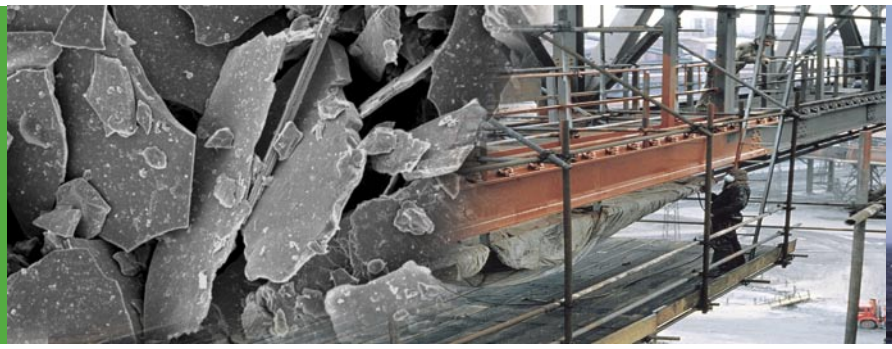
KÄRNTNER
MONTANINDUSTRIE
INDUSTRIAL MINERALS

MIOX®



MIOX® AS, SG, DB

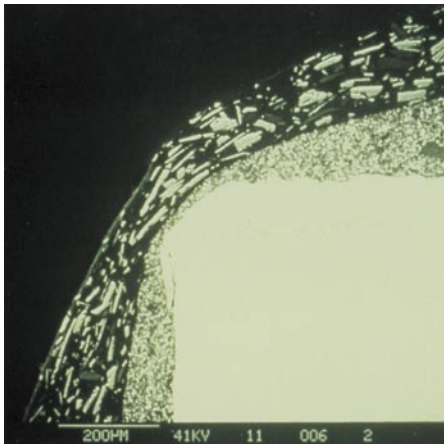
MIOX® Products

Micaceous iron oxide coatings have been known for their unique protective effect for almost a century. A MIOX®-based protection system ensures long-term corrosion protection, thereby extending maintenance-free intervals and reducing costs.

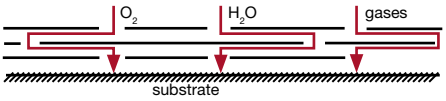
Product Benefits

Upon application a corrosion protection paint with MIOX® pigments forms a coating with a metallic sheen. During the curing process the extremely thin lamellar pigment particles in the coating settle almost parallel to the surface, overlapping with each other as they do so. This network of overlapping flakes, rather similar to fish scales or roof tiles, forms a tough barrier against pollutants such as salty fog, sulphur dioxide, ammonium salts or other atmospheric pollutants. Penetration by moisture and oxygen is also effectively prevented.

Scanning electron microscope photograph of a cross-section of MIOX® paint film clearly showing the orientation of the particles parallel to the steel surface (magnification x 440).

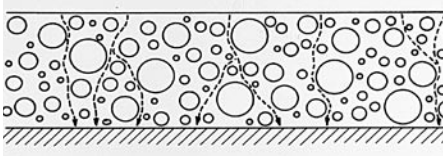


1. Barrier Effect

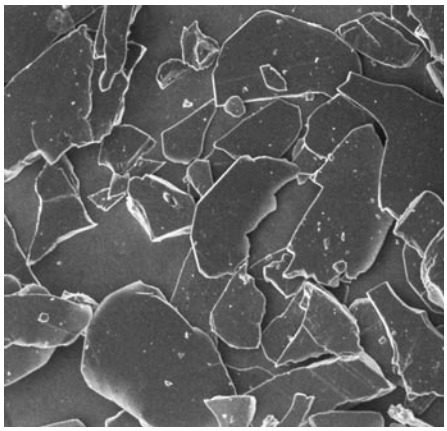


The illustration shows how the parallel orientation of the platelets in MIOX® prevents rapid penetration by water and environmental pollutants.

Normal pigments allow environmental pollutants to get through to the steel structure much faster. There is no barrier effect whatsoever.



A scanning electron microscope photograph of a MIOX® acrylic rubber coating after 10 years of exposure to the elements clearly shows how the MIOX® particles near the surface protect the binder underneath.



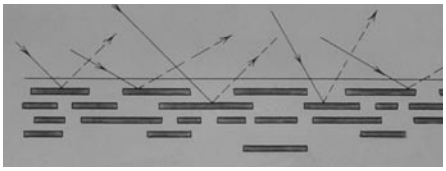
Fields of Application

- ▲ Heavy-duty corrosion protection bridges, offshore drilling platforms, tanks, building construction, industrial plants, etc.
- ▲ Decorative metal protection garden doors and fences, signboards, etc.
- ▲ Plastics-,ceramics-, paint and varnish industry

General characteristics of MIOX®-micaceous iron oxide:

- ▲ lamellar structure
- ▲ high specific gravity and therefore absolute orientation to the substrate of the micaceous iron oxide particle
- ▲ barrier effect
- ▲ UV and IR radiation reflection instead of absorption
- ▲ paint film reinforcement
- ▲ high decorative value

2. Shield Effect

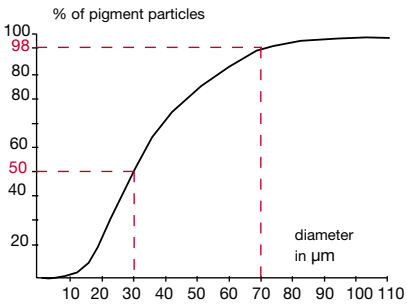


The MIOX® particles near the coating surface reflect IR and UV radiation and therefore protect binders from early degradation.

3. Paint Film Reinforcement

Dispersant evaporation, continual exposure to moisture and drying as well as mechanical stress and different temperatures exert a severe strain on the coating. The incorporation of the MIOX® platelets in the paint film improves its mechanical properties and prevents the protective coating from being destroyed.

4. Particle Size Distribution



Particle size distribution of the lamellar flakes in a representative MIOX® test sample.

The lamellar particles in the representative test sample amount to approximately 70-80 %, with a platelet thickness of some 2-4 µm. The larger platelets are mainly responsible for the shield effect of the MIOX®. The non-lamellar particles mainly comprise micro-particles of up to 5 µm. In conjunction with the lamellar particles a very high packing density is obtained in the paint film.

5. Adhesion Improvement

Incorporation of MIOX® pigments improves adhesion between a paint film and the substrate as well as between subsequent coats. This has proved particularly true of applications on galvanized surfaces.

Many countries are already using MIOX®-pigmented paints for high-build coating systems which are applied in single layers. These coating systems are principally used for high-voltage electricity pylons and other galvanized masts.

The adhesion-promoting qualities of MIOX® are increasingly being used to improve the performance of epoxy-based protective systems. The incorporation of MIOX® allows problem-free recoating as the need for special surface preparation is eliminated.

6. Abrasion Resistance

The transport of steel structures to the construction site creates a need for extremely abrasion-resistant “travel coats” which will withstand the rigours of handling, storage, transporting and erection on site.
MIOX® with its toughness and abrasion resistance is an ideal pigment for such travel coats.

7. Chalking Reduction

High levels of UV radiation cause “chalking”. During this process particles near the surface progressively become detached, resulting in erosion of the coating. Some media are more susceptible to UV attack than others and probably the most vulnerable are epoxies. Pigmentation with MIOX® solves this problem because of the shielding action of the plate-like particles.

Product Overview / Technical Details

Product	MIOX® AS	MIOX® SG	MIOX® DB
Colour	grey with metallic sheen	grey with metallic sheen	grey with metallic sheen
Particle shape	lamellar	lamellar	lamellar
Grade (ISO 10601)	1	1	1
Type (ISO 10601)	1	2	3
Iron content (Fe_2O_3 as per ISO 1248)	> 85 %	> 85 %	> 85 %
Density g/m³ (ISO 787/10)	4,8	4,8	4,8
Bulk density g/cm³ (DIN 53466)	approx. 1,4	approx. 1,4	approx. 1,6
Loss on ignition (800° C)	< 1 %	< 1 %	< 1 %
pH-value (ISO 787/9)	9	9	9
Oil absorption g/100 g (ISO 787/5)	19	18	16
Residue on sieve 100 µm (EN ISO 4610)	traces	traces	traces
Residue on sieve 63 µm (EN ISO 4610)	max. 5 %	5-15 %	25-35 %

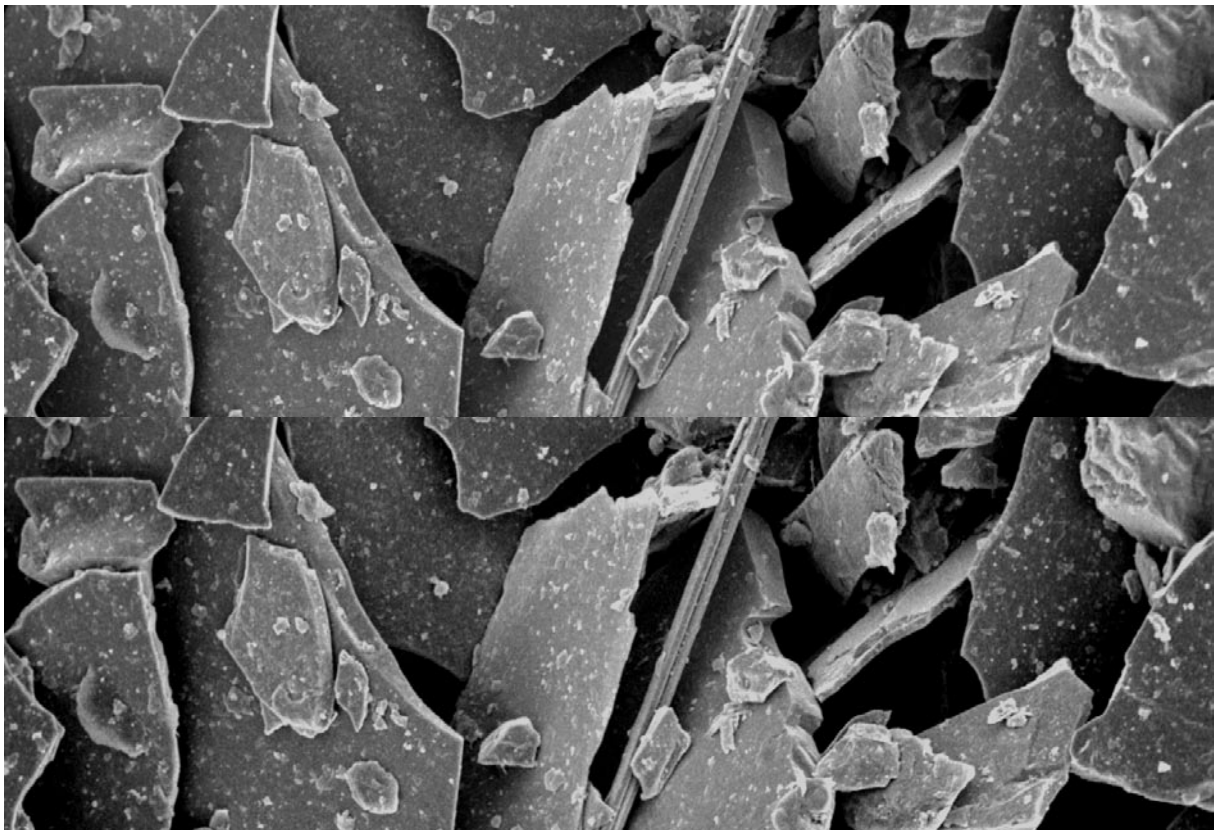
The values provided in our data sheets and publications are based on elaborate research. However, they do not represent specifications, they are just average values without any legally binding effect.

Eiffel Tower in Paris/France

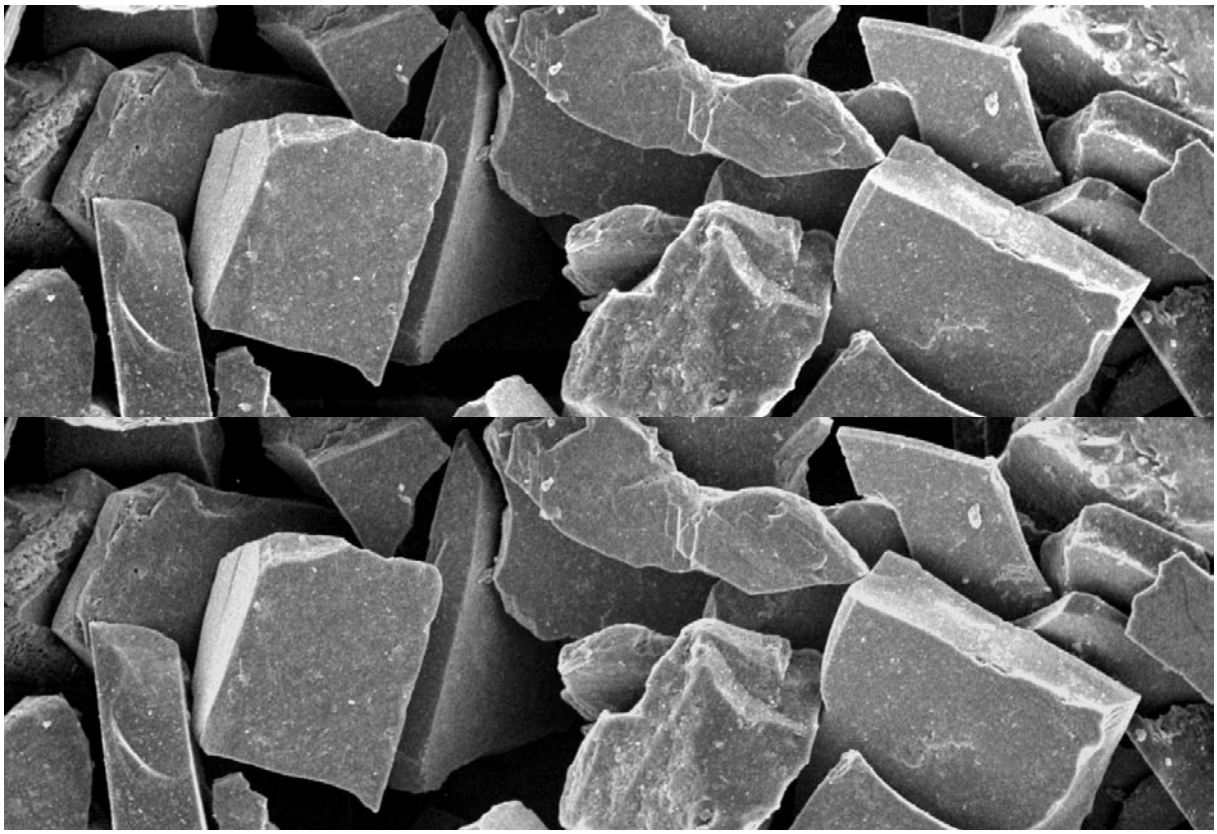
Railway bridge in the Kamptal/Austria

Brake linings

MIOX® SG in comparison with competitive products



MIOX® SG
Electron micrograph of MIOX® SG with predominantly lamellar platelet structure (magnified by 1000)



Competitive product
Electron micrograph of a competitive product with predominantly cubic structure (magnified by 1000)

For a three-dimensional view of these electron micrographs spread the folder flat in front of you on an even, horizontal surface. Look at just one pair of pictures in front of you and cover the other one with a sheet of white paper. Look at the pictures from a distance of ca. 50 cm with prismatic glasses. By moving the prismatic glasses try to position the two grey centre points at the right-hand edge of the picture on top of one another. Now focus your eyes on the middle picture and after a few moments you can enjoy the three-dimensional world of Micaceous Iron Oxide.

Some of Kärntner Montanindustrie representatives:

USA
Kraft Chemical Company
Mr. Richard Kraft
1975 N. Hawthorne Ave.
Melrose Park IL 60160
Chicago, USA
Tel. +1 708 345 5200
Fax +1 708 345 0761
rkraft@kraftchemical.com

Canada
Horizon Chemicals Ltd.
Mr. Ottwin Schmidt
1597 Derwent Way
Delta, B.C. V3M 6K8
Canada
Tel. +1 604 777 5018
Fax +1 604 777 7085
vernon@horizonchemicals.ca

England
Cephas Limited
Mr. John Severn
46 Nuthurst Drive
Churchbridge, Cannock
WS11 8SZ Staffordshire, UK
Tel. +44 (0)1922 41 43 91
Fax +44 (0)1922 41 94 56
jsevern@btinternet.com

Poland
Keyser & Mackay Polska Sp.z.o.o.
Mr. Krzysztof Sobol
ul. Zeromskiego 52
PL-90-626 Lodz
Tel. +48 42 6349320
Fax +48 42 6349325
krzysztof.sobol@keymac.com

Turkey
Prosim Kimya San. ve Tic. Ltd. Sti.
Mr. Semih Iscimenler
Kucuk Bebek Cad.
Huzur Apt. Arkasi 16-1, Bahce Villa no:7
TR-Bebek 34342 Istanbul
Tel. +90 212 263 78 21
Fax +90 212 263 78 25
semih.iscimenler@prosim.com.tr

Japan
Kikuchi Color & Chemicals Corporation
Mr. Takaaki Moriyama
Ukima 5-3-33, Kita-Ku
Tokyo 115-0051 Japan
Tel. +81 (0)3 5916 2881
Fax +81 (0)3 3965 8156
moriyama_takaaki@kikuchicolor.co.jp

China
Guangzhou Win Zone Trading Co., Ltd.
Mr. Jacky Wong
Rm.1709, Guangdong Navigation Building,
48 Baqier Rd., Guangzhou, China
Tel. +8620 8329 5518
Fax +8620 8329 5525
winzone_gzb@21cn.net

Singapore
Perfect Chemical Trading Pte Ltd.
Mr. Andy Chong
20 Penjuru Lane #05-05
Singapore 609193
Tel. +65 686 14848
Fax +65 686 11480
perfectchem@pacific.net.sg

Representatives in other countries can be found at www.kmi.at

Kärntner Montanindustrie
Gesellschaft m.b.H
Postfach 4, Schloss 1
A-9400 Wolfsberg

Marketing
Tel. +43(0)4352 54 5 35-37
Fax +43(0)4352 54 5 35-35
miox.technik@kmi.at

Sales
Tel. +43(0)4352 54 5 35-36
Fax +43(0)4352 54 5 35-35
miox@kmi.at

www.kmi.at