

Technical Data Sheet



Willamette Valley Company

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PERFORMANCE PRODUCTS

Partnering through service,
innovation, and integrity

POLYQuik® HPRG TYPE-1 MD

Meter-Dispensed - High Performance Rail Grout

DESCRIPTION

POLYQuik® HPRG TYPE-1 MD is a polyurethane system designed to fill space between transportation rail and concrete. It minimizes rail deflection, absorbs vibrations without cracking, and electrically isolates the rail. POLYQuik® HPRG TYPE-1 MD is delivered in meter-ready totes, drums, or pails and can be applied directly over a gravel extender.

WHERE TO USE

- **Vooids**—between the rail and concrete
- **Special Track**—intersection and stations
- **Over Structures**—parking garages and tunnels
- **Rail Maintenance**—track repair or replacement

FEATURES AND BENEFITS

- **Fast Curing**—reopen to traffic quickly
- **Electrical Isolation**—excellent track-to-earth resistance
- **Sound Dampening**—reduces acoustic noise
- **Vertical Stiffness**—minimizes lateral displacement
- **Zero VOC**—environmentally friendly

PACKAGING

5-gallon buckets
50-gallon drums
200-gallon totes

COLORS

Gray

YIELD

25-gallon bucket set = 3.3ft³ (0.095m³)
50-gallon drum set = 6.7ft³ (0.189m³)
250-gallon tote set = 33.4ft³ (0.946m³)

SHELF LIFE

1 year when properly stored.

STORAGE

Store and ship this product in a clean, dry, low-humidity, shaded or covered environment at 60 to 90° F (15 to 32° C).

TECHNICAL INFORMATION

Typical Properties

Adhesion to Steel psi (MPa), ASTM D 4541	750 (5.17)
Adhesion to Concrete , psi (MPa), ASTM D 7234	500 (3.4) 100%
Compressive Set , %, ASTM C 395	< 0.5
Compressive Modulus , %, at 250 psi, ASTM C 575	5
Dielectric Strength , volt/mil, ASTM D 149	> 410
Dynamic Deflection , ASTM D 5992	No Failure
Volume Resistivity, Extended with WVCO-Approved Gravel , ohm-cm, 75° F 50% RH, ASTM D	1.5 x 10 ¹²
Volume Resistivity, Non-Extended , ohm-cm, 75° F 50% RH, ASTM D 257	1.75 x 10 ¹²
Gel Time , minutes, 70° F (21°C)	8
Tack Free Time , minutes, 70° F (21°C)	60
Elongation , %, ASTM D 412	80
Hardness , Shore A, ASTM D 2240	85
Tensile , psi (MPa), ASTM D 412	800
Recoat Time , minutes / max, hours, 70° F (21°C)	60 / 24
Service Temperature ° F (° C)	-40 to 150 (-4.4 to 65)
Viscosity , cps, ASTM D 4878, Mixed	2,000
VOC , lbs/gal (g/L), ASTM D 2369	0

Chemical Resistance, ASTM D 471 75° F for 7 days.

Chemical	% Wt. Change	% Vol. Change
Water	< 0.1	< 0.1
10% NaCl	< 0.1	0.7
10% CaCl ₂	< 0.1	0.7
5% H ₂ SO ₄	< 0.1	0.5
5% NaOH	< 0.1	1.3
ASTM Oil #1	1.75	2.0
ASTM Oil #3	2.0	2.5
ASTM Fuel A	2.2	1.8

Processing Parameters

Application Temperature ° F (° C)	50 to 90 (10 to 32)
Application Method	WVCO Meter with Static Mixer 13-32
Application Ratio	4:1 by Volume

APPLICATION

SURFACE PREPARATION

CONCRETE

1. The concrete surface being repaired must be fully cured 28 days, structurally sound (200psi or greater according to ASTM D7234), clean (ASTM D4258), and dry (less than 5%, ASTM E1907).
2. The surface should have a low moisture-vapor transmission (less than 3lb/24hr/1000ft², RMA Test Method)
3. Concrete surface must be dry and clean. Any water or oil present will result poor adhesion. Apply product only if surface temperature is 5° F (3° C) above the dew point to avoid application over damp surface.
4. Use a steel bristle brush to remove dirt on vertical and horizontal concrete surfaces and use compressed air to blow out prior to applying product.
5. Remove any contaminants before profiling surface.
6. It is recommended to profile surface according to ICRI Guide 03732 to a minimum of CSP 3 by abrasive blasting.
7. As necessary, saw cut any spalled areas in shape of a square 3 inches deep, hammer (15 lb) spall area and remove debris. Recommended repair size is less than 10 ft² (1m²).
8. Use a minimum 150 PSI continuously dry compressed air to blow out loose debris, dirt and dust prior to applying product. Moist concrete can be torched dry. If moisture returns immediately after torching, stop and do not install HPRG in this area.
9. As necessary, plug all gaps or joints surrounding the spall area with foam backer rod and choose a backer rod width that fits tightly in the area.
10. For spalled areas and joints, honor all joints or moving cracks in the spall area by saw-cutting after HPRG has cured.

STEEL

1. Steel surfaces must be cleaned before blasting (SSPC-SP1) Remove any sharp edges and other surface imperfections.
2. Dry abrasive blast surface according to SSPC SP-6/NACE No. 3.
3. Remove any non-visible soluble salt contamination (less than 3mg/cm², NACE 6G186, CHLOR*RID)

PRIMING

1. Priming all concrete surfaces is recommended. Prime with POLYQuik® 1K Primer or POLYPrime. Test primer adhesion to the concrete in a section representative of the rail trough. Test according to ASTM D4541.
2. To minimize contamination of adjacent surfaces apply masking tape before priming and remove before the sealant has begun to thicken and set.
3. Prime a thin, uniform film (typically 1–3 mils). Avoid excess film buildup and application of primer beyond trough area. Excess primer should be blown out of the rail trough with 150-psi dry air while still liquid.
4. Contact Willamette Valley Co. for specific recommendations on further priming applications. Consult technical data sheets for the specific primer that is selected.

OTHER MATERIALS

1. Previously installed polymer materials must be tested to determine the best method of preparation to achieve acceptable adhesion. Consult manufacturer for recommendations. Typically, methods will include solvent cleaning, abrading and vacuuming surface.
2. HPRG is not typically recommended for use in or around asphaltic roadways. Exceptions do occur; contact Willamette Valley Co. for more details.

GRAVEL EXTENDER INFORMATION

1. Use WVCO approved gravel to achieve typical properties. Gravel may be purchased from multiple sources. Gravel should be approximately 3/8" round rock that must be washed, clean and dry.
2. Gravel typically makes up for 40-50% of the repair volume.
3. Estimate 20 lbs of gravel for each gallon of mixed resin/iso.

4. Gravel can be pre-approved by WVCO before use. Contact WVCO for gravel testing and approval.

PROCESSING

1. Use WVCO meter or equivalent at a 4:1 ratio by volume (resin:iso). For specific metering solutions contact Willamette Valley Company Precision Technologies Division for equipment recommendations.
2. Precondition the resin, iso and gravel to 70°F (21°C) for 24 hours before using.
3. Resin, iso, and gravel can be heated up to 100°F (38°C) to speed cure at colder temperatures. It is recommended to heat all components when the temperature falls below 50°F (10°C).
4. Mechanically mix resin for at least 30 minutes before proportioning begins. Use a mixer fitted with blades that are 1/3 the diameter of the container to redistribute any settled material.
5. Test the meter operation of HPRG before dispensing in rail area. Use a 13-mm diameter mix tube with 32-elements or recommended equivalent (contact Willamette Valley Co. for approved equivalents). Initially dispense into a mold-released container. Verify HPRG color/mixing is uniform and the material sets uniformly in 1-hour at 70°F (21°C). Cut container away from cured urethane to thoroughly inspect material.
6. Do not proceed if test product does not set. Troubleshoot the problem or contact a WVCO Representative for assistance.

APPLICATION

1. Formwork and other supports must be installed such that the product can be placed continuously and as quickly as possible.
2. Allow any primers to cure according to specifications.
3. Dispense product into a waste container until uniform and all air has been sufficiently purged from the metering system.
4. Various light rail systems and geometries exist. It is the responsibility of the contractor and engineer alike to devise the most suitable application method and technique. The following application instructions are general guidelines.
5. Light rail systems exist that may or may not require gravel as an extender. Contact WVCO for more details.
6. For gravel extended applications, dispense a layer of HPRG on the floor of area.
7. Add gravel to required lift height while the layer of HPRG on the floor is still liquid.
8. Using two meters on both sides of the rail, move the flow front of the resin down the length of the trough in unison, filling the gravel layer to refusal. Allow first lift to cure for one hour or until sufficient cure has been achieved.
9. Remove hanger system and repeat process for subsequent lifts.
10. Avoid overfilling, fill the through level or just 1/8" below surrounding concrete surface. In cases where trough elevations differ, fill to the lower slab height.
11. Replace static mixer when application stops for more than 2-minutes or after each work-shift.

NOTE: Material is tack free in approximately in 1-hour at 70°F (21°C). Colder temperatures will slow the cure. Warmer temperatures will speed the cure. Return to service time is typically 4-hours at 70°F (21°C).

NOTE: HPRG is an aromatic compound, discoloration from UV light may occur, however, the physical properties are typically unaffected.

CLEANING & MAINTENANCE

- Clean equipment with POLYQuik® Cleaner or acetone immediately after use. Cured material must be removed mechanically.

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