ASUZAC Inc.

We love people. We love nature.

Fine Ceramics Division

http://www.asuzac-ceramics.jp/

Asuzac Group aims to be an integrated life company

We strive to contribute to the success of our customers and society as a whole by serving a wide range of fields, from natural, urban, and residential environments, to the food industry and every day life!

Mission

ASUZAC Group, as an integrated life company, constantly focuses on society's needs.

- Customer satisfaction
- Cultivation of civilization
- Growth and stability
- Contribution to society
- Expansion into new industries

Stance

We at ASUZAC strive to serve our customers, and the community, through teamwork, quick response, creativity, and devotion.

Our Philosophy

1. To serve our customers and society honestly and sincerely
2. To provide our customers and society with better-than-expected value
3. To demonstrate group cooperation while growing our individual capabilities
4. To realize that nothing is complete; innovation is constant
5. To reconcile work culture with personal growth
6. To be cheerful and make work fun

An integrated life company

ASUZAC Group

Eat

- Health and Food
  - Foods
    - Dried Foods
    - Growing
    - Packaging

Live

- Infrastructure
  - Infrastructure Engineering
    - Roadways
    - Waterways
    - Retaining Walls
    - Rivers
  - Aluminium
    - Bridges
    - Parks
    - Street Furniture
    - Exterior
    - Interior
- Landscaping
  - Fine Ceramics
    - Material Development
    - Semiconductor Fabrication Equipment Parts
- Residential
  - Planning & Development

Use

- Technology
  - Planning & Development
    - Production Equipment
    - Mechanical Parts
    - Electrical parts

International Activities

ASUZAC Group

Established	April, 1946
President/CEO	Masanao Kubo
Companies	9 (4 domestic, 5 global)
Divisions	5
Employees	1228 (600 domestic, 628 global)

ASUZAC Inc.

Headquarters	981 Nakayama, Takayama, Nagano, Japan 382-8508
Established	April, 1946
Capital	63.5 million yen
President/CEO	Masanao Kubo

ASUZAC FOODS Inc.

Headquarters	293-45 Yonamochi, Suzaka, Nagano, Japan 382-0041
Established	November, 1973
Capital	98 million yen
President/CEO	Masanao Kubo

» Our Product Lineup

■ MATERIAL CHARACTERISTICS

As of Aug-2017

	MATERIAL CHARACTERISTICS	UNIT	Alumina				Zirconia	Silicon Carbide		Electrically Conductive: Corseed	Low Thermally Conductive: Alsima L	R&D/Prototype Purposed: Black Almina
			AR-99.6	ARW	ARK	AR-4N	AZI	ASiC	SiC3N	ACTR	ARSM-L	AR(B)
	Purity	%	99.6	99.6	96.0	99.99	92	-	99.9	99.8	-	99.9
	Color Tone	-	Ivory	White	White	White	White	Black	Black	Dark Gray	Ivory	Black
	Denstity	g/cm^3	3.94	3.90	3.75	3.94	6.00	3.14	3.19	4.24	2.41	3.75
Mecanical Characteristics	Flexural Rigidity	MPa (3points)	370	400	370	330	980	410	450	310	146	539
	Young's Module	GPa	390	370	340	360	210	430	446	288	115	363
	Vickers Hardness	GPa	14.7	14.7	14.0	15.7	11.8	28.0	28.0	10.0	6.5	10.6
	Poisson's Ratio	-	0.24	0.24	0.24	0.23	-	0.17	0.17	0.27	0.29	0.23
	Fracture Toughness	MPa m$^{1/2}$	4.0	3.0	3.0	4.0	7.0	2~3	2~3	3.0※1	1.4※1	3.2
Heat Characteristics	Coefficient of Thermal Expansion	×10^{-6} [Ambient~800°C]	7.7	7.7	7.7	7.7	10	4.1	4.1	8.8	2.1	8.1
	Thermal Conductivity	W/(m·K)	32.0	28.0	23.0	31.0	4.0	170.0	140.0	5.5	2.9	31.2
	Specific Heat	J/(kg·K)	0.78×10^3	0.78×10^3	0.78×10^3	0.78×10^3	-	0.68×10^3	0.57×10^3	0.67×10^3	0.75×10^3	0.8×10^3
Electrical Characteristics	Dielectric Constant	[1MHz]	10.2	9.7	9.5	9.5	-	-	-	-	4.8	16.7
	Dielectric Loss	×10^{-4} [1MHz]	70	5	5	5	-	-	-	-	50	10
	Volume Resistivity	Ω·cm	>10^{15}	>10^{15}	>10^{15}	>10^{15}	>10^{12}	×10^6	×10^8	1	>10^{14}	>10^{14}
	Breakdown Voltage	kV/mm	13.0	14.5	14.5	13.0	-	-	-	-	14.5	9.3
Optical Characteristics	Reflectivity	% [240-2,600nm wave length range, Measuring Plane: Approx.Ra0.8]	18~93	-	-	-	30~77	11.1~25.1	17~31	-	-	5.1~15.3
	Features and Applications		·High Rigidity ·Excellent Electrical Insulation ·Excellent Wear Resistance			·High Purity ·Less Contamination	·Excellent Thermal Resistance ·High Rigidity ·High Fracture Toughness ·Excellent Chemical Stress (Except hydrofluoric acid)	·Excellent Electrical Conductivity ·Excellent Thermal Resistance ·High Rigidity ·Excellent Wear Resistance		·Excellent Electrical Conductivity ·Less Poreless Comapct Substance than Almina ·Use in Reduction Atmosphere at High Temperature	·Low Thermal Expansion ·Excellent Thermal Shock Resistance ·Low Thermal Conductivity	·Low Reflectivity ·Excellent Electrical Resistance ·Use in Reduction atmosphere at high temperature

NOTE:
This chart is intended to illustrate typical properties found in the scientific and industrial literature. Property values may vary depending on method of manufacture and size/shape of component.
Reflection rate differs according to wave length of the light. Please contact us for further information.
※1 Figures in Alsima L and Corseed are measured with use of the SEVNB method.

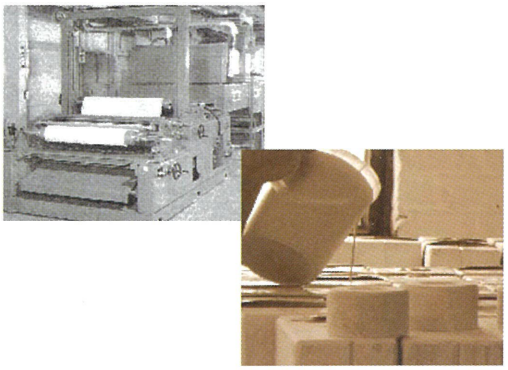
■ MATERIAL CHARACTERISTICS Porous Ceramics

As of May-2016

MATERIAL CHARACTERISTICS	UNIT	For filter,rectifier,jet			For Vacuum				Alumina	Silicon Carbide	Alsima
		Alumina			Alumina			Silicon Carbide			
		AZP-50	AZP-60	AZP-60B	AZPW-40	AZPW-45	AZPWB40	AZPS-40			
Porosity	%	50	60	73	40	43	35	40	1.0	2.2	7.3
Pore Size	μm	5~40	5~40	5~40	50~100	300~1000	50~200	5~30	-	-	5~20
Bulk density	g/cm^3	1.82	1.57	1.04	2.56	2.4	2.48	1.9	3.94	3.15	2.41
Transmission	(×10^{-13}m^2)	0.8	5.73	-	100	-	270	6.1	0	0	0
Purity	%	96	96	-	95	97	90	98	99.6	98	98
Flexural Rigidity	MPa	60	35	30	76	17	22	80	370	410	146
Dielectric constant	1MHz	-	-	-	4.1	-	-	-	10.2	-	4.8
Thermal conductivity	W/(m·K)	-	-	-	3	-	5	70	32	170	2.9
Thermal Expansion Coefficient	×10^{-6} (RT-800°C)	-	-	-	7.6 (RT-700°C)	7.6 (RT-700°C)	7.6	4.4	7.7	4.1	2.1
Temperature of heat resistance (atmosphere)	°C	1600	1600	600	1400	1400	600	1400 (Inert atmosphere)	1600	1400	1300
Color	-	White	White	Black	White	White	Black	Gray	Ivory	Black	Gray
Use	weight saving	○	○	○	×	×	○	×			
	insulation	○	○	○	×	×	○	×			
	Vacuum Chuck	×	○	○	○	○	○	○			
	filter,rectifier,jet	×	○	○	○	○	○	○			

※AZPW-45 Thermal conductivity is for reference
※Reflection rate differs according to wave length of the light.Please contact us for further information.

Our History



1981 Asuzac founded as Akita Laboratories
1982 First Materials Center is added
1983 Second Materials Center is added
1985 Sales of fine ceramics for the semiconductor industry begins
Japan's first single-part wafer hands with adhesive-free integrated vacuum chamber are produced
Molding and thin-sheet ceramics production begins
1986 Third Materials Center is added
1989 Machining Center is built
1997 Company name is changed to Asuzazc Fine Ceramics Division
2000 Asuzac expands to Ho Chi Minh City in Vietnam
2005 ISO 14001 Certification is acquired
2016 Inspection and Cleaning Center is built

ISO 9001 Certified

Materials Center

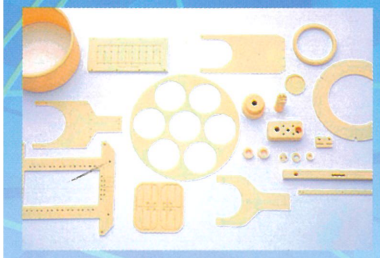
Machining Center

Inspection and Cleaning Center

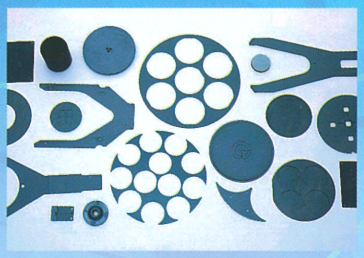
Vietnam Factory
VSIP
(Vietnam Singapore Industrial Park)
ISO 9001 Certified

ASUZAC enables the evolution of industrial technology with our advanced ceramic material capabilities.

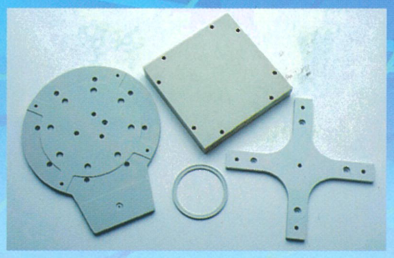
At ASUZAC, we have contributed to the dynamic development of industrial technology by honing the fine ceramics materials required by a wide range of industrial applications. We endlessly innovate to unleash the potential that ceramics possess, such as strength, durability, heat and chemical resistance, and electrical properties surpassing those of metal.



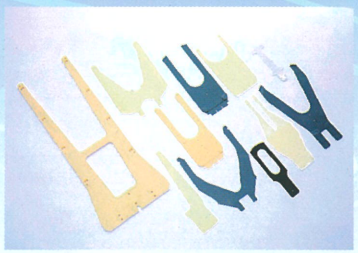
Alumina



Silicon Carbide

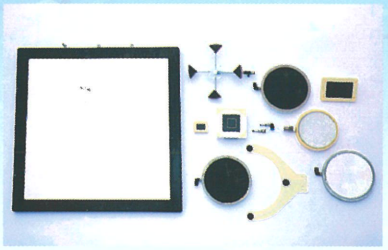


Alsima

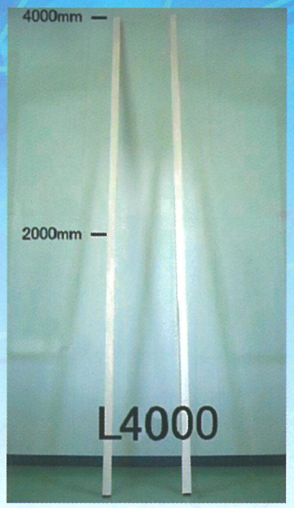


Transport arms

Vacuum hands with built-in inner channel



Porous chucks



Parts up to 4 meters in length (160 inches)

ISO 9001
JCQA-1769

ISO 14001
JCQA-E-0932

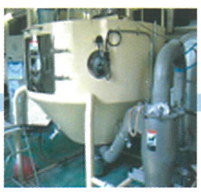
» Manufacturing Process

From the mixing of raw material to molding, sintering, machining, inspection, and shipping, we utilize a comprehensive in-house production process to deliver fine ceramic parts of unparalleled quality.

01 Mixing

Ball Mill

02 Powder Creation



Spray Dryer

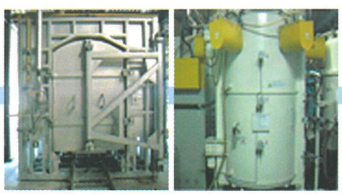
03 Molding

CIP

04 Green Machining

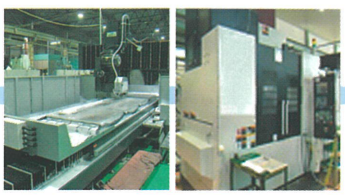
NC Router

05 Sintering



Sintering Furnaces

06 Final Machining



Surface Grinder

Machining Center

07 Inspection

CMM

08 Cleaning, Packing, Shipping

Automated Cleaning Machine

ASUZAC Inc.

Fine Ceramics Division

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