

## Extreme Heat

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### **EXTREME-HEAT™ 650 LONGER LIFE, HIGHER TEMPERATURE ELASTOMERS**

#### **Description**

EXTREME-HEAT™ 650 elastomers were developed by Kirkhill-TA to extend the service life and temperature range of aircraft elastomeric components such as clamps, seals, and hot air transport couplings. The elastomers process using traditional rubber part manufacturing techniques and can be made into nearly any product form including gaskets, o-rings, bellows, bulb seals, couplings, and electrical connector seals.

EXTREME-HEAT™ 650 withstands temperature excursions to 1000°F and is suitable for sustained service in the 550°F to 650°F range. At temperatures above 400°F, the elastomers have life expectancy that depend on how they are used in an application. Long-term compression set and deterioration of mechanical properties at high temperatures can often be counteracted with fiberglass or metal reinforcements.

#### **Benefits**

Versus other high temperature elastomers:

- ▶ Lower component life cycle costs due to greatly increased component life at elevated temperatures
- ▶ Improved component performance and reliability due to improved retention of physical properties at elevated temperatures

Versus metal:

- ▶ Reduced cost and weight due to selective replacement of metal components
- ▶ Not prone to ultrasonic fatigue as are certain metal components

#### **Uses**

EXTREME-HEAT™ 650 elastomers have been successfully used in a wide range of applications including jet engine nozzle fairing seals, thermal shields, anti-icing and ECS system seals, exhaust duct seals, and nacelle seals.

## Typical Properties

Property	EXTREME-HEAT 650 Unreinforced	EXTREME-HEAT 650 with Fiberglass Fabric Reinforcement
Hardness (Durometer A per ASTM D2240)	35 to 70 depending on compound	55-90 depending on fiber volume
Tensile Strength (psi per ASTM D412)	700-800	2000-2100
Elongation (Percent per ASTM D412)	300-400	30-40
Tear Strength (ppi per ASTM D624, Die B with grain)	60-70	300-600
Specific Gravity (ASTM D297 or D792)	1.12-1.22	1.18-1.44
Compression Set (Percent of Original Deflection per ASTM D395, Method B, 70 hrs. at 302°F)	3.5-6.0	not available
Compression Set (Percent of Original Deflection per ASTM D395, Method B, 24 hrs. at 500°F)	72.0-76.0	not available

## Thermal Performance (Percent Elongation per ASTM D412 after Dry Heat Aging per ASTM D573)

Time (hours)	EXTREME-HEAT 650 Unreinforced					EXTREME-HEAT 650 with Fiberglass Fabric Reinforcement				
	500°F	550°F	600°F	650°F	700°F	500°F	550°F	600°F	650°F	700°F
0	368	368	368	368	368	*	*	*	35	*
24	*	*	*	*	57	*	*	*	*	*
65	*	*	*	192	*	*	*	*	*	*
120	*	*	*	80	*	*	*	*	*	*
168	*	*	216	28	*	*	*	*	17	*
336	*	*	*	*	*	*	*	*	21	*
600	*	*	148	*	*	*	*	*	20	*
1000	226	140	94	*	*	*	*	*	32	*
2000	174	41	*	*	*	*	*	*	*	*
2604	*	9	*	*	*	*	*	*	*	*
3000	125	*	*	*	*	*	*	*	*	*
4000	100	*	*	*	*	*	*	*	*	*
4500	93	*	*	*	*	*	*	*	*	*
5000	80	*	*	*	*	*	*	*	*	*
6000	69	*	*	*	*	*	*	*	*	*

\* Performance data not Available

## Fluid Resistance

	Skydrol LD4 (24 hours immersion at 75°F per ASTM D471)	Jet Fuel (5 minutes immersion in ASTM Reference Fuel B at 75°F plus 10 wetting/drying cycles in air at 300°F for 2 hours per ASTM D471)	Lubricating Oil (5 minutes immersion in MIL-L-7808 at 75°F plus 10 wetting/drying cycles in air at 300°F for 2 hours per ASTM D471)
Hardness Change (Durometer A per ASTM D2240)	-10	-3	-5
Volume Change (Percent per ASTM D471)	+14.5	+4	+4.5