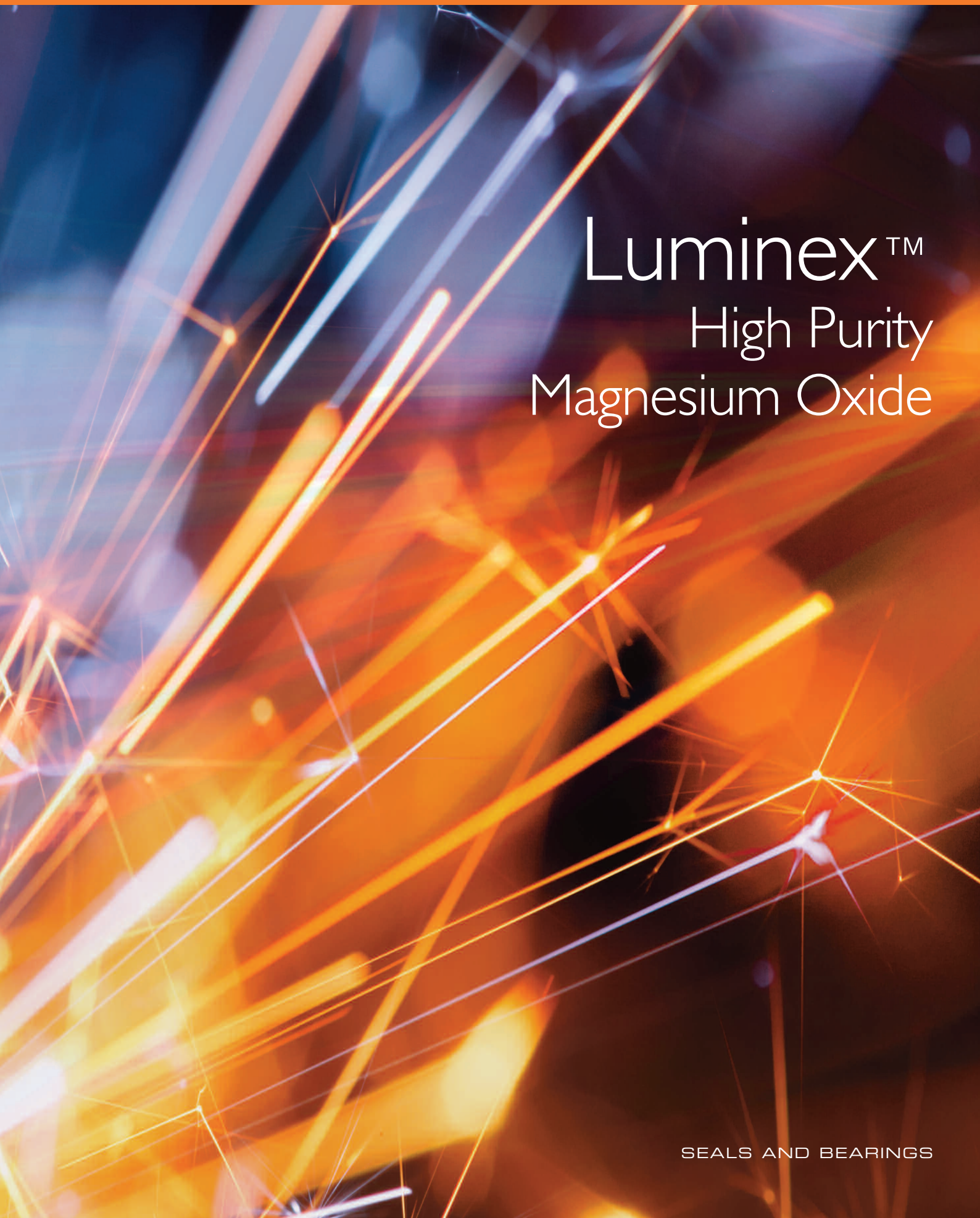
Morgan Advanced Materials



Luminex™
High Purity Magnesium Oxide

SEALS AND BEARINGS

Ceramic material with excellent electrical insulating properties and high thermal conductivity.

All of Morgan's Luminex products are excellent electrical insulators and thermal conductors. The simple crystal structure allows it to flow during swaging and drawing, reaching near theoretical density yet allowing compacting to occur down to very small sizes without damaging conductors. Its non-toxic nature means it is renewable in nature, safe to handle and ultimately safe to dispose of.

Typical applications

Mineral Insulated Thermocouple

- Metal heat treating
- Nuclear reactors
- Oil wells industrial thermal processes

Industrial Heating

- Down hole heating cables
- Medium voltage heaters
- Cartridge heaters

Main Luminex material range

Morgan Advanced Materials offers three differentiated grades of magnesium oxide material. We also offer free form magnesium oxide powder, please contact the team for more information.

Luminex™ 970

- ASTM E1652 Type (2) MgO compliant.
- 99% Magnesia (typically 99.3%).
- Applications include cartridge heaters and fire insulating cables.

Luminex™ 993

- ASTM E1652 Type (1) MgO compliant.
- 99.4% Magnesia (typically 99.6%) and characterised by low boron, cadmium and iron levels.
- Used in the manufacture of ASTM E585 compliant thermocouples for Aerospace and heat treating applications. Also used for cartridge heaters & medium voltage heating systems.

Luminex™ 998

- ASTM E1652 Type (1P) MgO compliant.
- 99.4% Magnesia (typically 99.6%). with low SiO_2 content.
- Used in the manufacture of ASTM E235 compliant thermocouples for Nuclear industry and also for ASTM E2181 compliant thermocouples for nobal metal applications.

About us...

Morgan Advanced Materials specialise in the production of a high purity MgO material with a controlled chemistry giving high consistency from batch to batch. This offers repeatability and reliability in the most demanding of applications.

With 30 years experience in the production of this material, leverage Morgan's expertise for your application today.

Properties

- High thermal conductivity - operating up to 1500°C.
- Tailorable properties include strength, porosity and density.
- Compactable.

Physical Characteristics and Chemistry

Chemical Analysis by Mass				
Chemical Analysis (Specified)	Units	Luminex 970	Luminex 993	Luminex 998
MgO	%	99.0 min.	99.40 min.	99.40 min.
CaO	%	0.40 max.	0.35 max.	0.35 max.
SiO_2	%	0.50 max.	0.35 max.	0.13 max.
Al_2O_3	%	0.15 max.	0.15 max.	0.15 max.
Fe_2O_3	%	0.05 max.	0.04 max.	0.04 max.
B+Cd	ppm	<10	<20	<20
S	ppm	<10	<10	<10

Chemical Analysis (Typical)	Units	Luminex 970	Luminex 993	Luminex 998
MgO	%	99.30	99.57	99.68
CaO	%	0.32	0.22	0.16
SiO_2	%	0.33	0.18	0.12
Al_2O_3	%	<0.05	<0.05	<0.05
Fe_2O_3	%	0.04	0.036	0.037
B+Cd	ppm	<10	<10	<10

Mechanical Properties	Units	Luminex 970	Luminex 993	Luminex 998
Apparent Porosity	Vol %	24 to 38	28 to 38	28 to 38
Bulk Density	gcm^{-3}	2.20 to 2.70	2.20 to 2.49	2.20 to 2.49
Flexural Strength	MPa	7 to 85	7 to 71	7 to 71
Compressive Strength	MPa	12 to 210	12 to 170	12 to 170

Thermal Properties (Typical)	Units	Luminex 970	Luminex 993	Luminex 998
Thermal Expansion 200 - 500°C	$10^{-6}K^{-1}$	13.0	11.7	11.7
Thermal Expansion 20 - 1000°C	$10^{-6}K^{-1}$	13.9	13.0	13.0

Electrical Properties (Typical)	Units	Luminex 970	Luminex 993	Luminex 998
Volume Resistance @ 600°C	Ωcm	1.3E +10	3.0E +10	1.0E +10
Volume Resistance @ 700°C	Ωcm	8.4E +08	1.9E +09	6.5E +08
Volume Resistance @ 800°C	Ωcm	9.3E +07	2.1E +08	7.2E +07
Volume Resistance @ 900°C	Ωcm	1.5E +07	3.2E +07	1.2E +07
Volume Resistance @ 1000°C	Ωcm	3.2E +06	6.8E +06	2.5E +06

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At Morgan Advanced Materials, our purpose is to use advanced materials to help make more efficient use of the world's resources and to improve the quality of life.

Morgan's highly experienced scientists and application engineers actively engage with our customers to find new solutions for complex and technologically demanding problems.

We are building distinctive competencies in:

- Leading technology and materials science capability and process know-how
- Application engineering
- Customer focus, reputation for quality and delivery and brand

Our core strength is our ability to get to grips with individual customer problems, apply the science and engineer elegant and reliable solutions.

For all enquiries, please contact our specialist sales and marketing offices:

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