

LMK TECHNOLOGIES

INSIGNIA[™]
HYDROPHILIC
SEALING SYSTEM

COMPREHENSIVE REPORT

Technical Data:

The Insignia™ product line comprising of O-Rings, Hydrophilic Connection Hat and End Seals are manufactured with a specific, formulated Hydrophilic Neoprene Compound.

| Characteristic | Unit | Value | Test Method |
|--|---------|------------|-------------|
| Tensile Strength | psi/Bar | 1177/81.15 | ASTM D2412 |
| Elongation at Break | % | 523 | ASTM D2412 |
| Specific Gravity | | 1.2 | ASTM D297 |
| Swell Capacity in Water (unrestrained) | % | 200 | GRCS |

Neoprene compound was designed for use in static seal underground applications. Water contact causes this compound to swell up to 200%. This forms a flexible and long-term compression seal. These hydrophilic expansion characteristics make this compound an excellent selection for sealing rough or smooth surfaces.

LMK Technologies has developed molded swelling gaskets for:

1. Mainline CIPP at Manhole Penetrations, known as Insignia™ End Seals
2. Main to Lateral Connection Seals, known as Insignia™ Hydrophilic Connection™ Hat
3. Lateral CIPP Linings, known as Insignia™ O-Rings

The sealing gasket systems are compatible with all pipe and CIPP pipelining materials.

Chemical Resistance:

The following results have been obtained through chemical resistance tests completed in accordance with ASTM Test Method D543.

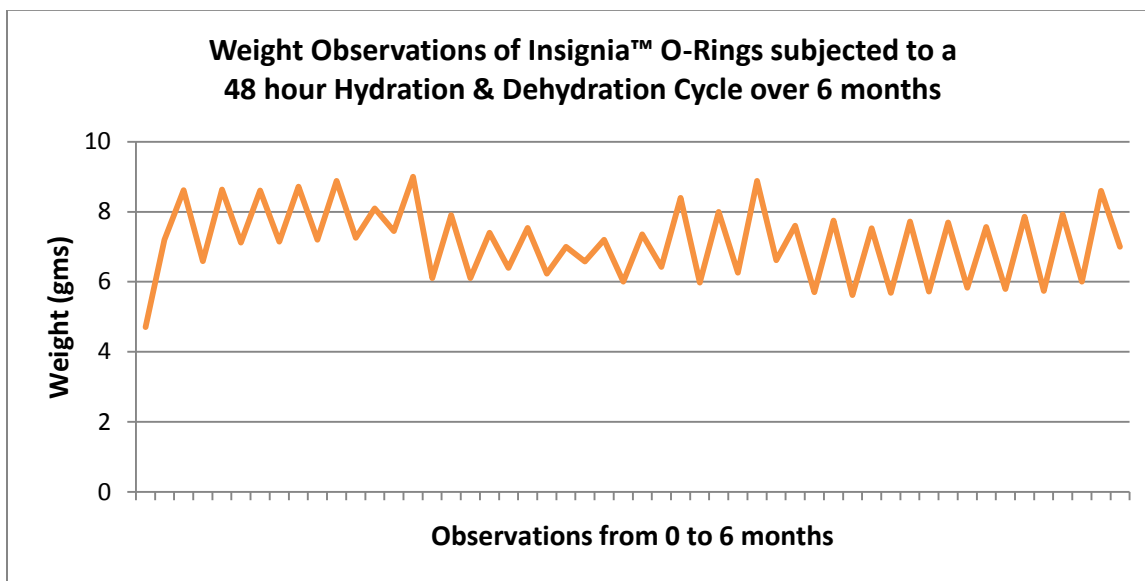
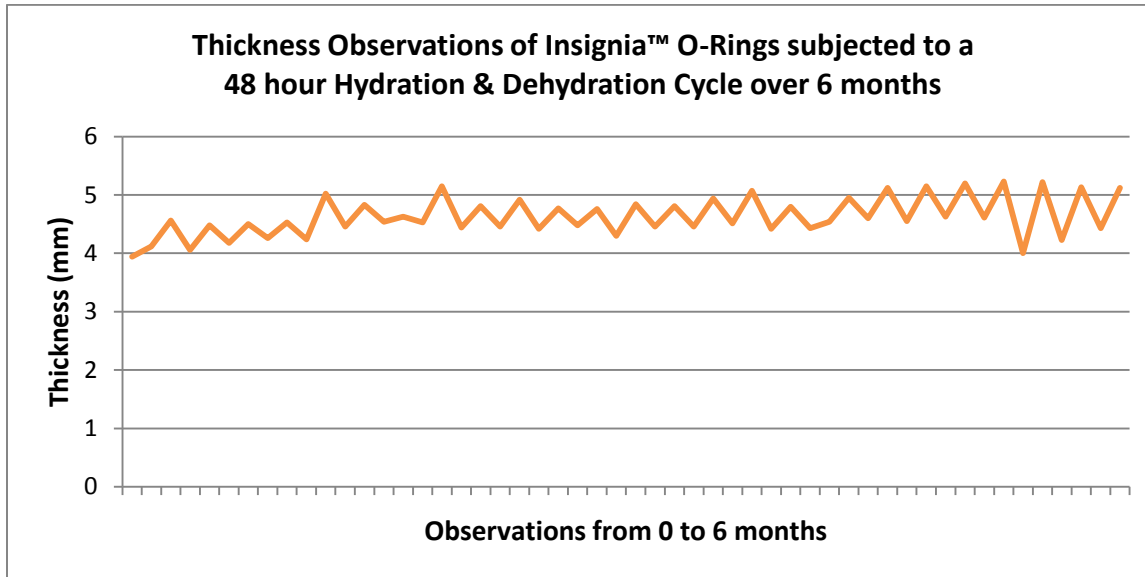
Legend:

- E = Excellent
- G = Good
- F = Fair
- N = Not recommended

Table:

| Product | Concentration (%) | Chemical Resistance |
|--------------------|-------------------|---------------------|
| Tap water (pH 6–9) | 100 | G |
| Nitric acid | 5 | N |
| Phosphoric acid | 10 | F |
| Sulfuric acid | 10 | F |
| Gasoline | 100 | N |
| Vegetable oil | 100 | F |
| Detergent | 0.1 | G |
| Soap | 0.1 | G |

Expansion Data:



Observations:

- There is no flaking or disintegration of material when the seals are subjected to alternate hydration/dehydration cycles.
- Based on the 48 hour duration of the Hydration & Dehydration cycles the seals exhibit thickness growth of anywhere between 15 to 55% and weight increase of anywhere between 36 to 250%.
- The Insignia™ Seals retain expansion even when they are dehydrated, with the seals demonstrating a dry to dry thickness increase of between 7 to 10% and dry to dry weight increase of 12 to 20%.
- It is important to note that the Insignia Seals take a minimum of 48 hours to demonstrate significant growth.