



INTERNAL JOINT SEAL

Technical Specifications

1. Scope

This specification describes the function of the NPC Internal Seal, its principle of operation, and the component materials that constitute the Internal Seal and their physical properties.

2. Product Application

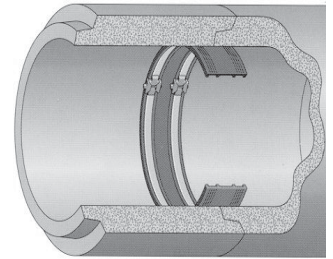
NPC Internal Joint Seals are designed to seal leaking pipe joints in most types of pipe including concrete, reinforced concrete, cast iron, ductile iron, steel, vitrified clay, PVC and HDPE. They are designed to withstand external head pressure of 34 feet (15 psi) and internal head pressure of 70 feet (30 psi).

3. Principle of Operation

NPC Internal Joint Seals stop leaking joints by bridging the joint with a flexible rubber seal and compressing the rubber seal against the inside diameter of the pipe on either side of the joint with the expansion bands.

The compressive force providing the seal on either side of the joint is the result of increasing the effective diameter of the stainless steel expansion bands. The diameters of the expansion bands are increased by tightening the bolts on the WedgeLock Assemblies. This forces the corresponding wedges, which are attached to the expansion bands, away from each other increasing the expansion band diameter. Depending on the diameter of the pipe joint being sealed, there will be between one and four WedgeLock Assemblies on each expansion band to ensure an even distribution of compressive force on the rubber seal.

Reference NPC Internal Seal Recommended Installation Procedure for a detailed explanation of the preparation, assembly and installation of the Internal Seal.



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4. Materials

NPC Internal Joint Seals consist of a rubber seal, 304 stainless steel expansion bands, and WedgeLock assemblies.

Flexible Rubber Seal - The rubber is made from an EPDM rubber compound. The rubber is extruded to the required length and the ends are hot spliced together using virgin rubber compound to form a high strength vulcanized joint. The physical properties of EPDM rubber are listed in the table below.

Physical Property	ASTM Specification	Test Requirement	Rubber Performance
Chemical Resistance 1 N Sulfuric Acid 1 N Hydrochloric Acid	D543, at 22°C for 48 hours	No Weight Loss No Weight Loss	No Weight Loss No Weight Loss
Tensile Strength	D412	1200 psi	1580 psi
Elongation at Break	N/A	350% minimum	500%
Hardness	D2240 (shore A durometer)	+/- 5% from manufacturer's specified hardness	48 +/- 5
Accelerated Aging	D573 70°C for 7 days	Maximum Decrease 15% tensile 20% elongation	10.1% tensile decrease 14.0% elongation decrease
Water Absorption	D471, immerse 0.75 by 2 inch specimen in distilled water at 70°C for 48 hours	10% weight increase maximum	0.8% weight increase
Ozone Resistance	D1149	Rating 0	Rating 0
Low Temp. Brittle Point	D746	No fracture at -40°C	No fracture at -40°C
Tear Resistance	D624, method B	200 lbf/in.	Greater than 210 lbf/in.

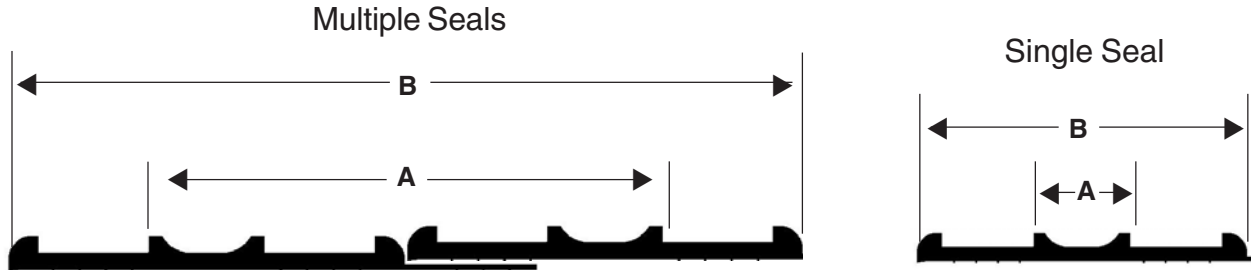
Stainless Steel Expansion Bands - The expansion bands are made from either 304 or 316 stainless steel. Physical properties are listed below.

Physical Property	304 Stainless Steel	316 Stainless Steel
Tensile Strength (min.)	75,000 psi	75,000 psi
Yield Strength (min.)	30,000 psi	25,000 psi
Elongation in 2 inches (min.)	40%	40%



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Maximum Sealing Area



Seal Size 7½	Seal Size 10½	Seal Size “A”	Seal Size “B”
1	0	2½	7½
0	1	5½	10½
2	0	10	15
1	1	13	18
3	0	17½	22½
2	1	20½	25½
4	0	25	30
3	1	28	33
5	0	32½	37½
4	1	35½	40½
6	0	40	45
5	1	43	48
7	0	47½	52½
6	1	50½	55½
8	0	55	60
7	1	58	63
9	0	62½	67½
8	1	65½	70½
10	0	70	75
9	1	73	78

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