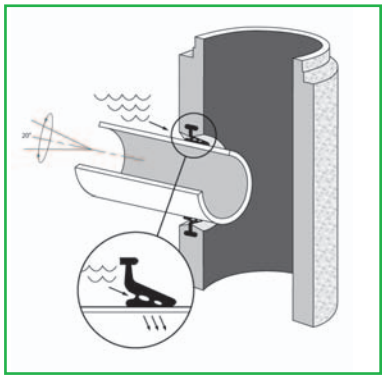
A-LOK PRODUCTS, INC.

The Company With Connections®

INCOMPARABLE PIPE-TO-MANHOLE CONNECTORS FOR SANITARY SYSTEMS

X-CEL

A•LOK X-CEL



Designed to produce a guaranteed watertight seal between pipe and concrete, the **A•LOK X-CEL** flexible pipe-to-manhole connector provides maximum performance on the job site. Its unique design not only saves valuable project time, but also ensures longevity and offers unsurpassed environmental benefits.

A•LOK X-CEL connectors prevent infiltration and ex-filtration into wastewater or stormwater systems, and are installed in the precast structure in a way that does not require coring or placement after the base component is cast. This eliminates residual waste from coring, disposal of the slugs or wasted raw material utilization or energy. Once cast-in, the connector becomes an integral component of the structure wall.

Based on the traditional A•LOK connector, the X-CEL's enhanced features improve performance. Take the patented “water pocket” for example, which utilizes the untapped pressure of ground water to exert a clamping force around the connector and pipe, allowing the connector to perform in deeper installations.

Demonstrated in tests higher than 15 psi of hydrostatic water pressure, the X-CEL's unique design provides 45 percent more rubber contact with the pipe, allowing for greater pipe deflection.

MATERIAL

Molded or extruded from compounds formulated for wastewater applications and engineered to conform to the requirements of section 4.1.1 of ASTM C-923, the standard rubber connector is available in alternative compounds upon request. Contact an A•LOKrepresentative regarding special applications, such as the presence of hydrocarbons.

KEY ADVANTAGES

The A•LOK X-CEL offers distinct advantages for engineers, specifiers, precasters and municipalities. An enhanced profile gives the connector 45% greater rubber contact with the pipe, thus allowing the pipe to be deflected in excess of 10 degrees of omnidirectional deflection, all the while maintaining a watertight seal. These enhancements allow for more flexibility to compensate for pipe shear due to settlement or ground movement.

KEY ADVANTAGES (continued)

On larger-diameter pipe, where size prohibits a gasket from being installed in a flat plane, the X-CEL can be configured for casting in a curve with the connector staying perpendicular to the center line of the pipe. Discovered through years of extensive research and development, the configurations cause no loss of compression or deflection.

Functioning on pure compression, the X-CEL allows for fast and easy field installation. After the connector and pipe are cleaned and lubricated, the pipe is simply centered in the connector and inserted. Backfilling can be done immediately, thus enhancing project safety and overcoming the typical problems of water, running sand and other unstable trench conditions.

For Specifiers, the X-CEL connector offers a guaranteed solution to the age-old containment system problem of the best way to connect pipes and concrete structures. Precasters using X-CEL connectors experience increased satisfaction due to their ability to offer a complete watertight, guaranteed product, while municipalities that install X-CEL will ultimately spend less on road repair by avoiding the possibility of pot/sink holes that are often the result of leaking, non-connected, systems.

PRODUCT REFERENCES

A.) ASTM C-923-00
Resilient Connector Between Reinforced Concrete Manholes Structures, Pipe and Laterals.

B.) ASTM C-1244-00
Standard Test Method For Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test

C.) ASTM C-478C
Standard Specification for Precast Reinforced Concrete Manhole Sections

PERFORMANCE STANDARD

The A•LOK X-CEL guaranteed Connector meets or exceeds all material and test requirements outlined in ASTM C-923: *“Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.”*

Molded or extruded from compounds formulated for wastewater applications, the standard rubber connector is engineered to confirm with the requirements of section 4.1.1 of ASTM C-923. Alternative compounds are available upon special request.

PERFORMANCE STANDARD (continued)

RESILIENT TEST REQUIREMENTS OF A.S.T.M. C-923-00

TEST	RESULTS	ASTM METHOD
Chemical resistance 1 N Sulfuric acid 1 N Hydrochloric Acid	 no weight loss no weight loss	 at 22°C for 48h
Tensile strength	1200 psi or 8.5 MPa, min	D 412
Elongation at break	350% min.	
Hardness	±5 from mfg's. specified hardness	D 2240 (Shore A durometer)
Accelerated oven-aging	decr. of 15%, max. of original tensile strength, decr. of 20% max. of elongation	D 573, 70±1°C for 7 days
Compression set	decr. of 25%, max. of original deflection	D 395, Method B, at 70°C for 22h
Water absorption	increase of 10%, max. of original by weight	D 471, immerse 0.75 by 2-in. or 19 by 25-mm Specimen in distilled water at 70°C for 48h
Ozone resistance	rating 0	D 1171
Low-temp brittle point	no fracture at -40°C	D 746
Tear resistance	200 lbf/in. or 34 kn/m	D 624, Method B

PART 6 • DIMENSIONAL DATA

A•LOK X-CEL Cross Sections / Pipe Size OD's

92 Molded Series • 4.25" - 7.25"

93 Molded Series • 8.50" - 13.00"

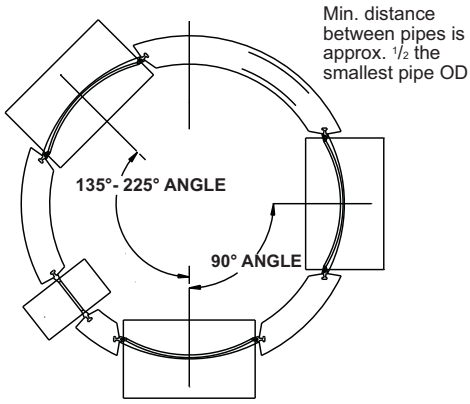
93 Extruded Series • 13.25" - 29.00"

94 Extruded Series • 30.00" - 59.50"

95 Extruded Series • 60.00" - 87.50"

Larger Sizes Available Upon Special Request

PART 6 • DIMENSIONAL DATA (continued)



MAX. PIPE SIZE OD's

Manhole Diameter	135° - 225° Pipe Angle	90° Pipe Angle
42"	26.5"	22.0"
48"	31.5"	25.0"
60"	42.0"	32.0"
72"	52.5"	38.0"
84"	59.5"	44.0"
96"	73.5"	50.0"
108"	76.0"	56.0"
120"	85.0"	62.0"

PRODUCT SPECIFICATIONS

A flexible pipe to manhole connector shall be used whenever a pipe penetrates into a precast concrete manhole or structure. The connector shall be the A•LOK X-CEL CONNECTOR as manufactured by A•LOK PRODUCTS, INC., Tullytown, PA, or approved equal.

The design of the connector shall provide a flexible, watertight seal between the pipe and concrete structure. The connector shall assure that a seal is made between:

(1) The connector and the structure wall by casting the connector integrally with the structure wall during the manufacturing process in a manner that it will not pull out during pipe coupling. The connector shall also be capable of being cast into a round structure by curving the connector in a manner that allows it to remain centrally located within the structure wall and perpendicular to the pipe. This configuration will result in no loss of seal or deflection of pipe entering a concrete structure.
(2) The seal between the connector and the pipe shall be made by the compression of the connector between the outside circumference of the pipe and the interior hole opening of the structure. The connector shall be the only component to affect the seal between the pipe and structure.

The connector shall be made from materials that conform to the physical and chemical requirements outlined in Section 4, *"Materials and Manufacture"* of ASTM C-923 Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals, and the overall design will meet or exceed Section 7, *"Test Methods and Requirements"* of ASTM C-923.

The connector shall be sized specifically for the type of pipe being used and shall be installed in accordance with the recommendations of the manufacturer.

PRODUCT SPECIFICATIONS (continued)

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The connector shall be made from materials that conform to the physical and chemical requirements outlined in Section 4, *"Materials and Manufacture"* of ASTM C-923 Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals, and the overall design will meet or exceed Section 7, *"Test Methods and Requirements"* of ASTM C-923.

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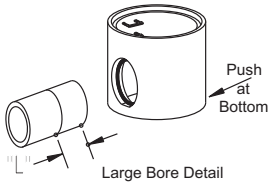
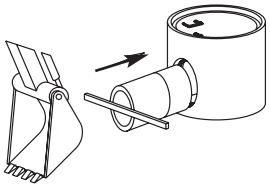
INSTALLATION INSTRUCTIONS



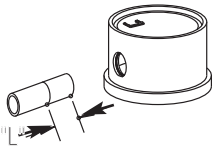
Large Bore Detail

STEP 1:
Confirm that the pipe surface is smooth, clean and free of foreign materials, chips, gouges and form seams due to manufacturing or handling. Slightly bevel any sharp or blunt edges caused by the cutting of the pipe.



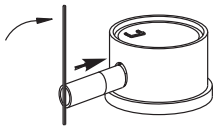
STEP 2:
Lubricate the connector and the entire section of the pipe that will be inserted into the connector. The chart below lists A-LOK's minimum lubrication length "L".

PIPE SIZE	MIN. LUBRICATION LENGTH "L"
4" - 15"	12"
16" - 18"	18"
21" & Larger	24"



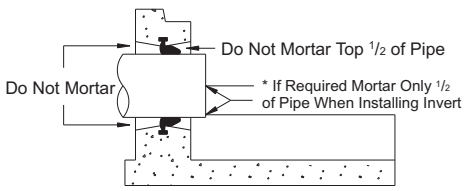
Small Bore Detail

STEP 3:
Center the pipe and connector square to each other and insert the pipe into the connector using a bar or back hoe depending on the size. Once the pipe is coupled with the connector, deflect the structure or pipe to achieve the proper angle.



WARNING
To ensure the A-LOK X-CEL Connector remains a flexible watertight connector, it is A-LOK Products, Inc. strong recommendation that no mortar be placed between the pipe and wall of the concrete structure. The use of mortar in this area would decrease the effectiveness of the connector to compensate for shear caused by settlement or ground movement.

NOTE:
To find approximate subgrade, measure from the outside base of the structure to the junction of the connector and flat spot. Then add the wall thickness of the pipe plus 1/4 inch.



CAUTION:
When installing pipe stubs for future pipeline installation, all stubs must be properly restrained to prevent any movement by means other than the A-LOK X-CEL Connector.

A•LOK® PRODUCTS, INC. The Company With Connections

DIMENSIONAL DATA SHEET

A•LOK® RING NUMBER	NOMINAL PIPE OD ±0.25"	RING DIAMETER A•LOK® I.D.	PIPE TYPES USE AS A GUIDE ONLY CHECK PIPE O.D. WITH MANUFACTURER
*140	4.25"	3.25"	4" PVC (SDR 35), (D 3034)
*150	4.50"	3.50"	4" PVC (SDR 21), (SDR 26), (SDR 40); 4" PVC (A-2000)
*160	4.75"	3.75"	4" PVC (SDR 25); 4" DI
*165	5.00"	4.00"	4" VC
*170	5.25"	4.25"	4" VC
185	5.75"	4.75"	5" PVC (SPECIAL)
*200	6.25"	5.25"	6" PVC (SDR 35), (SDR 41), (D 3034)
*210	6.50"	5.50"	6" PVC (SDR 21), (SDR 26), (SDR 40)
*225	6.875"	5.875"	6" DI; 6" PVC (A-2000); 6" PVC (SDR 25); 6" TRUSS
*235	7.25"	6.25"	6" VC
240	7.50"	6.50"	6" VC
255	7.82"	6.82"	6" VC
*285	8.50"	7.00"	8" PVC (SDR 35), (SDR 41), (SDR 26), (SDR 21), (SDR 40), (D 3034)
*300	9.00"	7.50"	8" DI; 8" PVC (SDR 25)
*310	9.25"	7.75"	8" TRUSS; 8" PVC (A-2000)
*320	9.50"	8.00"	8" VC; 8" TRUSS
325	9.75"	8.25"	8" VC
330	10.00"	8.50"	8" VC
340	10.25"	8.75"	8" RC
*350	10.50"	9.00"	10" PVC (SDR 35), (SDR 41), (SDR 21), (D 3034)
355	10.75"	9.25"	10" SPECIAL
*370	11.25"	9.75"	10" DI; 10" PVC (SDR 25)
380	11.50"	10.00"	10" PVC (A-2000)
*385	11.75"	10.25"	10" TRUSS
390	12.00"	10.50"	10" VC
400	12.25"	10.75"	10" VC
*410	12.50"	11.00"	12" PVC (SDR 35), (SDR 41), (SDR 21), (D 3034)
415	12.75"	11.25"	12" SPECIAL
*425	13.00"	11.50"	12" DI; 12" PVC (SDR 25)
440	13.25"	11.75"	12" A-2000
455	14.00"	12.50"	12" TRUSS
470	14.25"	12.75"	12" VC
475	14.375"	12.825"	12" VC
480	14.75"	13.25"	12" VC
490	15.25"	13.75"	14" DI; 15" PVC (SDR 35), (SDR 41), (D 3034)
500	15.50"	14.00"	15" SPECIAL
520	16.00"	14.50"	12" RC'B
525	16.25"	14.75"	12" SPECIAL

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*MOLDED GASKETS AVAILABLE

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540	16.625"	15.125"	12" SPECIAL
570	17.50"	16.00"	12" RC'C; 15" TRUSS; 16" DI
580	18.00"	16.50"	15" VC; 16" (PSCP) TYPE B; 18" STEEL
600	18.50"	17.00"	15" VC
610	18.75"	17.25"	18" TRUSS; 18" PVC (F679)
620	19.125"	17.625"	18" PVC (F794)
630	19.50"	18.00"	15" RC'B; 18" DI
640	20.00"	18.50"	15" RC; 20" STEEL
650	20.25"	18.75"	18" (PSCP) TYPE B
660	20.50"	19.50"	15" SPECIAL
675	21.00"	19.50"	15" RC'C; 18" VC
690	21.375"	19.875"	20" DI
700	21.437"	19.937"	18" VC
710	22.00"	20.50"	18" VC; 21" PVC (F679); 20" (PSCP)
720	22.50"	21.00"	21" PVC (F794)
740	23.00"	21.50"	18" RC'B
750	23.50"	22.00"	21" SPECIAL
770	24.00"	22.50"	24" STEEL
780	24.50"	23.00"	18" RC'C
800	24.75"	23.25"	24" PVC (F679)
805	25.00"	23.50"	18" RC (C+.25); 24" PVC
815	25.50"	24.00"	24" PVC (F794)
820	25.75"	24.25"	24" DI
840	26.00"	24.50"	21" VC
850	26.50"	25.00"	21" RC'B
855	26.75"	25.25"	24" A-2000
860	27.00"	25.50"	24" (PSCP) TYPE B
870	27.50"	26.00"	24" RC (SPECIAL)
890	28.00"	26.50"	21" RC'C; 27" PVC (F679)
900	28.25"	26.75"	21" RC (SPECIAL)
915	28.50"	27.00"	24" VC
920	28.75"	27.25"	27" PVC (F794)
930	29.00"	27.50"	24" VC
970	30.00"	28.00"	24" RC'B
980	30.50"	28.50"	24" SPECIAL
1000	30.75"	28.75"	24" RC (B +.375)
1020	31.25"	29.25"	30" PVC
1030	31.50"	29.50"	24" RC'C; 30" PVC (F679)

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1035	31.625"	29.625"	24" SPECIAL
1040	32.00"	30.00"	30" PVC (F794); 30" DI
1050	32.375"	30.375"	27" VC
1070	32.875"	30.875"	24" RC (C+.750)
1090	33.50"	31.50"	27" RC'B
1100	33.80"	31.75"	30" PVC (A-2000)
1110	34.25"	32.25"	27" RC (B+.375)
1130	35.00"	33.00"	27" RC'C
1140	35.25"	33.25"	27" RC; 33" PVC (F679)
1160	35.75"	33.75"	30" SP 5
1180	36.25"	34.25"	30" PE (HI-Q COLLAR)
1200	37.00"	35.00"	30" RC'B
1210	37.50"	35.50"	30" RC (B +.250)
1220	37.70"	35.70"	36" PVC
1230	38.00"	36.00"	30" RC (B +.50)
1235	38.375"	36.375"	36" PVC (F794)
1240	38.50"	36.50"	30" RC'C; 36" DI
1250	38.75"	36.75"	30" RC
1260	39.00"	37.00"	30" RC (C +.25); 36" PVC (F679)
1280	39.50"	37.50"	30" RC
1310	40.50"	38.50"	33" RC'B; 36" (PSCP) TYPE B
1320	40.75"	38.75"	36" (PSCP)
1330	41.125"	39.125"	36" SP
1350	42.00"	40.00"	33" RC'C
1360	42.25"	40.25"	33" RC +.25
1370	42.50"	40.50"	36" SP 5
1390	43.25"	41.25"	42" FIBERGLASS
1420	44.00"	42.00"	36" RC'B; 42" PVC
1430	44.50"	42.50"	42" DI
1470	45.50"	43.50"	36" RC'C
1475	45.75"	43.75"	36" NEPTUNE
1480	46.00"	44.00"	36" RC
1520	47.25"	45.25"	42" PSCP TYPE B
1530	47.50"	45.50"	SPECIAL PVC
1540	48.00"	46.00"	36" RC (SPECIAL)
1560	48.375"	46.375"	42" PE PIPE
1570	49.00"	47.00"	42" RC (SPECIAL)
1600	49.75"	47.75"	48" STEEL

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1625	50.50"	48.50"	48" PVC
1630	50.75"	48.75"	48" DI
1640	51.00"	49.00"	42" RC'B
1670	52.00"	50.00"	42" RC (SPECIAL)
1690	52.50"	50.50"	42" RC'C
1700	52.75"	50.75"	42" RC (SPECIAL)
1705	53.00"	51.00"	42" RC (SPECIAL)
1710	54.00"	52.00"	48" PSCP TYPE B
1745	54.50"	52.50"	48" SPECIAL
1790	56.00"	54.00"	42" RC (SPECIAL)
1820	56.875"	54.875"	54" DI
1830	57.00"	55.00"	54" FIBERGLASS
1840	57.50"	55.50"	54" DI
1850	57.75"	55.75"	48" SPECIAL
1860	58.00"	56.00"	48" RC'B
1910	59.50"	57.50"	48" RC'C
1920	60.00"	57.50"	48" RC (SPECIAL)
1930	61.50"	59.00"	60" DI
1940	62.00"	59.50"	54" PSCP
1970	63.00"	60.50"	60" FIBERGLASS; 60" PRESSURE PIPE
2040	65.00"	62.50"	54" RC'B
2070	66.00"	63.50"	63" FIBERGLASS
2080	66.50"	64.00"	54" RC'C
2140	67.00"	64.50"	64" RC (SPECIAL)
2300	72.00"	69.50"	60" RC'B
2360	73.50"	71.00"	60" RC'C
2430	75.50"	73.00"	72" FIBERGLASS
2520	79.00"	76.50"	66" RC'B
2560	80.50"	78.00"	66" RC'C
2750	86.25"	83.75"	72" RC'B +.25
2800	87.50"	85.00"	72" RC'C
2840	89.25"	86.75"	84" PE PIPE

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THE A-LOK GUARANTEE UNLIKE ANY OTHER

"Outstanding warranty and they live up to it too!"
John Higgins
Sherman Dixie

"We use it for the peace of mind that it has given us for the past 15 years."
Ron Dennison
Walden Greene Developers
Port Richey, FL

"If someone guarantees something they must be confident it works."
Bob Weller
Atlantic Precast

A-LOK® PRODUCTS, INC.
THE COMPANY WITH CONNECTIONS®
P.O. BOX 1647 • 697 MAIN STREET • TULLYTOWN, PA 19007

A-LOK PRODUCTS INC. guarantees the performance of the A-LOK pipe to manhole connector for the life of the structure.

The only mandatory requirements are:

- The connector is properly cast in the structure.
- The O.D. of the pipe is inserted through the I.D. of the connector.
- The connector is not torn.
- The O.D. of the pipe maintains a plus or minus tolerance within the nominal O.D. for which the connector is designed.

If these requirements are met and there is a leak between the pipe and connector, A-LOK PRODUCTS INC. will repair the leak around the pipe with a flexible, permanent repair.

A-LOK PRODUCTS INC. certifies, that the A-LOK Connector meets the physical and chemical requirements of ASTM C-923.

Your connection to engineered performance and reliability.

• A-LOK Compression Connectors • Z-LOK and G-3 Boot Connectors • STM Connectors • Tru-Contour Secondary Invert Systems • Duraplate 100 Corrosion Resistant Liner • Mandrels and Steel Knockout Equipment • Primary Invert Channeling • Spacelock Pyramid Spacers • Key-Lok Lift Bars and Lift Pin System

A-LOK® PRODUCTS, INC.
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