



PRODUCT BULLETIN

**Extreme Low Temperature
FKM Materials
9705/9905**

Precision Associates Inc. has two **FKM** materials that have proven to be a good fit for sealing in applications with exposure to frigid temperatures. These materials have outstanding low temperature flexibility and maintain long term sealing force.

9705 is a 70+/-5 duro black FKM.

9905 is a 90+/-5 duro black FKM (RGD resistant and Sour Service)



Low temperature performance can be a very important characteristic of an elastomeric compound. Reducing the temperature of the environment surrounding the rubber article will have a negative impact on the rubber properties. With decreasing temperatures, the movements of the molecular chains are reduced. At a certain temperature the molecular chains will no longer be able to move and the rubber loses all its rubber characteristics. The rubber will embrittle and become plastic like, reducing or eliminating the ability of the material to act as a seal.

There are several different ways to measure the low temperature properties of a rubber compound. The three most common methods used in the rubber industry are:

Glass Transition (Tg) is the temperature at which a particular rubber compound becomes crystalline and is stiff and brittle. At this point many molecules will be aligned and the compound will cease to be liquid or elastic. Time at a given temperature may also be required as some polymers need time to develop this crystallization. Testing is performed per ASTM E 1640.

Brittle Point is the temperature at which the material breaks upon impact. Testing is performed per ASTM D 1329.

Temperature Retraction is the temperature at which frozen rubber returns to an elastic state. Testing is performed per ASTM D2137.

Precision Associates typically tests seal compounds for Brittle Point and for Temperature Retraction, specifically TR-10. We can also provide other retraction results if desired. We consider the TR-10 test to be the best indicator for the performance of seals at low temperatures.

Compound No	Duro	Operating Temperature Range (°C)	TR-10	Applications/Properties
9705	70	-50° - +218°	-50°C	Extreme Low Temp
9905	90	-46° - +204°	-46°C	Extreme Low Temp, RGD Resistant, Sour Service

Note: high pressures tend to raise the temperature at which rubber compounds become crystalline. This needs to be considered when choosing materials for high pressure-low temperature applications. A generally accepted rule is that the Tg will rise by 1°C (1.8° F) for each 5.1 MPa (740 psi) of pressure applied.



3800 North Washington Ave.
Minneapolis, MN 55412-2142

Toll Free: 1-800-394-6590

612-333-7464

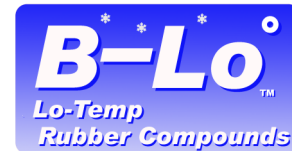
Sales: 612-334-9190

FAX: 612-342-2417

info@PrecisionAssoc.com

Ask us about all our molding capabilities:

- **Standard O-Rings**
- **Special Size O-Rings**
- **U-Cups**
- **V-Rings**
- **Rod Wipers**
- **X-Rings**
- **8-Rings™**
- **Multiseal® Low Friction Seals**
- **Kurv-Bak™ Hard Rubber Backup Rings**
- **Rubber Balls**
- **Medical Seals**
- **Custom Molded Seals & Components**



Precision Associates, Inc. is a leader in providing high-performance, consistent sealing solutions and precision-molded rubber products that exceed requirements in diverse industries.

- Over 1,000 different compounds
- More than 2,700 O-Ring Sizes
- On-Site Mold Shop
- R&D Lab
- Custom Molding
- 99% on-time delivery
- ISO 14644-1 Class 7 clean room

www.PrecisionAssoc.com