (101-68-8)

Oxirane, methyl-, polymer with oxirane, ether with 1,2,3-propanetriol (3:1), polymer with 1,1'-methylenebis[4-isocyanatobenzene] (59675-67-1)- Listed on the United States TSCA (Toxic Substances Control Act) inventory

US State Regulations

4,4'-Methylenebis(phenyl isocyanate) (101-68-8)

U.S. - Pennsylvania - RTK (Right to Know) List
 U.S. – New Jersey - RTK (Right to Know) List
 U.S. – Massachusetts – RTK (Right to Know) List

Section 16: Other Information

Skin Sens. A H317 Skin sensitization Category 1
 Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

NFPA 704M ratings:	Health 2	Flammability 1	Reactivity 1	Other
HMIS ratings: 0-Insignificant 1-Slight 2-Moderate 3-High 4-Extreme	Health 2	Flammability 1	Physical Hazard 1	Personal Protection G

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February 19, 2018

Bob O' Connor
Municipal & Contractors Sealing Products, Inc.

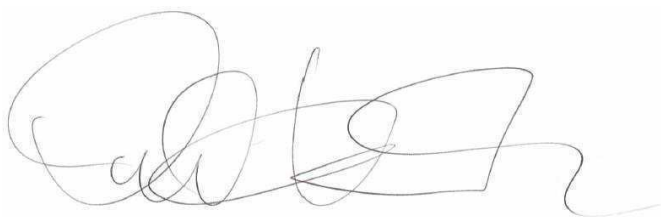
To Whom It May Concern:

This letter is to confirm that Municipal & Contractors Sealing Products, Inc. is an approved and fully trained applicator of Avanti International's products including, but not limited to AV-100, AV-101, AV102 and other additives, as well as .

The people of Municipal & Contractors Sealing Products, Inc. purchase these products from Avanti International and have experience in the use and handling of these Avanti International products. We confidently and highly recommend them for all your waterproofing needs.

If you have any questions concerning this or other matters, please feel free to contact me at 800-877-2570 or via email at michael.harada@avantigrout.com.

Sincerely,



Michael Harada
Senior Support Specialist