

Positioning and welding pins

FRIALIT®-DEGUSSIT® High-Performance Ceramics

www.friatec.de

LOW COSTS **HIGH QUALITY IN CAR BODY CONSTRUCTION**

Renowned automobile manufacturers use positioning and welding pins made of FRIALIT-DEGUSSIT High-Performance Ceramics.

YOUR BENEFITS

- Up to 100 times more durable than steel
- High resistance to wear-and-tear
- Diamond-like hardness
- Excellent stability of shape
- Absolute positioning accuracy
- Outstanding surface quality
- Electrically insulating
- High dimensional quality of the welding sets
- No deformation of sealing holes
- No insulation necessary
- Low process variations

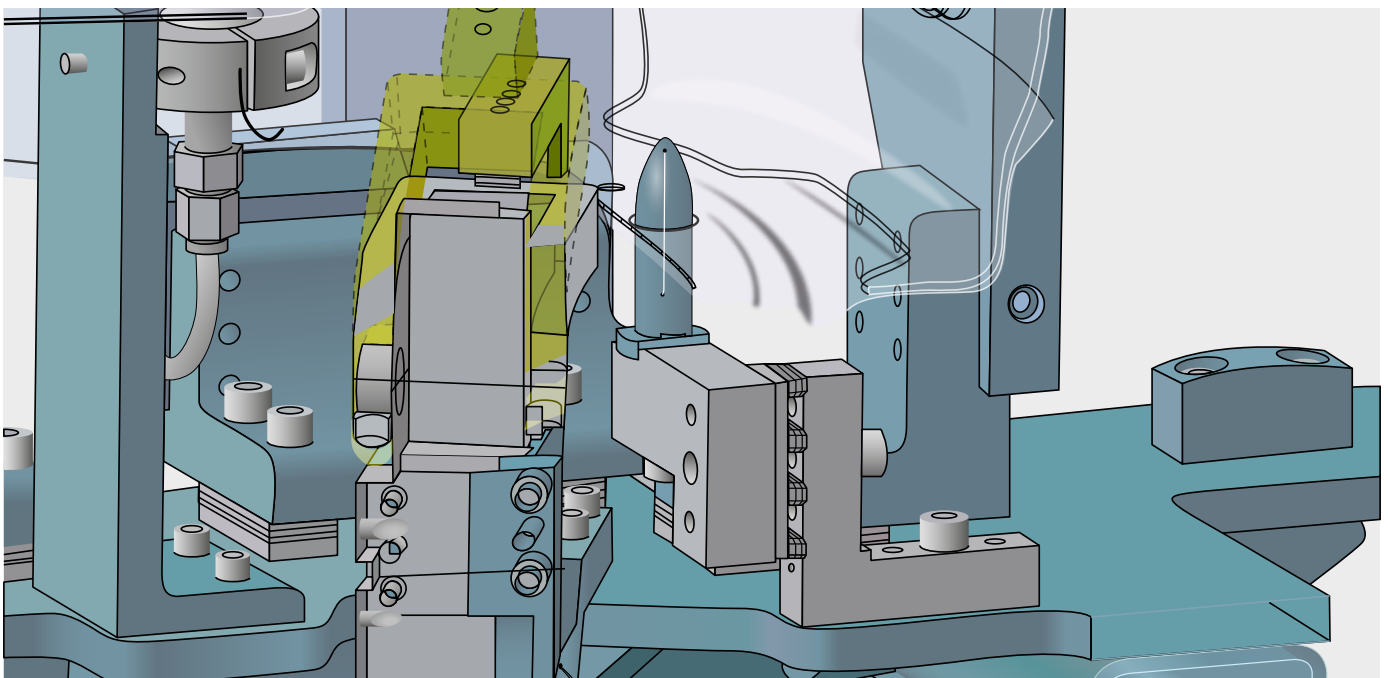


**Pins are manufactured
in several models.**

GREATER PERFECTION AND PRECISION IN CAR MANUFACTURE

FRIALIT®-DEGUSSIT® **HIGH-PERFORMANCE CERAMICS**

Only pins with high-performance ceramics meet the high demands of the automotive industry. A material combination of metal and ceramics guarantees an optimised utilisation of special material properties. Our ceramic-to-metal components outclass a single material considerably.



**Ceramic-to-metal
components for
highest demands
in car body
manufacturing.**



Positioning pins – ceramic rod version in metal substrate



Positioning pins – ceramic cap version in metal substrate

EXTREME RESILIENCE

Due to their unique properties, ceramic-to-metal components from FRIATEC are highly impressive. Our FRIALIT-DEGUSSIT High-Performance Ceramics are extremely resistant to heat, corrosion, high voltage and chemical influences. They also have excellent stability of shape and resistance to wear-and-tear, thus longer retaining their functionality.

PRECISION AND ECONOMY

Our materials have become a must in the automobile industry. Positioning and welding pins made of FRIALIT-DEGUSSIT High-Performance Ceramics exactly and precisely align the body parts to be welded and fix them securely. A vast number of car manufacturers all over the world are highly impressed by our components and benefit from advantages like low tool costs, reduced downtimes and also minimum service charges.

EXCELLENT TOP RATINGS FOR OUR HIGH-PERFORMANCE CERAMICS

With their outstanding material properties, components made of FRIALIT-DEGUSSIT High-Performance Ceramics have become firmly established in the global automobile industry. Precision solutions for various requirements are achieved by the wide range of FRIATEC materials.

With the development of FRIALIT-DEGUSSIT High-Performance Ceramics, FRIATEC successfully combined the outstanding properties of the individual materials metal and ceramics into one single component. Our high-performance ceramic products are extraordinarily resistant to high temperatures, wear-and-tear and corrosion. Together with their breaking strength and integrity of shape their extremely long lifetime makes FRIALIT-DEGUSSIT High-Performance Ceramics highly convincing.

Our customers expect tailor-made solutions for their individual needs and tasks. The comprehensive range of materials enables us to manufacture optimal components according to customer requirements. The physical material properties listed in the table clearly illustrate the potential of FRIALIT-DEGUSSIT High-Performance Ceramics.

Long lifetime
thanks to
individual
solutions.



Properties	Unit	Steel	FRIALIT HP 79 Ceramics Si_3N_4 (black)	FRIALIT FZT Ceramics Al_2O_3 (+ ZrO_2) (white)	DEGUSSIT DD57 Ceramics Al_2O_3 (red)
Density	g/cm^3	7.9	> 3.2	≥ 4.05	≥ 3.90
Hardness HV 10	GPa	¹	1,600	2,000	2,300
Compressive strength	MPa	¹	3,000	3,000	3,000
Bending strength	MPa	¹	900	460	300
E-Modulus	GPa	200	310	360	380
Corrosion resistance		limited	good	very good	good
Thermal expansion	$10^{-6}/\text{K}$	11	3.2	7.5	8.5

¹ Values are different for each steel grade (see Key to Steel)

POSITIONING AND WELDING PINS **WIDE RANGE OF TOOLS FOR THE AUTOMOBILE INDUSTRY**

The car manufacturing industry only permits low production tolerances. This requirement can easily be met with the help of positioning and welding pins made of FRIALIT-DEGUSSIT High-Performance Ceramics.



**Exact
positioning for
smooth welding
processes.**



POSITIONING PINS

The fully automated positioning procedures in automotive body-shell assembly demand the very highest standards of precision. This explains why so many car manufacturers rely on positioning pins made of FRIALIT-DEGUSSIT High-Performance Ceramics. These fully ensure that all body parts can be welded with exact precision. The development of the ceramic rod version has enabled FRIATEC to again surpass the extreme breaking strength and shape integrity of their pins. The special arrangement of the ceramic rods resulted in optimisation of the product characteristics. In this way, even components with a small centering diameter (\varnothing 10 mm) achieve a high degree of stability.

In the conventional production process metal bolts had to be fitted as place-holders for pins without the rod version at the plant commissioning stage due to early damage to the delicate ceramic pins during plant set-up. The advantage of using break and bend-resistant positioning pins in the

ceramic rod version is especially obvious in the case of the small centering diameters described above. They can be inserted already at the very start of set-up and transfer-line arrangement. This saves time-consuming as well as cost-intensive plant conversion, from initial set-up through to the production stage. In terms of handling, our positioning and welding pins made of FRIALIT-DEGUSSIT High-Performance Ceramics are also most impressive. Thanks to the electrically insulating effect of ceramics no additional insulation is needed. There is virtually no welding bead adherence on the ceramics, and disruptive metal abrasion has no chance of developing.

WELDING PINS

In case of projection welding, pins made of FRIALIT-DEGUSSIT High-Performance Ceramics ensure that the nuts to be welded can be exactly positioned on the metal sheet. Here again, the manufacturer benefits from an increased plant lifetime and additionally from the high quality of the finished product.

FRIALIT®-DEGUSSIT® HIGH-PERFORMANCE CERAMICS **CERAMIC INNOVATIONS SINCE 1863**

FRIATEC manufactures components made of high-performance ceramics according to customer specifications, as well as a comprehensive standard program.

An experienced team of innovative application engineers and resourceful production specialists alongside painstaking quality controls supports our customers in their choice of ceramic material, design and project execution. More than 150 years of experience in the field of ceramic manufacturing and our individual brand of materials, combined with innovative engineering, form the pillars of our company's successful development.

Our products, made of aluminium oxide, zirconium oxide, silicon carbide and silicon nitride, are used predominantly in the following areas:

ELECTRICAL ENGINEERING

- Single and multiple feedthroughs
- High-pressure feedthroughs for onshore/offshore technology
- Insulation tubes
- Standoffs
- Accelerator components for research and development apparatus
- Sensor components for pressure, temperature, oxygen levels, etc.

HIGH TEMPERATURE TECHNOLOGY

- Tubes and insulating rods for protection and insulation of thermocouples
- Tubes for gas inlet and outlet
- Grooved and heating tubes for construction of electrically heated furnaces
- Diffusion tubes for the semi-conductor industry
- Multibore tubes
- Crucibles, boats, combustion trays and plates

MECHANICAL ENGINEERING

- Pistons for dosing pumps (fitted pistons/cylinder units)
- Plungers for high-pressure pumps
- Spacer cans for the chemical industry
- Glide rings, glide bearings, shaft protection sleeves
- Nozzles
- Shaped parts for wear-and-tear use
- Drawing cones and guide elements for the wire industry

SURFACE FINISHING

- Fine-grinding tools for surface finishing of ultra-hard materials in various shapes and dimensions

FRIATEC

INNOVATIVE SOLUTIONS FOR THE GLOBAL MARKET

INNOVATIONS FOR MORE THAN 150 YEARS

The company was founded in 1863 in Mannheim, Germany, as a brickyard and succeeded in developing its first pathbreaking innovation, chemical stoneware, in 1888. Numerous new developments followed. Among other things, the company started in the mid of the past century processing plastics and combined modern and traditional materials when producing chemical devices and facilities. The following years were characterised by the expansion in the core business and the opening up of more and more new business segments. As Deutsche Steinzeug and later as Friedrichsfeld GmbH, the company, which has been operating under the name FRIATEC AG since 1993, continuously developed to become an internationally active, diversified company.

SPECTRUM OF INNOVATIVE SOLUTIONS

As such, FRIATEC AG today offers a spectrum of innovative solutions for many industries, e.g. jointing technology for pipe systems, products for water-carrying building services, special pumps for aggressive, volatile or explosive media, but also ceramic components which are used in laboratory and electrical engineering but also in medical engineering. With its sophisticated solutions, FRIATEC AG is not only among the most well-known and well-established companies in the metropolitan region Rhine-Neckar but is also one of the global market leaders of its industry.

PARTNER OF A POWERFUL COMMUNITY

Since 2003, FRIATEC AG has been a member of the ALIAXIS group of companies with headquarters in Brussels. ALIAXIS is the worldwide largest producer of plastic pipe systems for the construction industry, the industry and utilities.

**FRIATEC AG is a specialist
company for products made
of non-corroding and
wear-resistant materials.**

Aliaxis

UTILITIES & INDUSTRY

FRIATEC Aktiengesellschaft - Ceramics Division
Steinzeugstraße 50 - 68229 Mannheim - Germany
Phone +49 (0)621 486-1378 - pins@friatec.de

www.friatec.de



WEBLINK
Positioning and
welding pins