

Dental

Ceradyne has produced ceramic dental brackets since 1986 when the company co-invented brackets using Transtar®, a translucent polycrystalline aluminum oxide (TPA) that has helped change the lives of millions of people by improving their self-image while undergoing orthodontic treatment.

Another Ceradyne dental innovation is the zirconium oxide implant. These injection molded components are an appealing white color that eliminate darkness at the gum line often seen when titanium inserts are used. Ceradyne also supplies injection molded zirconium oxide blank “crowns” that can be finish-machined and coated by the dental lab.

Ceradyne’s molded ceramic dental system offers a cost effective alternative to expensive machining, with more consistent part reproducibility and less induced stress.

These components, produced from zirconium oxide, not only provide the strength, toughness and durability required for dental applications, but they also offer the visual appeal that has been Ceradyne’s trademark.

Ceradyne produces its dental products using a unique ceramic injection molding (CIM) process that is designed to fabricate small intricately shaped components to high dimensional accuracy without the need for secondary operations. In general, this technology is used where other fabrication techniques are not cost effective.

Ceradyne will continue to work with dental companies to develop new applications using state-of-the-art advanced technical ceramic technologies.

Brackets
Implants
Abutments
Crowns

*Materials: Zirconium Oxide
and Aluminum Oxide*



Dental

Unique Benefits of Advanced Ceramics

Advanced ceramic components set specification standards that cannot be met by similar products made from metals or plastics. Ceradyne's ceramics provide the dental industry the following superior benefits:

- Strength
- Toughness
- Wear Resistance
- Biocompatibility
- Visual Appeal

Stringent Quality Standards

Ceradyne employs an ISO 9001:2000 quality system that is augmented by previous experience gained while meeting stringent military and automotive quality standards.

This performance history demonstrates that Ceradyne's products will meet or exceed the stringent requirements of the dental industry.

Contact Ceradyne's technical sales engineers to learn how you can benefit by using Ceradyne advanced technical ceramics in your application.

Property	Units	Aluminum Oxide		Zirconium Oxide	
		Transtar®	Ceralloy® 138-DM	YTZP	YTZP
Grade					
Process		Sinter	HIP	Sinter	HIP
Purity	%	99.9%	99.9%	97%	97%
Density	(g/cm ³)	3.99	3.98	6.05	6.05
Flexural Strength	(MPa)	300	520	1050	1275
Fracture Toughness	(MPam ^{1/2})		3.5	12	12
Hardness	(Kg/mm ²)		1900	1300	1300
Elastic Modulus	(GPa)	395	410	211	211
Coefficient of Thermal Expansion	(x10 ⁻⁶ /K)	8.3	9.2	10.3	10.3
Thermal Conductivity	(W/mK)	35	31		
Electrical Resistivity	(Ohm-cm)	>10 ¹⁵	10 ¹⁴		
Key Features		Translucent	Translucent	High Strength and High Fracture Toughness	High Strength and High Fracture Toughness

Property values are typical and should not be considered specifications.



3169 Red Hill Avenue, Costa Mesa, CA 92626
714-549-0421 | Fax: 714-549-5787 | Email: info@ceradyne.com
www.ceradyne.com



Ceradyne Advanced Technical Ceramics

Ceradyne, Inc. (NASDAQ:CRDN) is a publicly traded corporation specializing in development and vertically integrated production of advanced ceramic materials at facilities based in the North America, Europe and Asia. Ceradyne's advanced ceramics are sought for the most demanding applications in automotive/engine, industrial wear, medical/dental, electronic and defense industries.

Ceralloy components are produced in fully dedicated facilities using patented compositions and processing techniques. Plentiful raw materials are coupled with conventional, time-tested ceramic manufacturing processes that produce high quality, cost effective advanced ceramic solutions.