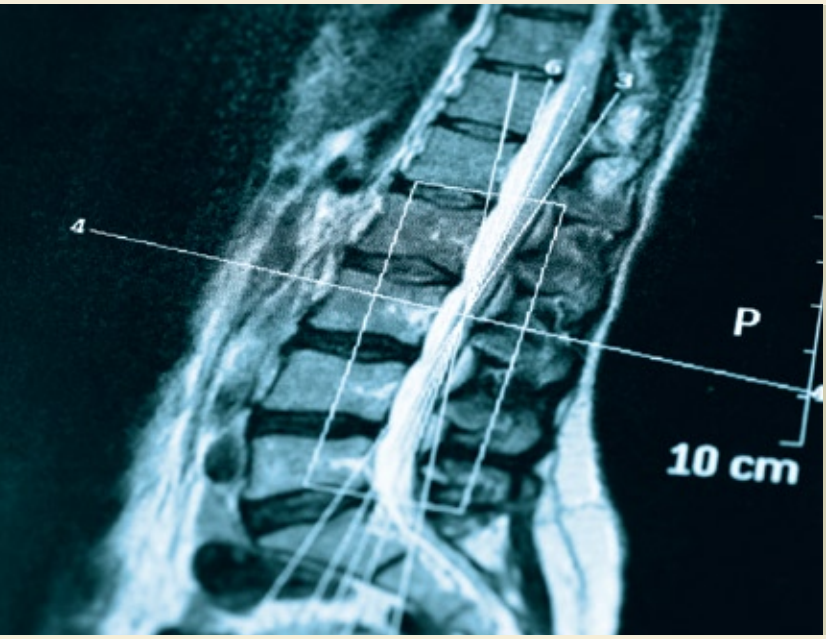
ceramic spinal components

C5 medicalwerks

C5 medical werks global headquarters
2451 Riverside Parkway | Grand Junction, CO 81505 USA
+1.877.C5WERKS (259.3757) t | +1.970.683.7999 f
info@c5medicalwerks.com | www.c5medicalwerks.com

C5 medical werks european contacts
France +33.6.77.50.04.08 | info@c5medicalwerks.fr
Germany +49.831.5758.200 | info@c5medicalwerks.de
Europe +1.970.683.7900 | info@c5medicalwerks.com
www.c5medicalwerks.fr | www.c5medicalwerks.de



Ceramic Spinal Components

C5 Medical Werks manufactures high precision ceramic components and assemblies for total disc replacement. We work with our customer's medical design team to refine designs for manufacturability and to optimize all aspects of the manufacturing process. A heritage of almost a century of experience in producing wear resistant ceramics for high-tech industries is reflected in our materials pedigree. As always, customers retain ownership of all designs and patents.

Contact our medical ceramic experts today for more information about our Total Disc Replacement (TDR) components for spinal motion preservation.

Advantages of C5 Medical Werks:

- ISO 13485 certified facility
- 21CFR 820 compliant facility
- World class manufacturing
- High-tech inspection and test capabilities
- R&D for next generation materials & processes
- Manufacturer of spinal components based on customer design & specification

Advantages of C5 Medical Werks Materials:

- Ceramic on ceramic Total Disc Replacement (TDR) components may help reduce the risk of osteolysis
- Our high-purity ceramic can deliver reduced wear versus metal and plastic bearing surfaces
- Ceramic materials can reduce particle count and size versus metal and plastic bearing surfaces
- Long-term R&D supports the production of next generation spinal motion preservation components

Advantages of C5 Medical Werks Manufacturing:

- Advanced ceramic TDR component manufacturing and assembly in a state-of-the-art facility
- High-tech inspection and test capabilities in a world-class facility
- TDR component manufacturing is performed in a "medical only" ceramic production facility

Manufacturing Capabilities Include:

- Ceramic material formulation
- Design for manufacturability
- Ceramic component manufacturing
- Assembly in environmentally controlled area
- Advanced testing and inspection

*Typical Material Properties**

Property	Method	Units	Alumina	Zirconia (YTZP)
Color	Visual	N/A	White	White
Density	ASTM C-373	g/cm^3	3.98	6.07
Porosity	ASTM C-373	%	0.0	0.0
Elastic Modulus	ASTM C1198	GPa	400	210
Poisson's Ratio	ASTM C1198	N/A	0.22	0.23
Flexural Strength	ASTM C1161	MPa	500	1500
Hardness	ASTM C1327	(Hv)	18.8 (1920)	12.9 (1320)
CTE	ASTM C372 (25 - 900° C)	1 x 10^{-6}/ °C	8.5	11.3
Biocompatibility	ISO 10993-5	N/A	Pass	Pass

*Note: This chart is intended to illustrate typical properties. Engineering data is representative. Property values vary somewhat with method of manufacture, size and shape of components. Any suggested applications are not made as a representation or warranty that the material will ultimately be suitable for such applications. The customer is ultimately responsible for all design and material suitability decisions. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which C5 Medical Werks assumes legal responsibility. ANY WARRANTY OR REPRESENTATION FOR WHICH C5 MEDICAL WERKS IS RESPONSIBLE SHALL BE SUBJECT TO A SEPARATELY NEGOTIATED AGREEMENT. C5 Medical Werks will certify material properties upon request.