

VIRGINIA DEPARTMENT OF TRANSPORTATION

MATERIALS DIVISION

MEMORANDUM

GENERAL SUBJECT: Pipe Joints and Connections and Pipe Coatings	NUMBER: MD 397-16
SPECIFIC SUBJECT: Revision to VDOT Manual of Instructions Section 204.19(i) on how VDOT accepts pipe gasket, joint, connection, and coating materials; Revision to Approved List #14 Pipe Gaskets and Coatings	DATE: Apr 12, 2016
	SUPERSEDES:
APPROVED:	Charles A. Babish, PE State Materials Engineer Approved: _____

EFFECTIVE DATE

- This memorandum is effective starting with contracts advertised in 2016, in conjunction with revisions to VDOT Road and Bridge Specification 212, 232, and 302, and Approved List No. 14.
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PURPOSE/NEED/SCOPE/REQUIREMENTS

- VDOT re-evaluated its pipe selection procedures. As part of that process, pipe joint and connection design was evaluated, and Approved List No. 14 and the Manual of Instructions (MOI) have been revised and updated accordingly.
 - Pipe joints and connections shall be listed as soil-tight, silt-tight, or leak-resistant in accordance with AASHTO Provisional Specification 63 and VDOT exceptions. The manufacturers will submit materials and joint certifications for review to VDOT Materials for listing on the approved list.
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PROCEDURES

The existing Section 204.19(i) is deleted and replaced with the following:

- **SECTION 204.19(i) Pipe Joints and Connections and Pipe Coatings**

Gaskets, bands, and other joint materials, and joint configurations where they are used, shall be submitted to the Materials Division for review and listing on Approved List No. 14. Joint test

certifications shall also be submitted to qualify joints as silt-tight or leak-resistant. Any change in joint configuration or material shall require a resubmission of material and joint certifications. Pipe coating materials shall also be submitted for listing on Approved List No. 14.

NOTES

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REFERENCES

- VDOT Road and Bridge Specification 212, 232, 302.
 - AASTHO Provisional Specification 63.
 - VDOT Approved List No. 14 Pipe Joints and Connections and Pipe Coatings.
 - VDOT IIM-LD-254.
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Old Dominion Highway Contractors Association
American Concrete Pipe Association
Plastics Pipe Institute
National Corrugated Steel Pipe Association

(14) Pipe Joints and Connections and Pipe Coatings– (Soils Lab)

April 11, 2016

The following joint and connection materials and joint and connection types and configurations are listed categorically by pipe type for which they are used and classified according to their tightness per AASHTO PP 63 (soil-tight, silt-tight, and leak-resistant). Approvals are good for 5 years. Sections 212, 232, and 302 of the VDOT Road and Bridge Specifications reference this approved list. Special design joints require a project Special Provision.

Note: Any leak-resistant joint is also silt-tight and soil-tight, and any silt-tight joint is also soil-tight. Higher classification joints are not listed again separately for the lower classifications.

Any geotextile filter fabric used for wrapping joints shall be from the Drainage Fabric category of VDOT Approved List #63, Geosynthetics. Other types of manufactured wraps must be on this approved list.

Nitrile gaskets shall be considered oil-resistant.

CONCRETE PIPE, PIPE ARCH, BOX CULVERTS, AND MANHOLES

Soil-Tight Joints

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man’f/Vendor & Facility Location
Material meeting ASTM C990: Butyl-Tite E-Z Stick RV 30	Any pipe or arch with tongue and groove or bell and spigot joints	None	MultiSeal, Inc. Evansville, IN Concrete Products Supply Co. Fort Wayne, IN Ru Van, Inc. Evansville, IL
M-30-B Butyl Sealant Butyl-Nek BN109 Ram-Nek Flexible Sealant RN103 Plastic	Any concrete pipe or box culvert with tongue and groove, bell and spigot, single offset, or O-ring joints	None	Delta Pipe Products Gainesville, GA Henry Company El Segundo, CA

Ram-Nek RN101 preformed flexible plastic sealant			
Rub'R Nek LTMRN106 butyl rubber sealant	Any concrete pipe or box culvert with tongue and groove or bell and spigot joints	None	Concrete Sealants Inc. Tipp City, OH
ConSeal C-102 butyl rubber sealant			
ConSeal C-102B			
Clippership Bituminous Joint Compound MP-52 (asbestos-free trowel mastic)			
Material meeting ASTM D1056, Type 2A: R-427-N	Any box culvert with tongue and groove or bell and spigot joints	None	Press-Seal Gasket Corp. Fort Wayne, IN
Con Seal (CS101, 208)	Any pipe or arch with tongue and groove or bell and spigot joints	None	Concrete Sealants, Inc. New Carlisle, OH
Closed cell joint filler	Any concrete pipe or box culvert with tongue and groove, single offset, or O- ring joints	None	Press-Seal Corporation Ft. Wayne, IN
Sika Greenstreak Swellstop Primer Adhesive and Waterstop	Any concrete box culvert		Sika St. Louis, MO

Silt-Tight Joints – Requires independently certified plant verification test (ASTM C443 at 2 psi for straight and deflected position) (plant testing is not required for joints using external wraps)

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Material meeting ASTM C990: Con Seal (CS102, 202, 302)	Any pipe or arch with tongue and groove joints (3/4" for 12"- 30" dia pipe; 1" for 36"-48" dia pipe; 1-	Jan 1, 2017	Concrete Sealants, Inc.

	1/2" for 54"-72" dia pipe)		New Carlisle, OH
Material meeting ASTM C877, Type II: Macwrap and Seal Wrap, from 9" to 14" wide with 2 steel compression bands	Any pipe or arch or box culvert with tongue and groove, bell and spigot, single offset, or O-ring joints	None	Mar Mac Const. Products Co., Inc. 334 N. 7 th St. McBee, SC 29101
C-212 external joint wrap	Any concrete box culvert with tongue and groove joints	Jan 1, 2017	Concrete Sealants Inc. Tipp City, OH
Mar Mac DP Coupler, from 12" to 36" wide with 4 steel compression bands	Any concrete pipe or arch to any metal pipe or arch or concrete pipe to plastic pipe, in comparable diameters	Jan 1, 2017	Mar Mac Const. Products Co., Inc. 334 N. 7 th St. McBee, SC 29101

Leak-Resistant Joints – Requires independently certified plant verification test (ASTM C443 at 10.8 psi for straight and 10 psi in the deflected position)

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Material meeting ASTM C443 or C1619: Press Seal gaskets 158-4G	Foltz pipe with profile offset joint, 15"-36" dia.	Jan 1, 2017	Press-Seal Gasket Corp. Fort Wayne, IN
Press-Seal 4G gaskets	CP&P round and elliptical pipe with profile offset joint; round, 12"-96" diameter; elliptical, 23"x14" through 91"x48"	Jan 1, 2017	Foltz Concrete Pipe York, SC Press-Seal Gasket Corp. Fort Wayne, IN Concrete Pipe and Precast Hanover &

Delta Profile and O-ring rubber gaskets	Rinker concrete pipe with single offset joints	Jan 1, 2017	Chesapeake, VA; Jessup, MD; Oakboro, NC Delta Pipe Products Gainesville, GA Rinker Pipe
Press Seal gaskets 210-4G	Foltz pipe with profile offset joint, 42"-72" dia.	Jan 1, 2017	Press-Seal Gasket Corp. Fort Wayne, IN Foltz Concrete Pipe York, SC
Material meeting ASTM C443 or C1619 or C361: Press-Seal O-ring gaskets	CP&P round pipe with confined O-ring joint, 12"-108" diameter	Jan 1, 2017	Concrete Pipe and Precast Hanover, Chesapeake, Salem, VA; Jessup, MD; Oakboro, NC Press-Seal Gasket Corp. Fort Wayne, IN
Material for vertical joints meeting ASTM C990: Butyl-Tite E-Z Stick RV 30 Con Seal (CS102, 102B)	CP&P round manhole sections with tongue and groove or profile offset joint, 48"-126" diameter	None	Concrete Pipe and Precast Ashland, Harrisonburg, Salem, VA; Martinsburg, WV ; Greencastle, PA MultiSeal, Inc. Evansville, IN Concrete Products Supply Co. Fort Wayne, IN Ru Van, Inc. Evansville, IL Concrete Sealants, Inc. New Carlisle, OH

Material for vertical joints meeting ASTM C443: Press-Seal 4G gaskets	CP&P round manhole sections with profile offset joint, 48"-120" diameter	Jan 1, 2017	Press-Seal Gasket Corp. Fort Wayne, IN Concrete Pipe and Precast Ashland, Harrisonburg, Salem, VA; Martinsburg, WV ; Greencastle, PA
Material for vertical joints meeting ASTM C443 or C361: Press-Seal O-ring gaskets	CP&P round manhole sections with confined O-ring joint, 48"-126" diameter	Jan 1, 2017	Press-Seal Gasket Corp. Fort Wayne, IN Concrete Pipe and Precast Salem, VA; Martinsburg, WV

Soil-Tight Connectors – Concrete Pipe to Structure

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Brick and mortar connection.	Any pipe, arch, or box culvert and structure	None	N/A

Silt-Tight Connectors – Concrete Pipe to Structure

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Brick and mortar connection, with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1"-wide tightened metal bands.	Any pipe, arch, or box culvert and structure	None	N/A

Resilient connectors meeting ASTM C1478:			

Leak-Resistant Connectors – Concrete Pipe to Structure

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man’f/Vendor & Facility Location
Brick and mortar connection, with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1”-wide tightened metal bands.	Any pipe, arch, or box culvert and structure	None	N/A
Any flexible pipe connection meeting ASTM C923: A-Lok XL A-Lok Premium Z-Lok PSX: Direct Drive PSX: Positive Seal PSX: Nylo-Seal Kor-N-Seal	Any CP&P concrete manhole, box, or structure to any round pipe	Jan 1, 2017	Concrete Pipe and Precast Ashland, Chesapeake, Hanover, Harrisonburg, Salem, VA; Martinsburg, WV ; Greencastle, PA; Jessup, MD A-Lok 697 Main Street Tullytown, PA 19007 Press-Seal Corporation 2424 West State Blvd Fort Wayne, IN 46808 Trelleborg 250 Elm St. Milford, NH 03055

CORRUGATED METAL PIPE, ARCH, and PLATE

Soil-Tight Joints

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
Annular corrugated or helical corrugated pipe with annular rerolled ends with: partially-corrugated (end rerolled to a 2-2/3-by-1/2 in corrugation) or fully-corrugated bands and connectors of banded angle, oval lugs, or bar and straps	Any VDOT approved corrugated metal pipe or arch	None	Hardware (band angle, lugs, bolts, bars, straps): Nucor – LMP Steel, Inc. 2000 East First Street Maryville, MO 64468 Gaskets: Pro Tech Fabricators 801 Macon Street Bedford, VA 24523

Silt-Tight Joints – No test method currently specified in AASHTO PP-63; therefore, a minimum 10-ft section of pipe on each side of joint shall be assembled similar to field assembly in straight and deflected positions and tested as per Section 7 of ASTM D3212, but at 2 psi in the straight and deflected position (plant testing is not required for joints using external wraps)

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
Only annular rerolled ends with: partially-corrugated band, fully-corrugated band, or flat band, with O-ring gasket meeting ASTM D1056 and connectors of banded angle, oval and lugs, or bar and straps; and having a minimum 12-in wide double geotextile fabric wrap	Any VDOT approved corrugated metal pipe or arch	Jan 1, 2017	Hardware (angle, lugs, bolts, bars, straps): Nucor – LMP Steel, Inc. 2000 East First Street Maryville, MO 64468 O-rings:
Mar Mac Dissimilar Pipe (DP) Coupler, covering 2 corrugations each side of joint for rerolled	Any metal pipe or arch to any concrete pipe or arch or metal pipe to plastic pipe, in comparable diameters	Jan 1, 2017	Mar Mac Const. Products Co., Inc. 334 N. 7 th St. McBee, SC 29101

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Leak-Resistant Joints – No test method currently specified in AASHTO PP-63; therefore, a minimum 10-ft section of pipe on each side of joint shall be assembled in straight and deflected positions and tested as per Section 7 of ASTM D3212, but at 10.8 psi in the straight position and 10 psi in the deflected position

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
Annular rerolled ends with: partially-corrugated band, fully-corrugated band, flat band, or universal band, with 3/8” flat neoprene sleeve gasket meeting ASTM D1056 and connectors of banded angle, oval and lugs, or bar and straps, and double geotextile exterior wrap	Any VDOT approved corrugated metal pipe or arch; 12”-36” dia. require a 7” wide sleeve gasket; greater than 36” dia. require 10.5” wide sleeve gasket	Jan 1, 2017	Hardware (angle, lugs, bolts, bars, straps): Nucor – LMP Steel, Inc. 2000 East First Street Maryville, MO 64468 Gaskets: Pro Tech Fabricators 801 Macon Street Bedford, VA 24523

Soil-Tight Connectors – Metal Pipe to Structure

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
Brick and mortar connection. For corrugated pipe, 2 corrugations must be covered.	Any pipe or arch and structure	None	N/A
Waterstops	Any pipe or arch and structure	None	

Silt-Tight Connectors – Metal Pipe to Structure

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man’f/Vendor & Facility Location
Brick and mortar connection, 2 corrugations covered for corrugated pipe,	Any pipe or arch and structure	None	N/A

with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1”-wide tightened metal bands.			
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Leak-Resistant Connectors – Metal Pipe to Structure

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man’f/Vendor & Facility Location
Brick and mortar connection, 2 corrugations covered for corrugated pipe, with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1”-wide tightened metal bands.	Any pipe or arch and structure	None	N/A
Resilient connectors meeting ASTM F2510:	Any pipe or arch and structure		

PLASTIC PIPE

Soil-Tight Joints

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Split coupler, single or double wide, covering 2 corrugations each side of joint	12"-24" dia. ADS AASHTO M294 (N-12 plain end) pipe	None	Advanced Drainage Systems, Inc. 4640 Trueman Blvd., Hilliard, OH 43026
	30"-60" dia. ADS AASHTO M294 (N-12 plain end) pipe		McClarín Plastics 15 Industrial Dr., Hanover, PA 17331
Elastomeric gaskets meeting ASTM F477: SpringSeal gasket	12"-60" dia. in-line bell and spigot joint, ADS AASHTO M294 HDPE pipe.	None	SpringSeal, Inc. 800 Enterprise Pkwy. Ravenna, OH 44266
Soleno double bell with clips; bell with clips welded to pipe; bell with O-ring gasket	12" dia. Soleno HDPE pipe; 15"-36" dia. pipe; 42"-60" dia. pipe	None	Soleno 64 North Lane McAdam, NB E6J 1K6 Canada
Split coupler or banded coupler from same as pipe man'f, covering 2 corrugations each side of joint	Any VDOT approved plastic pipe, 12" to 60" dia.	None	
External cleated snap coupler, covering 2 corrugations each side of joint	Any VDOT approved plastic pipe, 3" to 12" dia.	None	

Silt-Tight Joints – Requires independently certified plant verification test (ASTM D3212 with a maximum test pressure of 2 psi)

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man'f/Vendor & Facility Location
Mar Mac Polyseal Coupler, covering 1 corrugation each side of joint with 2 steel compression bands	12"-60" dia. AASHTO M294 HDPE Pipe 12"-60" dia. AASHTO M330	Jan 1, 2017	MarMac Construction Products Co., Inc. 334 N. 7 th St. McBee, SC 29101

	Polypropylene Pipe		
Split coupler, single or double wide, covering 2 corrugations each side of joint, with external filter fabric wrap 1 ft each side of joint	12"-24" dia. ADS AASHTO M294 Type S or SP (N-12 plain end) pipe	Jan 1, 2017	Advanced Drainage Systems, Inc. 4640 Trueman Blvd., Hilliard, OH 43026
	30"-60" dia. ADS AASHTO M294 Type Sor SP (N-12 plain end) pipe	Jan 1, 2017	McClarín Plastics 15 Industrial Dr., Hanover, PA 17331
Mar Mac Dissimilar Pipe (DP) Coupler, covering 2 corrugations each side of joint with 4 steel compression bands	Any plastic pipe to any metal or concrete pipe, in comparable diameters	Jan 1, 2017	Mar Mac Const. Products Co., Inc. 334 N. 7 th St. McBee, SC 29101
Mar Mac Polyseal Coupler, covering 1 corrugation each side of joint with 2 steel compression bands	Any HDPE corrugated pipe	Jan 1, 2021	Mar Mac Const. Products Co., Inc. 334 N. 7 th St. McBee, SC 29101

Leak-Resistant Joints – Requires independently certified plant verification test (ASTM D3212 with a maximum test pressure of 10.8 psi)

Joint Materials	For Use With Joint Type/Configuration	Expiration Date	Man’f/Vendor & Facility Location
Elastomeric gaskets meeting ASTM F477: Press-Seal 10.8 psi gasket Vertex 10.8 psi gasket Hamilton Kent 10.8 psi gasket	In-line bell and spigot joints, ADS 12"-60" dia. AASHTO M294 HDPE or 330 Polypro pipe.	None	Press-Seal Corporation 2424 West State Blvd Fort Wayne, IN 46808 Vertex, Inc. 3956 Mogadore Industrial Pkwy Mogadore, OH 44260 Hamilton Kent 740 Baxter Lane Winchester, TN

Trelleborg 10.8 psi gasket			37398 77 Carlingview Drive Toronto, ON M9W 5E6 Canada Trelleborg 250 Elm St. Milford, NH 03055
Soleno bell with O-ring gasket (gasket also meets NQ 3624-120)	Soleno bell HDPE 42"-60" dia. pipe	Jan 1, 2017	Soleno 64 North Lane McAdam, NB E6J 1K6 Canada
Rubber gaskets meeting ASTM C1173: Mission rubber coupler	12"-60" AASHTO M294 HDPE and M330 Polypro pipe	Jan 1, 2017	Mission Rubber 1660 Leeson Lane Corona, CA 92879
10.8 psi elastomeric gasket.	In-line bell and spigot joints, ADS 12"-60" dia. AASHTO M294 HDPE or 330 Polypro pipe.	Jan 1, 2017	Polska SP ZO.O Oddzial Bielsko-Bial, UL. Montazowa 7, 43-300 Bielsko-Biala, Poland
Soleno double bell with integrated (co-injected into bell) gasket with clips	Soleno double bell (bell meets CSA B182.8 Type I) HDPE 12"-36" dia. pipe	Jan 1, 2017	Soleno 64 North Lane McAdam, NB E6J 1K6 Canada

Soil-Tight Connectors – Plastic Pipe to Structure

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man'f/Vendor & Facility Location
Brick and mortar connection. For corrugated pipe, 2 corrugations must be covered.	Any pipe or arch and structure	None	N/A
Rubber boot connection pre-cast into structure, secured to corrugated pipe	12"-60" dia. AASHTO M294 HDPE or M330 Polypro pipe	None	A-Lok (12" to 60" dia.) 697 Main Street Tullytown, PA 19007

<p>stub with or without smooth solid HDPE sleeve welded over corrugated portion of pipe stub.</p>			<p>Press-Seal Corporation (12" to 60" dia.) 2424 West State Blvd Fort Wayne, IN 46808</p> <p>Trelleborg Kor-N-Seal (12" to 60" dia.) 250 Elm St. Milford, NH 03055</p>
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Silt-Tight Connectors – Plastic Pipe to Structure

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
<p>Brick and mortar connection with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1"-wide tightened metal bands.</p>	<p>Any pipe</p>	<p>None</p>	<p>N/A</p>

Leak-Resistant Connectors – Plastic Pipe to Structure

Joint Materials	For Use With Joint Type/ Configuration	Expiration Date	Man’f/Vendor & Facility Location
<p>Brick and mortar connection with double exterior geotextile wrap. Wrap to extend 2 ft. over pipe and around entire structure – to be held in place with minimum 1"-wide tightened metal bands.</p>	<p>Any pipe</p>	<p>None</p>	<p>N/A</p>
<p>Compression gasket pre-cast into structure, with solid HDPE sleeve welded over</p>	<p>12"-60" dia. AASHTO M294 HDPE or M330 Polypro pipe; <24"</p>	<p>Jan 1, 2017</p>	<p>A-Lok (12" to 60" dia.; Z-Lok 12"-36" dia.) 697 Main Street</p>

corrugated portion of pipe stub or with PVC bell to smooth PVC stub.	dia. when used with ADS Nyloplast		Tullytown, PA 19007
Rubber booted connection pre-cast into structure, secured to corrugated pipe stub.	12"-60" dia. AASHTO M294 HDPE or M330 Polypro pipe; <24" dia. when used with ADS Nyloplast	Jan 1, 017	Press-Seal - PSX Direct Drive 2424 West State Blvd Fort Wayne, IN 46808 Trelleborg - Kor-N-Seal 250 Elm St. Milford, NH 03055

PIPE COATINGS (for corrosion protection)

Brand Name/Material	Manufacturer
Bitumastic 50, 300M	Koppers Company Pittsburgh, PA
Cooper Black #750	Coopers Creek Chemical Corp. West Conshohocken, PA
40 mils bonded PVC pre-coating	Any