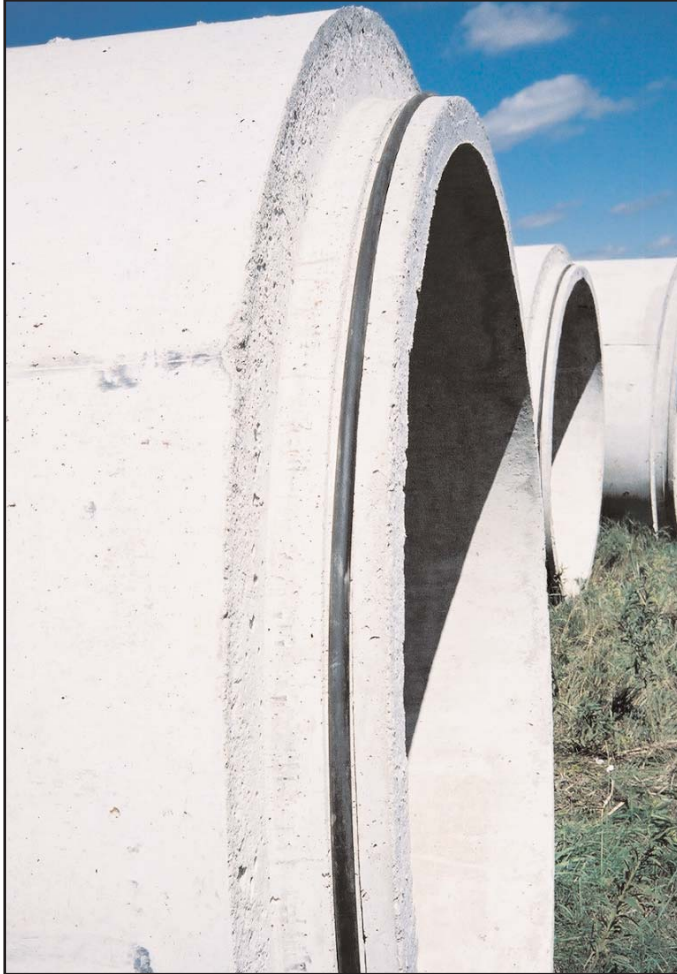




# CONCRETE PIPE and MANHOLE GASKETS



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# CONCRETE PIPE and MANHOLE GASKETS

## DESIGN REQUIREMENTS

### Design

Proper gasket design requires selection of materials, analysis of the joint configuration, and determination of the proper gasket profile.

### Materials

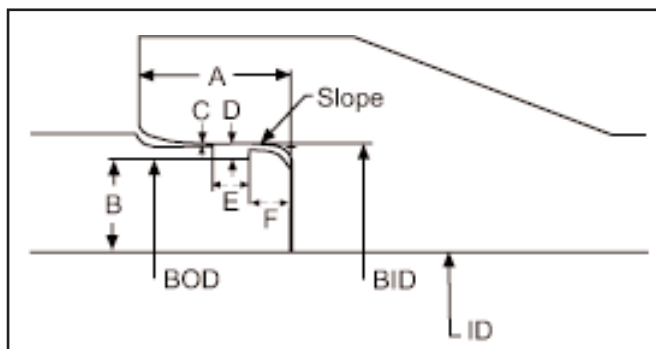
Several different rubber compounds are commonly used for concrete pipe gaskets. Selection of the appropriate compound depends on the physical properties and chemical resistance needed for the specific application. The following rubber compounds are standard materials for gasket extrusion. Special compounds are also available upon request.

- **Polyisoprene (IR)** - Properties are similar to those of natural rubber. Low cost; 1.0-3.5 ksi tensile strength; 300-750% elongation; (-)60-180°F temperature range; excellent compression set and rebound rating; excellent cracking, tear, abrasion, water, acid and impact resistance.
- **Neoprene (chloroprene) (CR)** - Very good ozone, cracking and sunlight resistance; 0.5-2.5 ksi tensile strength; 100-800% elongation; (-)80-300°F temperature range; excellent flame, abrasion, impact, oxidation and acid resistance; good water, petroleum and hydrocarbon oil resistance.
- **Nitrile (NBR)** - Excellent water, tear, abrasion, hydrocarbon oil and petroleum resistance; 1.0-2.5 ksi tensile strength; 400-650% elongation; (-)40-300°F temperature range; excellent compression set.
- **EPDM** (ethylene propylene diene monomer) - Excellent weather, sunlight, ozone, oxidation, water, acid, alkalis, esters, and abrasion resistance; 0.3-2.5 ksi tensile strength; 100-700% elongation; (-)75-400°F temperature range.

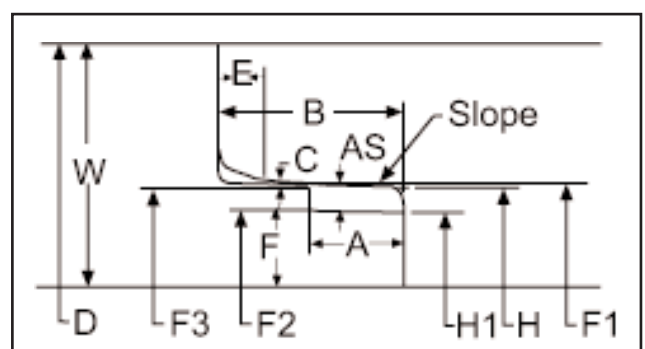
### Joint Configuration

Each gasket is designed specifically to fit the joint configuration provided by the pipe supplier. As a minimum, the following dimensional information must be supplied for joint evaluation and gasket design:

#### O-Ring Joint



#### Single Offset Joint



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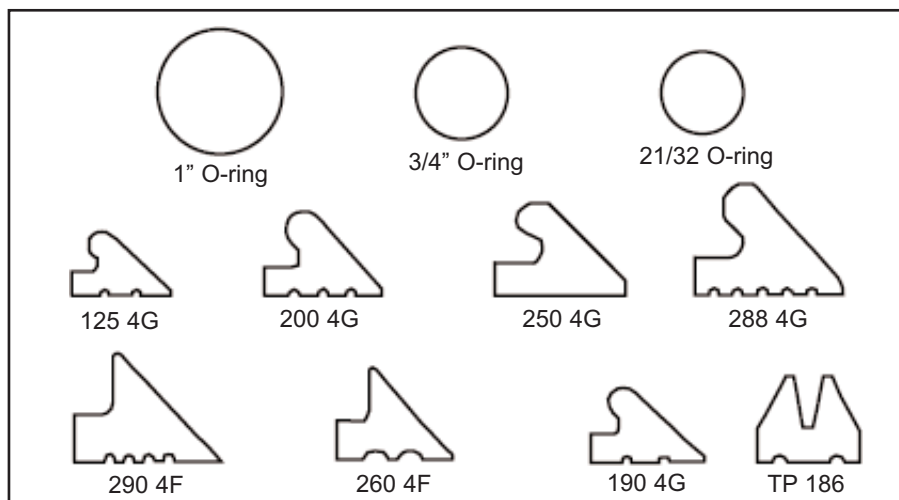
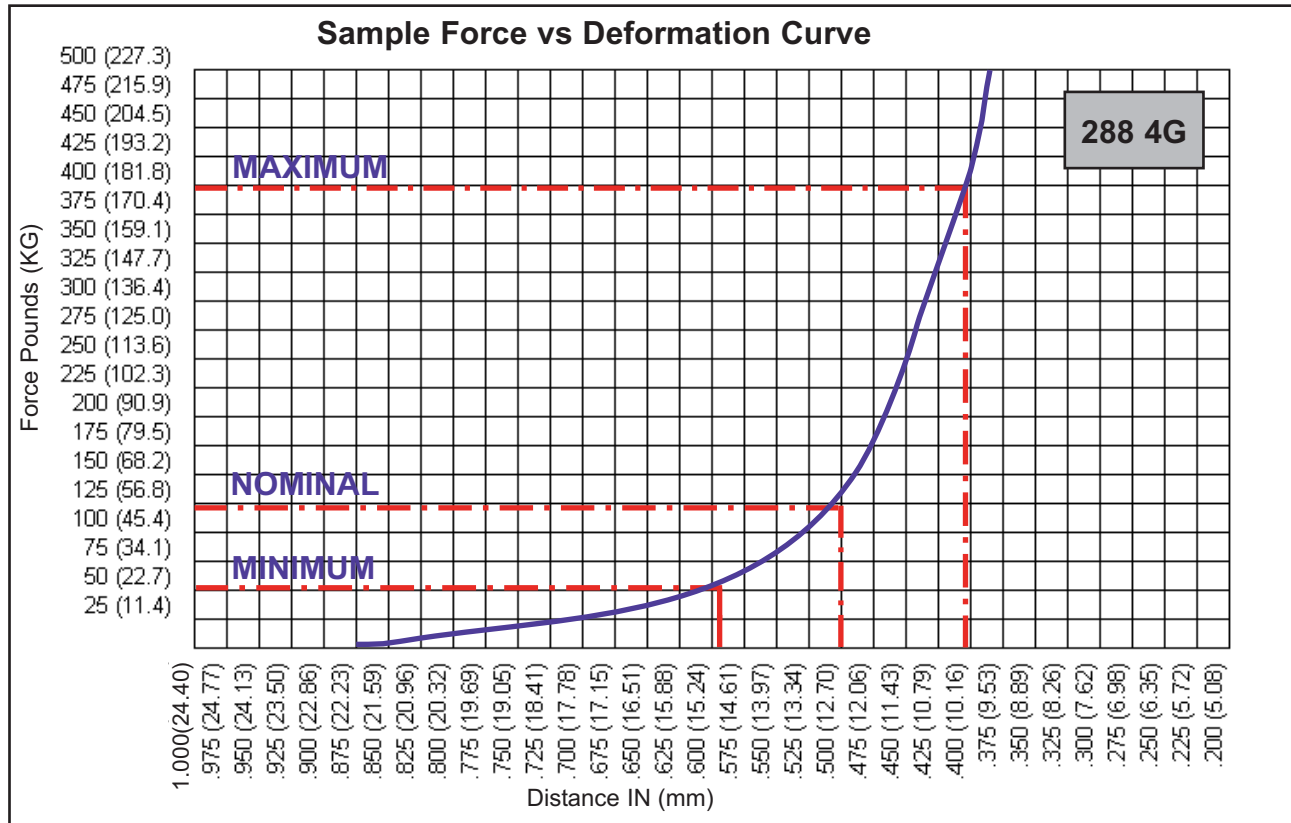




# CONCRETE PIPE and MANHOLE GASKETS

# DESIGN ANALYSIS

Each gasket profile is analyzed for its overall performance with regard to the specified joint configuration. This evaluation includes determination of the nominal, minimum and maximum joint opening and the respective deformations at these distances. Each gasket is then tested at our research laboratory and the resulting forces at these deformations provided as a force-deformation curve. These forces are evaluated for minimum sealing force and maximum bell force to prevent leaking or bell cracking.



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# CONCRETE PIPE and MANHOLE GASKETS

## SEALING PERFORMANCE

All profile gaskets for concrete pipe are designed to meet the physical requirements of ASTM C 443 - *Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets* and ASTM C 1619 - *Standard Specification for Elastomeric Seals for Joining Concrete Structures*. O-ring gaskets for concrete pipe meet the physical requirements of ASTM C 361- *Standard Specification for Reinforced Concrete Low-Head Pressure Pipe*. In addition to the physical property tests required for the rubber, each standard also includes optional plant hydrostatic testing to 13 psi for C 443 and C 1619 pipe and up to 120% of the internal working pressure for C 361 pipe.

Field testing is performed to the pressures indicated in the local project requirements. Testing is accomplished in accordance with the respective ASTM standards covering vacuum (negative air pressure), air or hydrostatic testing. As a minimum, all Press-Seal Gasket Corporation concrete pipe gaskets will meet or exceed field test pressures of 13 psi. Gaskets with ratings greater than 13 psi can be designed upon request.

## PHYSICAL PROPERTIES TESTING

Press-Seal Gasket Corporation maintains a full-time internal testing laboratory for evaluating compound materials and extruded cross-sections. As a minimum, each gasket is tested and certified to the following requirements:

<b>Physical Requirements for Elastomeric Seals for Concrete Pipe</b>		
<b>Tests</b>	<b>Limits</b>	<b>Units</b>
Tensile Strength, minimum	1200	psi
Elongation, minimum	350	%
Hardness, Type A durometer	30 to 70	durometer
Low-Temperature Hardness, max. increase	15	durometer
Compression Set, maximum	25	%
Ozone Resistance	no cracks	
Accelerated Aging:		
Tensile Strength, max. decrease	15	%
Elongation, max. decrease	20	%
Hardness, max. decrease	8	durometer
After Water Immersion:		
Volume, max. increase	5	%

Additional physical requirements for specialty compounds can be provided for review and approval.

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