Division FRIALIT®-DEGUSSIT®
Engineered Technical Ceramics

FRIATEC N.A. LLC
Engineered Products
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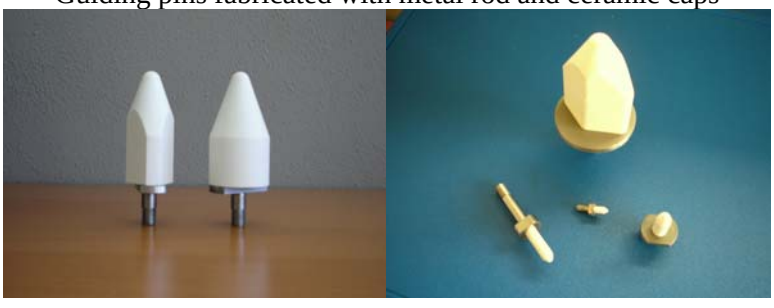
Technical Data Sheet
Ceramic Pins for the Automotive Industry

Product Description

Welding pins fabricated by FRIALIT® - DEGUSSIT® offer great accuracy in "positioning" applications within the automotive industry. We have successfully partnered with multiple automotive manufacturers and supplied welding, centering and insulating pins in both handheld and automated welding applications. Our custom ceramic pins are designed and manufactured after working closely with each customer to define the best solution for each specific application. Our team of experienced engineers are available to provide custom ceramic pin solutions for each one of your difficult applications.

Guiding pins fabricated entirely from ceramics
(Both rod and cap made of ceramics)

Guiding pins fabricated with metal rod and ceramic caps



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TDS-AI-01

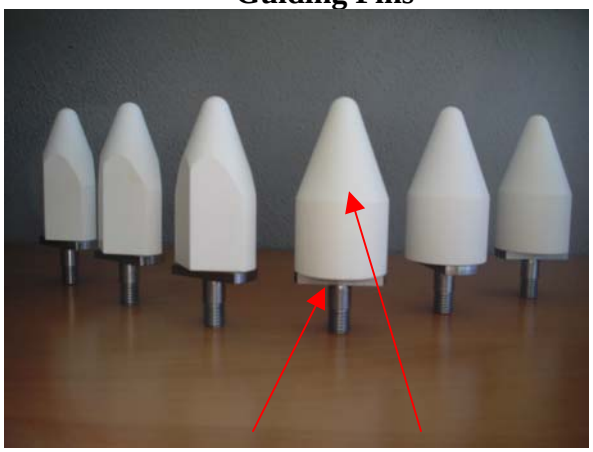
Product Benefits

- Reduced tooling costs
- Reduced down time and set-up time
- Reduced costs associated with maintenance and service
- No separate insulation is necessary
- Stable tolerances achieved using pins result in much lower rates of defective products

FRIALIT® - DEGUSSIT® Material Characteristics

- Highest wear resistance
- Extreme durability and extended life
- Highest geometrical stability
- High precision positioning
- Simple to install in pin-holder
- High surface finish and low friction properties
- Low adhesion of welding sparks
- No metal residue retention
- Highest break resistance and stability
- Non-magnetizing/antistatic
- Electrically insulating

Metal-Ceramic Joint Construction
Guiding Pins



Main body of steel (V2A) / Ceramic

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The physical properties listed below show a comparison of commonly used pin materials, such as steel and hard metal and **FRIALIT®-DEGUSSIT® FZT and FZM ceramic materials**. We work closely with our customers to determine the suitability of our ceramic materials for each specific application.

Properties	**Unit**	**Steel**	**Hard metal**	**FZT Ceramic (white)**	**FZM Ceramic (yellow)**
Density	G/cm^3	7,9	10-14	4,10	5,7
Hardness HV 10	N/mm^2	1)	ca. 1000	2300	1700
Compressive strength	N/mm^2	1)	ca. 3000	3000	2000
Bending strength	N/mm^2	1)	ca. 1000	450	500
E - Modulus	GPa	200	600	360	200
Corrosion resistance		limited	limited	Very good	Very good
Heat expansion coefficient	$10^{-6}/K$	11	7	9	10

1) Varies, depends on alloy ratio and heat treatment

Contact FRIATEC N.A. today for assistance with your locating and fixturing pin requirements.