



Advanced Alumina  
Semiconductor



# Advanced Alumina Materials & Manufacturing Processes for Semiconductor

CoorsTek provides state-of-the-art materials manufactured using the most cost-effective processes. CoorsTek maintains efficient, large-scale manufacturing facilities to support quick-turn prototype development and high-volume production.

## Wide Variety of Manufacturing Options

- Injection molding
- Roll compacting
- Extruding
- Co-firing
- Isostatic pressing
- Dry pressing
- Hot pressing
- Tape casting
- Slip casting
- And more

## Advanced Finishing Services

- Engineering design and support
- Precision grinding and lapping
- Laser machining
- Metallizing
- Ceramic-to-metal brazing
- Specialized coatings
- Threaded components
- Precision motion components
- Complex cleanroom assemblies

CoorsTek is uniquely capable of providing advanced materials and manufacturing technologies. Contact our specialists for help selecting the best materials and design for manufacturability.

Property	Units	Test	AD-96	AD-995	AD-996	PlasmaPure™ AD-998	PlasmaPure-UC™	SAPPHAL®	ADS 11
			Nom. 96%	Nom. 99.5%	Nom. 99.6%	Min. 99.8%	Min. 99.9%		
Density	gm/cc	ASTM-C 20	3.72	3.90	3.90	3.93	3.92	3.99	3.90
Crystal Size, Average	MICRONS	THIN-SECTION	6.0	6.0	6.0	6.0	3.0	25.0	6.0
Color	*	*	White	Ivory	Ivory	Ivory	Ivory	Translucent	Ivory
Flexural Strength (MOR), 20° C	MPa (psi X 10 <sup>3</sup> )	ASTM-F417	358 (52)	379 (55)	379 (55)	400 (58)	400 (60)	300	350
Elastic Modulus, 20° C	GPa (psi X 10 <sup>6</sup> )	ASTM-C848	303 (44)	370 (54)	370 (54)	370 (54)	386 (56)	395	360
Poisson's Ratio, 20° C	*	ASTM-C848	0.21	0.22	0.22	0.22	0.22	0.23	0.24
Compressive Strength, 20° C	MPa (psi X 10 <sup>3</sup> )	ASTM-C773	2068 (300)	2600 (377)	2600 (377)	2680 (390)	2700 (392)	*	*
Hardness	GPa	Rockwell 45N	78	83	83	83	86	*	*
Tensile Strength 25° C	MPa (psi x 10 <sup>3</sup> )	ACMA TEST #4	221 (32)	262 (38)	-	275 (40)	283 (41)	*	*
Fracture Toughness, K1c	MPa m <sup>1/2</sup>	Notched Beam	4 - 5	4 - 5	4 - 5	4 - 5	4 - 5	4.0	4.5
Thermal Conductivity, 20° C	W/m °K	ASTM-C408	24.7	30.0	30.0	30.0	35.0	35	30
CTE, 25-1000° C	1X 10 <sup>-6</sup> /°C	ASTM-C372	8.2	8.2	8.2	8.2	8.1	8.0	7.8
Specific Heat 100° C	J/kg*K	ASTM-E1269	880	880	-	880	870	800	800
Thermal Shock Resistance, ΔTc	°C	NOTE 3	250	200	200	200	200	200	220
Maximum Use Temperature	°C	NO-LOAD COND.	1700	1750	1750	1750	1750	1800	1500
Volume Resistivity, 25° C	Ohm-cm	ASTM-D1829	> 10 <sup>14</sup>	> 10 <sup>14</sup>	> 10 <sup>14</sup>	> 10 <sup>14</sup>	> 10 <sup>14</sup>	10 <sup>17</sup>	10 <sup>16</sup>
Volume Resistivity, 500° C	Ohm-cm	ASTM-D1829	4 x 10 <sup>9</sup>	2 x 10 <sup>10</sup>	2 x 10 <sup>10</sup>	1 x 10 <sup>11</sup>	3.3 x 10 <sup>12</sup>	*	*
Volume Resistivity, 1000° C	Ohm-cm	ASTM-D1829	1 x 10 <sup>6</sup>	2 x 10 <sup>6</sup>	2 x 10 <sup>6</sup>	3 x 10 <sup>6</sup>	1.1 x 10 <sup>7</sup>	*	*

\*Data not available.

The chart is intended to illustrate typical properties. Property values vary with method of manufacture, size, and shape of part. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which CoorsTek assumes legal responsibility. CoorsTek is a registered trademark of CoorsTek, Inc. PlasmaPure is a trademark of CoorsTek, Inc.

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