

MARKEZ® Z1400 UHT PERFLUOROELASTOMER

TECHNICAL DATASHEET

EXTREME HIGH TEMPERATURE BLACK PERFLUOROELASTOMER

Z1400 is one of the most thermally resilient FFKM compound currently available on the market. Markez Z1400 exhibits a combination of fantastic chemical resistance, extremely low compression set over time, and a best in class high heat resistance of 335 °C (635°F). Used as a cost-effective alternative to K7075 in countless applications across various industries like Semiconductor, Petro-Chem, Paint and Ink applications where resistance to harsh solvents is required. Available in O-rings and custom shapes. Our experienced application engineers welcome the opportunity to assist you in selecting the compound that provides the best value for your application.

FEATURES AND BENEFITS

- Cost effective
- Nearly universal chemical compatibility
- Extremely low compression set
- Compatible with amines < 100°F
- Does not melt at 350°C (under an air environment)
- Good dynamic properties - Long service life

APPLICATION EXAMPLES

- Chemical sprayers, injectors and reactors
- Connectors, Controls & Filters
- Petro-Chem equipment, Sour gas
- Ink handling & spraying equipment
- Inorganic & Organic Acids & Alkine
- Ketones, Esters, Ethers, Aldehydes
- Solvents
 - Acetone, Heptane
 - Glycol ethers, Naphtha
 - Toluene, Turpentine
 - White spirit, Xylene
 - Methyl ethyl ketone (MEK)
 - Dimethylformamide (DMF)
- Lab Instrumentation
- Liquid chromatography equipment
- Mechanical seals
- Painting equipment
- Pumps & Valves
- Aerospace Fuels, Skydrol & Oils
- Semiconductor Applications
 - Dry etch
 - Strip
 - LPCVD
 - Litho/Track
 - ECP
 - Exhaust valves

TYPICAL PHYSICAL PROPERTIES

PROPERTIES	ASTM	TYPICAL VALUE
Color		Black
Material Type	FFKM	FFKM
Hardness, Shore A	D2240	74
Tensile Strength, MPa (psi)	D412	18.91 (2,742)
Elongation at Break, %	D412	218
Min Operating Temp (lower spikes)		-15 °C (5°F)
Max Operating Temp (higher spikes)		335 °C (635°F)
Low Temperature (TR10), °C		-2



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Markez® is a Registered Trade name of Marco Sealing

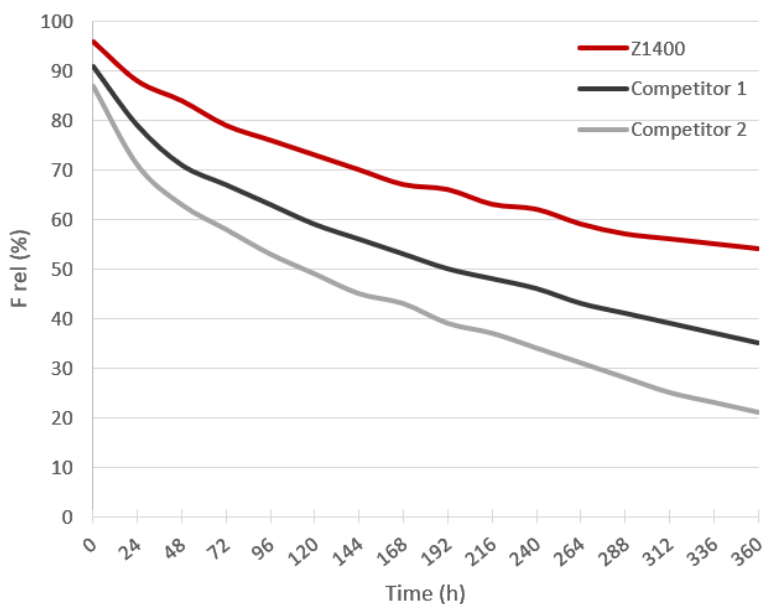
TESTING RESULTS OF MARKEZ® Z1400 UNDER VARIOUS CONDITIONS

COMPRESSION STRESS RELAXATION

Z1400 is one of the most thermally resilient FFKM compounds currently available on the market. With a low compression set and enhanced extreme temperature sealing force retention, Markez Z1400 outperforms the competition.

When tested for 360 hrs at 300°C against a group of FFKM competitors, Z1400 holds over 50% of its original sealing force. Because of its first-rate compression stress relaxation resistance and thermal stability, Z1400 offers fantastic long term, high temperature sealing.

Compression Stress Relaxation at 300°C



COMPRESSION SET – Various Conditions	Typical Test Results
Compression Set: 70 hrs. @ 200°C (392 °F)	6.5%
Compression Set: 70 hrs. @ 275°C (527 °F)	9.1%
Compression Set: 70 hrs. @ 300°C (572 °F)	18%
Compression Set: 70 hrs. @ 325°C (617 °F)	36.1%
Compression Set: 1000 hrs. @ 250°C (482 °F)	21%

HEAT AGING – (70 hrs. @ 290°C)	Typical Test Results
Hardness Change, Shore A	-3
Tensile Strength Change, %	-12
Ultimate Elongation Change, %	-1
Weight Loss, %	-0.3

HEAT AGING – (72 hrs. @ 300°C)	Typical Test Results
Hardness Change, Shore A	-5
Weight Loss, %	-0.9

HEAT AGING – (72 hrs. @ 335°C)	Typical Test Results
Hardness Change, Shore A	-10
Weight Loss, %	-3.7

GAS PERMEATION – T = 30°C	Typical Test Results
Nitrogen, cm ³ (stp)*mm/m ² *atm*d	250
Oxygen, cm ³ (stp)*mm/m ² *atm*d	450
Helium, cm ³ (stp)*mm/m ² *atm*d	5,400

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Electric Properties – Dielectric constant and loss factor at 50Hz. Resistivity 100 V direct tension.	Typical Test Results
Dielectric Constant ϵ'	3.50
Loss Factor $\tan(\delta)$	0.030
Surface Resistivity R_s, Ω	5 E16
Volume Resistivity $R_v, \Omega \cdot \text{cm}$	6.1 E16

STICTION TO AL	Typical Test Results
Max Force, N	314
Energy, N*mm	349

THERMAL EXPANSION	Typical Test Results
Longitudinal, $10^{-6} 1/K$	317
Transversal, $10^{-6} 1/K$	332
α_T/α_L	0.95

NITRIC ACID 65% – (168 hrs. @ 80°C)	Typical Test Results
Change in Tensile Strength, %	-61
Change in Elongation, %	34
Change in Volume, %	2.8

ETHYLENE DIAMINE – (336 hrs. @ 60°C)	Typical Test Results
Change in Tensile Strength, %	30
Change in Elongation, %	25
Change in Volume, %	3.0

Ammonia 30% – (168 hrs. @ 100°C)	Typical Test Results
Change in Tensile Strength, %	-5
Change in Elongation, %	10
Change in Volume, %	2.0

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