APPLIED FRAME-CHIMNEY FLEXIBLE INTERNAL SEAL
COR+SEAL™ & COR+FLEX™ BY AP/M PERMAFORM®

1 Intent: It is the intent of this specification to provide minimum standards for materials and methods for waterproofing, sealing and corrosion protection of existing manholes frame and adjusting ring interface.

2 Applicability: These repair means and methods may be engineered for the depth, diameter, shape, traffic loading, groundwater pressures and condition of each manhole.

3 Referenced Standards

3.1	ASTM D-4541	Pull-off Strength of Coatings Using a Portable Adhesion Tester
3.2	ASTM D-4414	Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages
3.3	NACE RP0274	High Voltage Electrical Inspection of Pipeline Coating Prior to Installation
3.4	NACE 6/ SSPC-SP 13	Surface Preparation of Concrete

4 Inflow Control

4.1 **COR+SEAL™ Applied Interior Seal**

4.1.1 COR+SEAL™ is a two component, aliphatic, chemically curing, urethane sealant formulated as a high build coating to seal the adjustment ring to the casting of manholes and catch basins. Provides corrosion protection and abrasion resistance. Designed to provide superior flexibility to absorb ground movement from dynamic traffic loads and freeze-thaw cycles and extended water immersion when applied to the inside wall of the adjustment ring.

4.1.2 Physical Properties of COR+SEAL™

Tensile Strength	ASTM D 412	1100 psi
Elongation	ASTM D 412	750%
Adhesive Strength	ASTM D 903	175 l/in.
Tear Resistance	ASTM D 1004	165 l/in.
Hardness	ASTM D 2240	72
Movement Capability	ASTM C719	50%
Hardness (Shore A)	ASTM C661	50
Low Temperature (Flexibility @ -4°F)	ASTM D1790	Pass
Heat Aging	ASTM C920	2%
Recovery	ASTM C920	98%
Shelf Life @ 70°F in sealed containers		9 months
Bond Durability	Test Blocked at 25% for 48 hours	
Water Immersion	Samples on masonry block will withstand water immersion while elongated 50%	

4.1.3 COR+SEAL™ Installation: After preparing the surface by sand blasting to remove loose material and rust, brush on primer coat. When primer coat becomes tacky, thoroughly mix parts A & B separately. Combine A & B and mix thoroughly and trowel or brush this mixture onto the prepared surfaces at a thickness of 80 to 100 mils. Overlap the bottom portion of the casting and the top of the lowest adjustment ring by 3 ". The flexible sealant will become tack free within 60 minutes and fully cured within 24 hours.

4.2 COR+FLEX ™ Applied Interior Seal

4.2.4 COR+FLEX is a two-component, high performance urethane elastomeric coating specifically designed for high build applications and immediate return to service. When fully cured, COR+FLEX forms an effective abrasive resistant rubber-like coating, especially suited for applications requiring protection from impact, abrasion or corrosion on metal or concrete surfaces. The system has added UV stabilizers and provides corrosion, weather, and abrasion resistance to various surfaces including concrete and cast iron.

4.2.5 COR+FLEX Physical Properties

Property	B Component	A Component	
Appearance at 25°C		Blue Liquid	White Liquid
Specific Gravity at 25°C		1.09	1.04
Viscosity at 25°C, mPa's		2,500	1,500
Flash Point, PMCC, °c		216	179
VOC,%		0	0
		Unit	Value
Specific Gravity	D792		1.083
Density	D792	lb/ft3	67
Hardness	D2240	Shore A	85
Taber Abrasion	D4060		
H-18 Wheel, 1000-g Load, 1,000 Cycles		mg/loss	190
Tensile Strength:	D412	lb/in2	1,330
Ultimate Elongation	D412	%	580
Tear Strength			
Die C	D624	lbf/in	330
Split	D1938	lbf/in	140
Water Absorption:			
30 Days	D570	%	1.0
Crack Bridging 1000 Cycles	C 957	-	passes

4.2.6 COR+FLEX Installation: Surfaces to be coated must be clean and dry. Sandblast the casting to remove any loose debris and rust. Power wash to remove any debris left from sandblasting and ensure the masonry interface is free of debris, release oil, or other contaminants. Apply primer to areas to receive COR+FLEX. Once the primer becomes tacky begin applying COR+FLEX. Applying COR+FLEX is similar to spraying paint. You must keep the spray pattern perpendicular to the surface being sprayed. Maintain a nice straight smooth motion. To achieve the best coverage, each pass of the spray pattern should overlap the preceding pass by approximately 1/3. COR+FLEX can be applied in thicknesses from about 30 mils to 1/2" or more. On horizontal surfaces, thicknesses of about 1/8" can be achieved in a single pass. On vertical surfaces be careful not to apply too quickly or thick in one spot. If running occurs, control by: 1) traversing across the surface faster, 2) moving the spray gun away from the surface, or 3) reducing the

output of the spray gun. Multiple layers to achieve desired film thickness is possible with multiple coats, however the time between layers should not exceed 40 minutes.

5 Submittals

5.1 All submittals shall conform to the requirements of the Contract document.

5.2 In addition, the following items may be required of the installer to be submitted to the engineer at the sole discretion of the engineer. This Contract shall not be considered complete until receipt and acceptance of the following:

5.2.1 Reference submittals
- 5.2.1.1 Contractor certification
- 5.2.1.2 Material certification

5.2.2 Product data
- 5.2.2.1 Flexible Chimney Sealant

6 Product Handling

6.1 Proper protective clothing and breathing apparatus shall be used to avoid direct contact with the liquid components of COR+FLEX AND COR+SEAL if hand spraying or brushing by man entry. When spraying with spinner head, breathing apparatus is not required. Manufacturer's material safety data sheets shall be kept on site and the applicator shall ensure familiarization with this information and emergency procedures.

7 Quality Assurance and Acceptance

7.1 Visual inspection should verify a leak-free, uniform appearance.

7.2 A portable adhesion tester may be used to verify bond strength of the COR+GARD®protective coating per ASTM D-4541, Pull-off Strength of Coatings Using a Portable Adhesion Tester.

7.3 Spark testing is an excellent test of the thickness for continuity and thoroughness of protective coatings like COR+GARD®and embedded plastic linings. NACE RP0274 testing standard will detect bubble or blister type voids, cracks, thin spots, and foreign inclusions or contaminants in the coating. Any area found to be a defective shall immediately receive additional material.

7.3.1 All work shall be performed by factory certified applicators in accordance with T&R testing voltage. The dielectric strength of COR+ GARD® requires testing at 100 volts per each mil of thickness.

8 Measurement for Payment:

8.1 Payment shall be made at the unit price per installation.