

CERAMICS

IN RESISTANCE WELDING

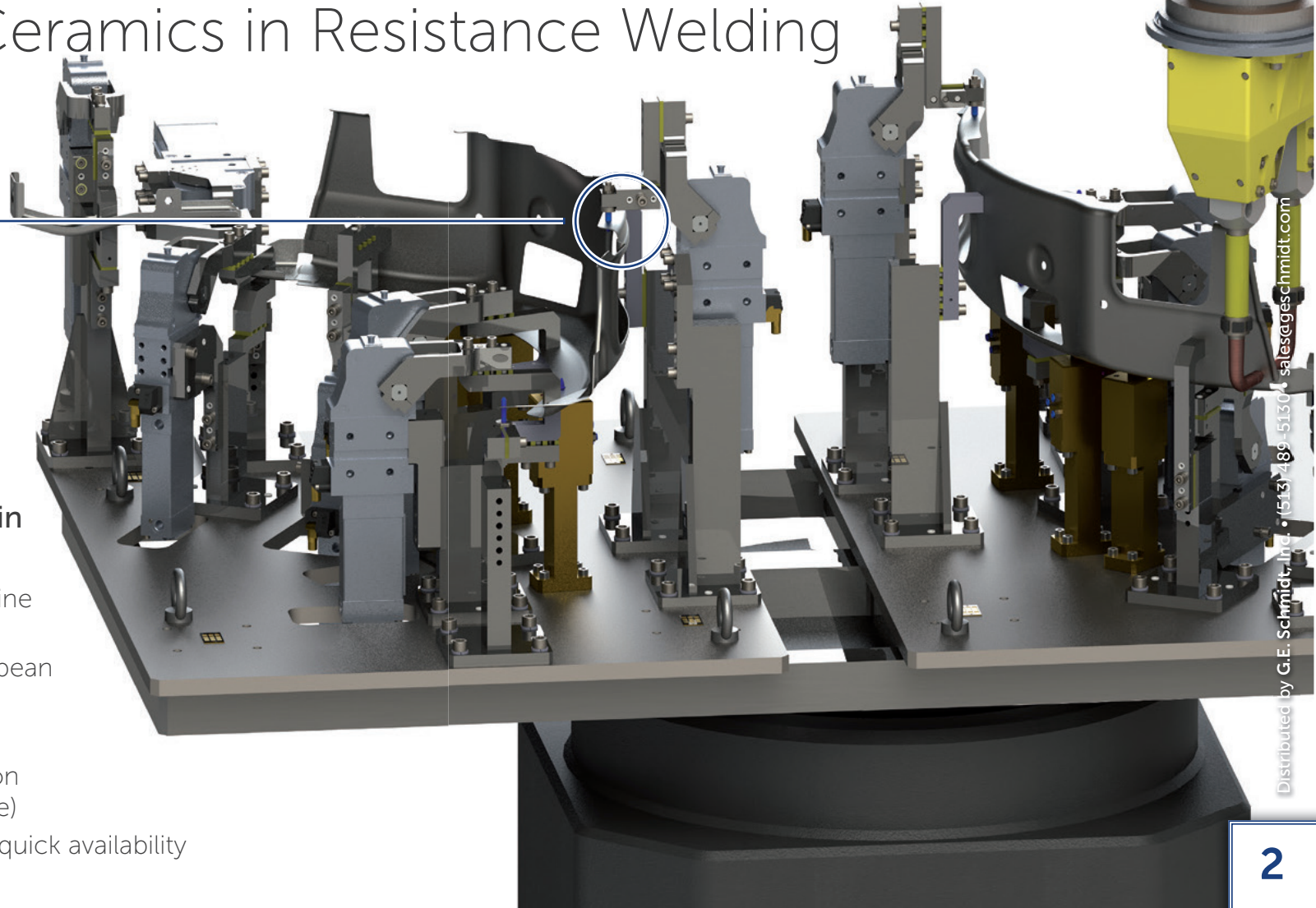


Doceram® Ceramics in Resistance Welding



Cerazur® Positioning Pin *(with threaded steel base)*

- Available in tolerances as fine as $+0/-0.05$ mm
- Developed based on European vehicle standards
- Flexible modular system
- Ready-for-use in production process (e.g. body-in-white)
- Standard components for quick availability



Doceram® Ceramics in Resistance Welding



Cerazur® Centring Pin (Nut location/welding pin)

- Cerazur® has **40x** operating life of steel
- Standard M4–M12 designs
- Noses available in "short" (pictured above), "long," or "with collar" (pictured below, right)
- Standards available for stamping hole diameters in 0.1 mm steps
- Weld pins available in Cerazur® or Volcera® (below, right)

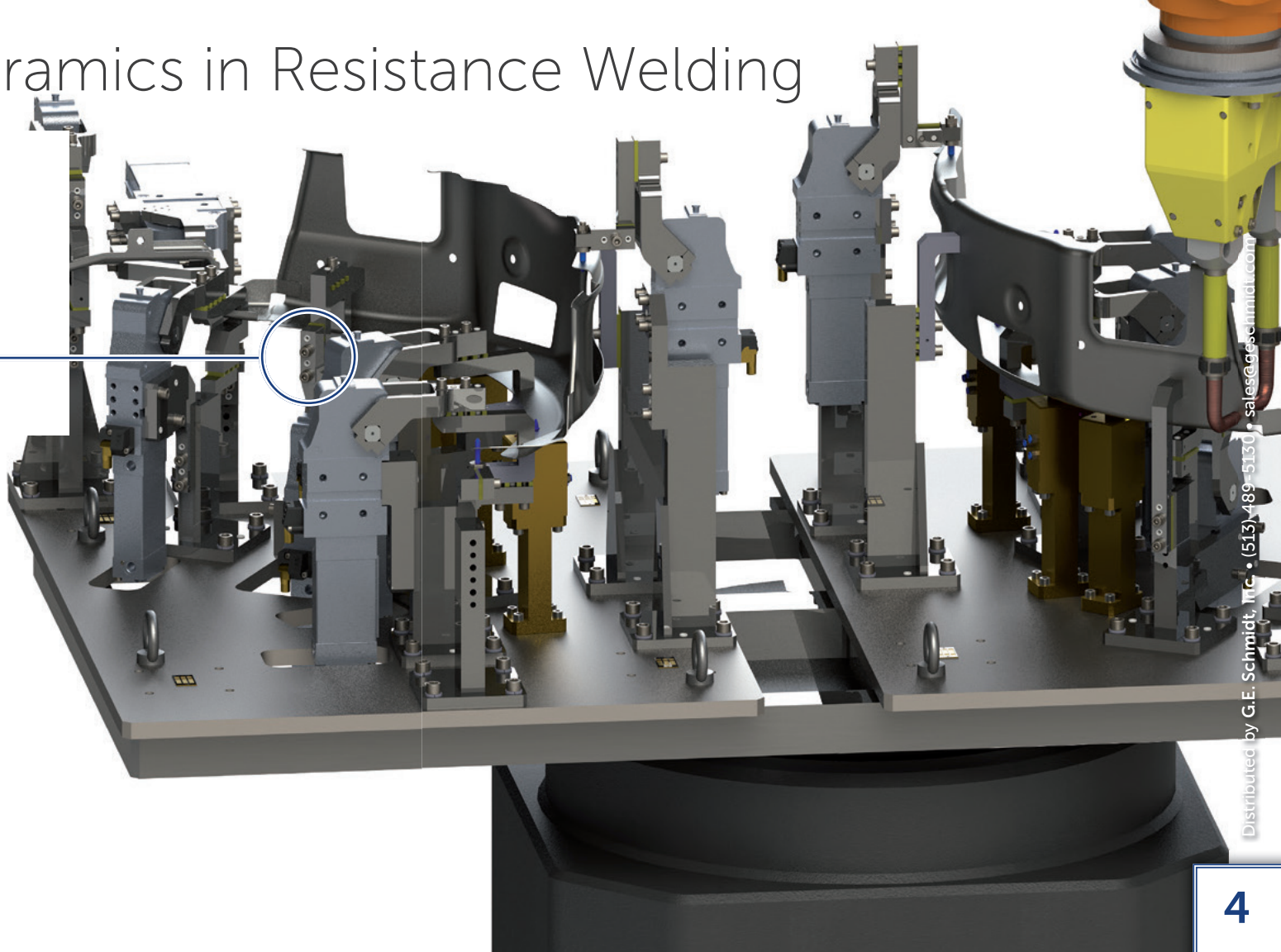


Doceram® Ceramics in Resistance Welding



Z-101 Dowel Pins
(Fixture Construction)

- Sizes from 1.5x5 mm (dia. x length) to 14x40 in stock
- Available in h6, m5, and m6 tolerances per DIN 6325 and m6 tolerance per ISO 2338
- Pull dowel pins with female threads also available (m6 tolerance per DIN 7979-D)



Doceram® Material Comparison

	Unit	A-997	ZTA	Z-101	Cerazur	Volcera
		Al_2O_3 >99.796	$\text{Al}_2\text{O}_3 + \text{ZrO}_2$	ZrO_2 Y-PSZ	ZrO_2 Y-PSZ	Si_3N_4
Color		ivory	white	white	blue	gray
Density	(g/cm ³)	3.9	4.1	6.0	6.0	3.2
Bending strength	(MPa)	390	600	1000	1300	750
Compressive strength	(MPa)	3900	3600	3000	3000	2500
E-modulus	(Gpa)	390	350	205	205	320
Impact strength	(Mpa m ^{1/2})	5.2	7.5	8.0	12.0	6.7
Weibull modulus		12	18	22	25	15
Vickers hardness	(HV 0.5)	2000	1600	1300	1150	1650
Thermal expansion	(10 ⁻⁶ /K)	5.5 - 8.4	6.0 - 8.6	10.0	10.0	3.4
Thermal conductivity	(W/mK)	28	18	<2	<2	22
Thermal shock resistance	(ΔT°C)	280	320	270	280	550
Max. operating temperature	(°C)	1700	1000	1000	1000	1000
Specific resistance at 20°C	(Ω cm)	>10 ¹⁵	>10 ¹³	>10 ¹⁰	>10 ¹⁰	>10 ¹¹
Dielectric strength	(kV/mm)	30	-	-	-	20



Z-101

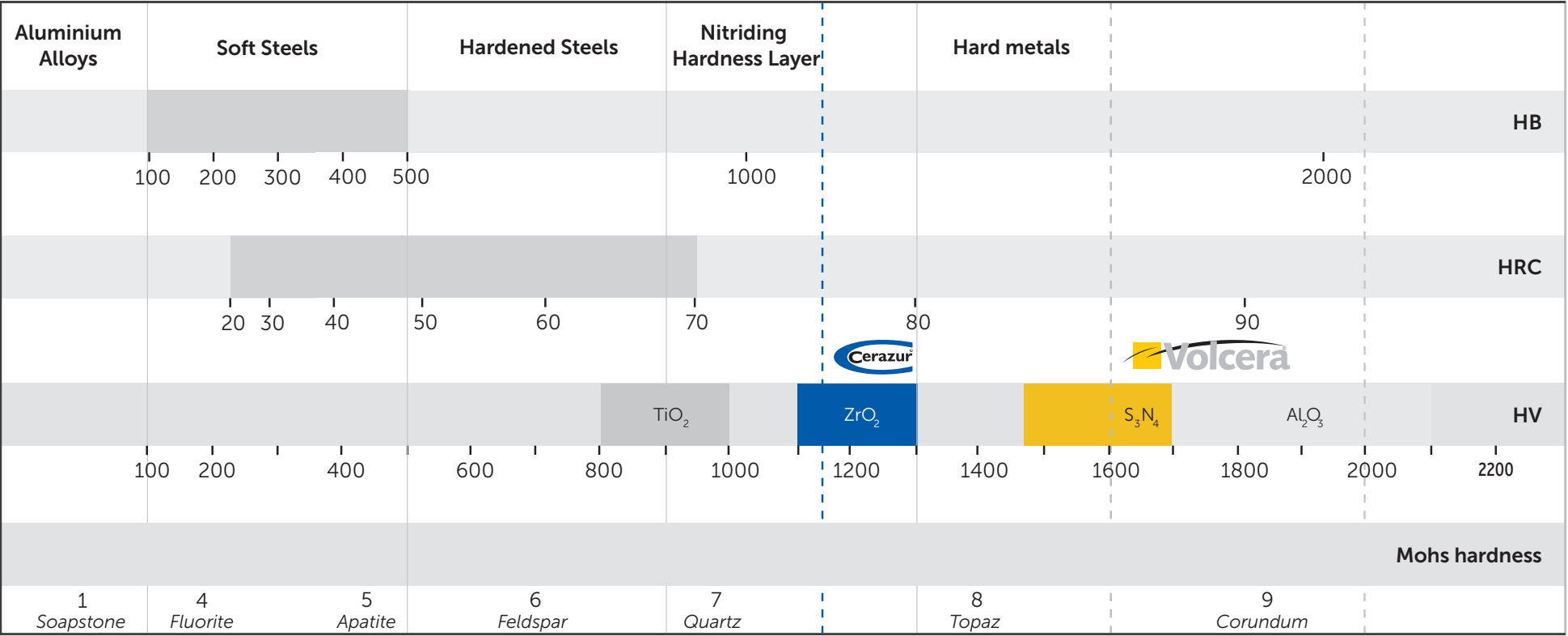


Cerazur



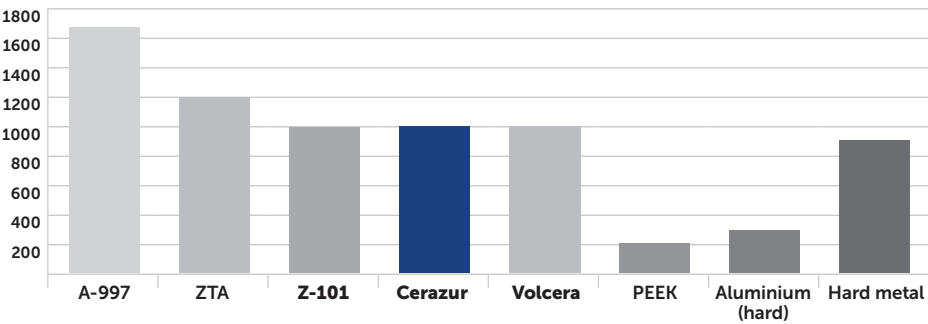
Volcera

Doceram® Ceramic Hardness Comparison

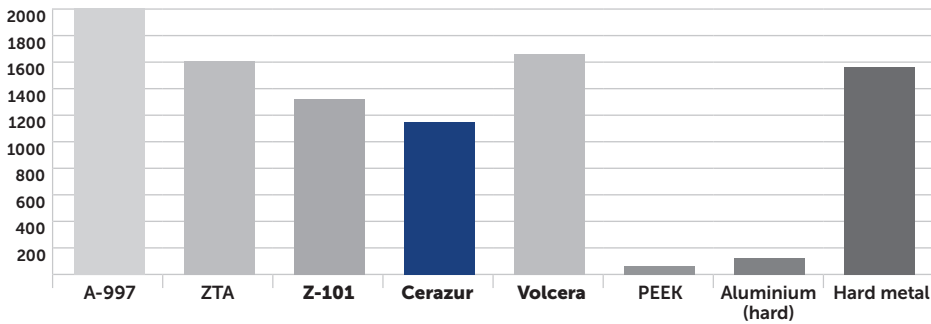


Doceram® Material Comparison

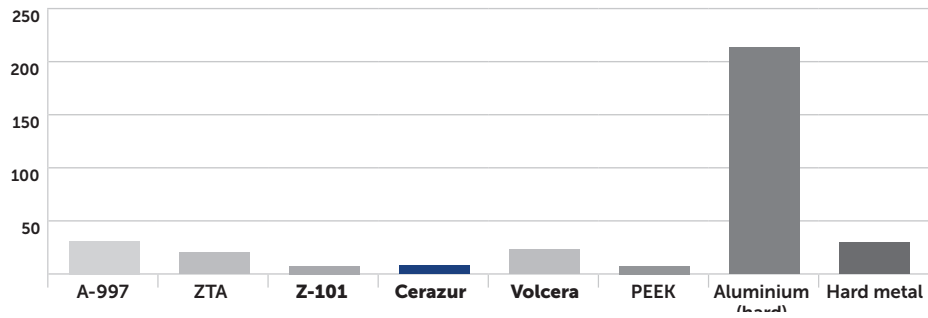
Max Operating Temperatures (C°)



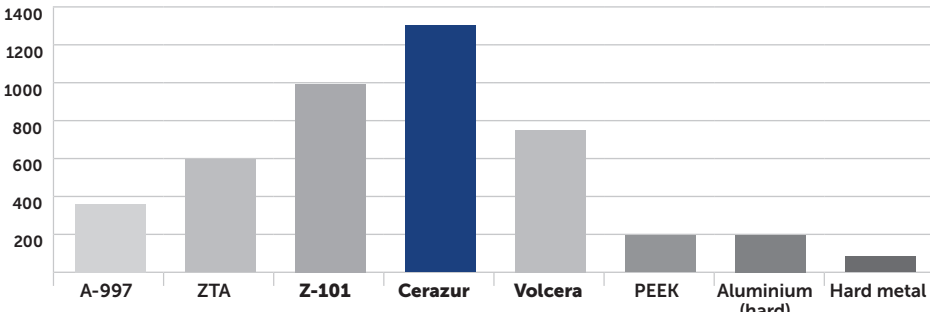
Material Hardness (HV)



Heat Conductivity (W/mK)

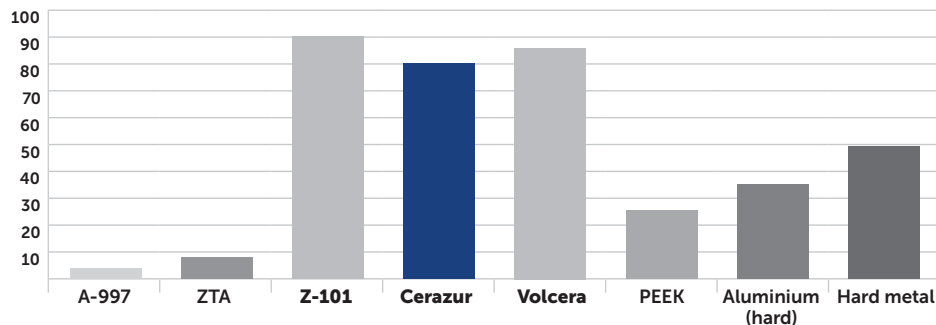


Tensile Bending Strength (MPa)

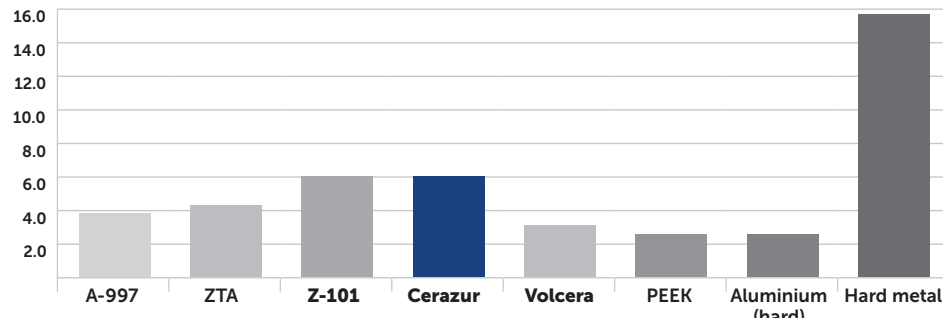


Doceram® Material Comparison

Abrasive Wear After Time (t)



Specific Weight (g/cm³)



Contact **G.E. Schmidt, Inc.**
for special pricing on
sample ceramic components



(513) 489-5130
sales@geschmidt.com

G.E. Schmidt Business Overview



Resistance Welding Consumables

- Weld Pins
- Electrodes
- Adapters
- Welding Caps
- Specialty Tooling
- Gun Arms
- Shunts
- Cables

Capital Equipment

OEM

- ProLine Pedestal Welders
- ProLine Nut Verification System
- ProLine Swing Arm
- ProLine NP² Nut Presence Probe

Distributed

- SEKI Nut/Stud Feeders
- Tip Dressers and Accessories
- Auto Tip Changers
- Pinch Point Safety Systems

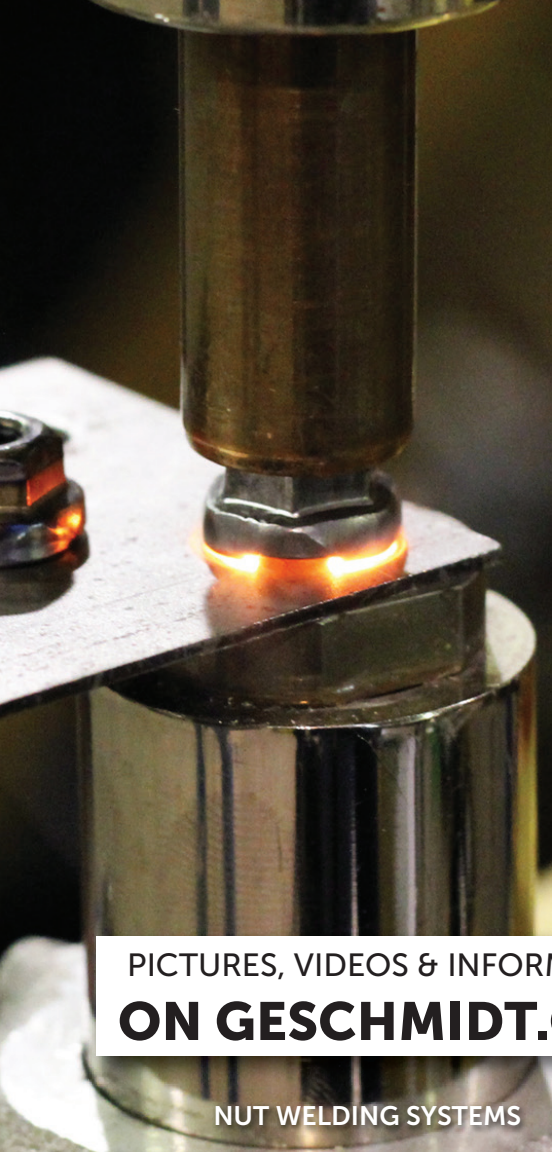
Engineering Services

- 3D Modeling
- Tooling Design
- Custom Solutions
- Resistance Welding Training

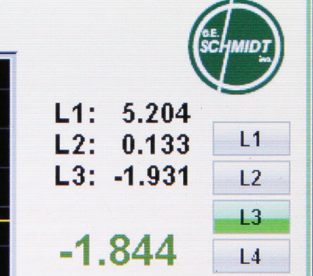
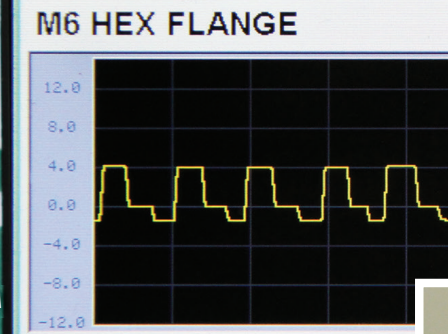


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• Mexico • Germany • India •
Taiwan • Japan • South Korea



NUT VERIFICATION SYSTEM



WELD PINS & COMPONENTS



SEKI AIR ROD NUT FEEDER

PICTURES, VIDEOS & INFORMATION
ON GESCHMIDT.COM

NUT WELDING SYSTEMS



TIP DRESSERS & CHANGERS



SEKI FEEDERMATE