

NEW

# MARTOXID KMS

Take advantage of Martinswerk's Feedstock 'Ready to Press'



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**martinswerk**

**ALBEMARLE®**

## MARTOXID® KMS

# Newly Developed Fully Processed Ceramic Feedstocks, “Ready To Press”

In our quest to keep getting better, Martinswerk has succeeded in the development of a new generation of granulates to meet the specialized needs for ceramics, and in particular for uniaxial and isostatic pressing. Using our many years of experience spent fine-tuning our applications expertise, we have designed a wide range of ceramic bodies “ready to press” with an Al<sub>2</sub>O<sub>3</sub> content of 92 to 99.7%. Covering various application fields, our new KMS products are tailor made for producing engineered ceramics, electronic components, ballistic parts, anti-wear components, and other products for specific applications.

A consistent and carefully controlled manufacturing process combined with constant process monitoring and detailed quality control ensure the production of

high-grade feed stocks with reproducible product characteristics. The basis of our value added KMS products are highly performing raw materials. The result culminates in a spray dried granulate that exhibits superior ceramic properties for pressed bodies. Of particular advantage is the moderate sintering temperature range, as the recommended firing temperature lies between 1550°C and 1630°C.

Martinswerk has a proud history of being a competent supplier and a cooperative partner with its customers. This framework has resulted in creating value-driven solutions for particular ceramic requirements. We have demonstrated that we have the experience, the know-how and the right attitude to deal with your feedstock preparation.

## MARTOXID® KMS

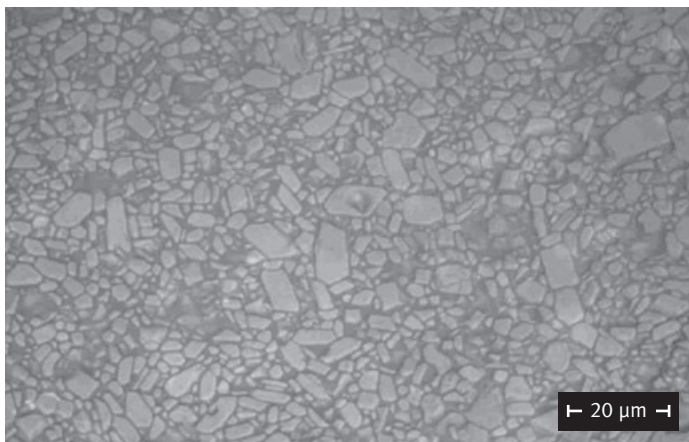
|                   |   |                     |   |
|-------------------|---|---------------------|---|
| <b>Feedstock</b>  | 92 - 99.7% Al <sub>2</sub> O <sub>3</sub>   | <b>Grades</b>       | Bodies ‘Ready to Press’ <ul style="list-style-type: none"><li>■ KMS-100</li><li>■ KMS-99</li><li>■ KMS-98</li><li>■ KMS-96</li><li>■ KMS-94</li><li>■ KMS-92</li></ul>              |
| <b>Properties</b> | <ul style="list-style-type: none"><li>■ Custom Made</li><li>■ Superior Workability</li><li>■ Good Pressability – Uniaxial and Isostatic</li><li>■ Excellent Sinterability</li><li>■ First-Rate Ceramic Properties</li><li>■ High Wear Resistance</li><li>■ High Mechanical Strength</li><li>■ Excellent Price Performance Ratio</li></ul> | <b>Applications</b> | <ul style="list-style-type: none"><li>■ Ballistics</li><li>■ Engineering Ceramics</li><li>■ Electronic Components</li><li>■ Functional Ceramics</li><li>■ Anti-Wear Parts</li></ul> |

## MARTOXID® KMS-Grades: Product Characteristics, Typical Values

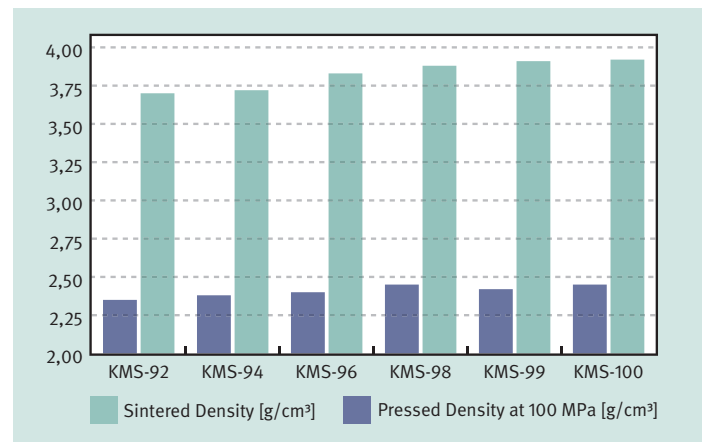
| MARTOXID  | KMS-100   | KMS-99  | KMS-98  | KMS-96      | KMS-94      | KMS-92      |
|---|-----------|---------|---------|-------------|-------------|-------------|
| Al <sub>2</sub> O <sub>3</sub> -content [%]     | > 99.5    | > 99    | 98      | 96          | 94          | 92          |
| Na <sub>2</sub> O-content [%]                   | 0.03      | 0.03    | 0.05    | 0.05        | 0.05        | 0.05        |
| Loss on Ignition [%]                            | 3         | 3       | 3       | 3           | 3           | 4           |
| Moisture [%]                                    | < 0.4     | < 0.4   | < 0.4   | < 0.4       | < 0.3       | < 0.5       |
| Bulk Density [kg/m <sup>3</sup> ]               | 1250      | 1250    | 1200    | 1150        | 1200        | 1100        |
| Average Granule Size [μm]                       | 150       | 150     | 150     | 180         | 100         | 230         |
| Pressed Density at 100 MPa [g/cm <sup>3</sup> ] | 2.45      | 2.42    | 2.45    | 2.40        | 2.38        | 2.35        |
| Sintered Density** [g/cm <sup>3</sup> ]         | 3.93      | 3.92    | 3.88    | 3.83        | 3.72        | 3.70        |
| Ideal Sintering Temperature Range [°C]          | 1630      | 1600    | 1600    | 1550 - 1600 | 1590 - 1620 | 1550 - 1600 |
| Shrinkage [%]                                   | 15        | 15      | 15      | 15          | 14          | 15.5        |
| Bending Strength, 4-Point Method [MPa]          | 400 - 500 | > 330   | > 330   | > 300       | > 280       | > 280       |
| Modulus of Elasticity E [GPa]                   | 400       | 380     | 370     | 340         | 320         | 330         |
| Hardness, Vickers HV2 [kN/mm <sup>2</sup> ]     | 18 - 20   | 17 - 20 | 17 - 19 | 17 - 19     | 16 - 18     | 16 - 18     |
| Abrasion, Sand Blasting Method [%]              | *         | *       | 0.1     | 0.1         | *           | 0.6         |
| Dielectric Strength E <sub>d</sub> [kV/mm]      | 30        | 35      | 33      | 35          | > 20        | > 20        |
| Ballistic Properties                            | ++        | ++      | +       | +           | *           | *           |

\* Not determined \*\* Retention time at optimum temperature 2 h

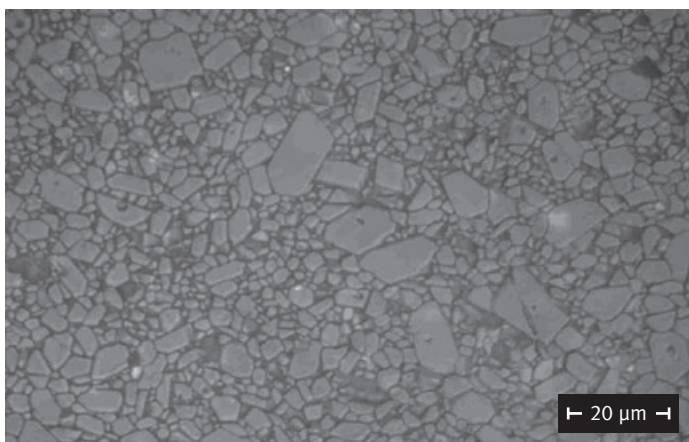
KMS-96: SEM photograph, operation pressure 130 MPa, 1590°C, sintered density 3.82 g/cm<sup>3</sup>, average grain diameter approx. 4 μm



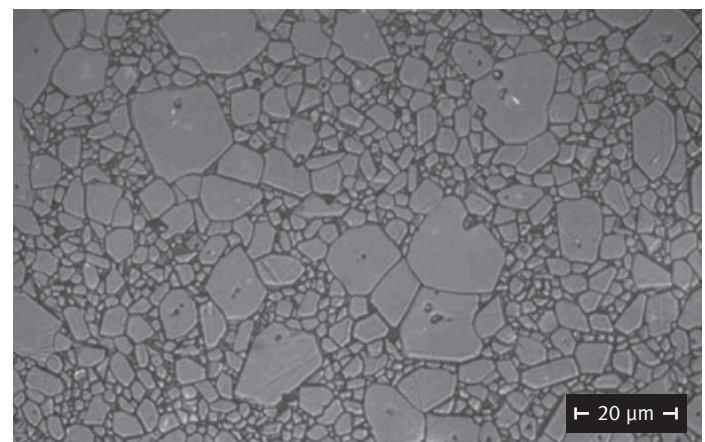
Ceramic Feedstocks “KMS”, Pressed and Sintered Densities



KMS-98: SEM photograph, operation pressure 140 MPa, 1590°C, sintered density 3.88 g/cm<sup>3</sup>, average grain diameter approx. 5 μm



KMS-99: SEM photograph, operation pressure 140 MPa, 1620°C, sintered density 3.92 g/cm<sup>3</sup>, average grain diameter approx. 7 μm





We are confident that we can meet your requirements for high-quality products and services, now and in the future. If you require more information, please contact one of our regional offices.

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