



精密セラミックス Fine Ceramics



棕茂科技股份有限公司
COALITION TECHNOLOGY CO., LTD



精密陶瓷、生醫陶瓷、紅&藍寶石、特殊陶瓷材料 專業製造廠
Professional Manufacturer of Fine Ceramics ,Bio Ceramics,
Sapphire & Ruby, Special Materials.

本社-台中總公司
Taichung Head Office



南科分公司&工場
Tainan Office & Factory
(Southern Taiwan Science Park)



新竹營業所&工場
HsinChu Office & Factory



棕茂科技股份有限公司
COALITION TECHNOLOGY CO., LTD

Main Product 重要取扱製品

一、Fine Ceramics ファインセラミックス	材質(Material)
1) Structural Ceramic セラミックスの応用製品 a、Semiconductor, Photonics, Electronics, and Optic 半導体、光電、電子、光学 b、Mechanical 機械用 c、Fine Ceramics Ball ファインセラミックス球 d、Bearing for Special Environment 特殊環境ベアリング e、Ceramic Ball Valve セラミックボールバルブ 2) Porous Ceramic 多孔性セラミック a、Ceramic Cutting Table セラミックカッティングテーブル b、Ceramic Vacuum Chuck セラミックバキュームチャック c、Honey Comb Ceramic 蜂の巣状 セラミック d、Ceramic Filter セラミックフィルター 3) Refractory Ceramic 耐熱セラミック 4) Machinable Glass Ceramic マシナブルガラスセラミック	(1) Alumina (Al₂O₃) アルミナ *Al ₂ O ₃ >85% *Al ₂ O ₃ >92% *Al ₂ O ₃ >96% *Al ₂ O ₃ >99.5% *Al ₂ O ₃ >99.9% (2) Zirconia (ZrO₂) ジルコニア *Y ₂ O ₃ -ZrO ₂ *MgO-ZrO ₂ *CeO ₂ -ZrO ₂ (3) Silicon Nitride(Si₃ N₄) 窒化珪素 (4) Aluminum Nitride (AlN) 窒化アルミニウム (5) Boron Nitride (BN) 窒化ホウ素 (6) Silicon Carbide (SiC) 炭化珪素 (7) Boron Carbide (B₄C) ボロンカーバイド (8) BN+ Si₃N₄ (or AlN) (9) BN+ EC ボロンカーバイド+EC (10) Silicon Dioxide (SiO₂) 二酸化珪素
二、Thermal Spraying & PVD & CVD for Ceramic & Hard-Facing Alloy セラミックと硬合金のPVD & CVD & 塗装スプレー	Al ₂ O ₃ , ZrO ₂ , Y ₂ O ₃ , Cr ₂ O ₃ , Al ₂ O ₃ -TiO ₂ , WC, Al,...

Additional Product その他の取扱製品

1) Quartz 石英	GE124, GE214, GE224,...
2) Sapphire & Ruby サファイアとルビー	
3) Graphite 黒鉛	
4) Silicon 珪素 シリコン	
5) Metal & Supper Alloy 精密金属加工品	W, WC, Ni-alloy, Co-alloy, SUS, Al, Mg-alloy,...
6) Engineering Plastics 精密樹脂加工品	PVDF, PTFE, PEEK, Vespel, PAI, PBI,...

精密陶瓷、生醫陶瓷、紅&藍寶石、特殊陶瓷材料 專業製造廠
 Fine Ceramics、Bio Ceramics、Sapphire & Ruby、Special Material、
 Professional Manufacturer



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 COALITION TECHNOLOGY CO., LTD

RESEARCH&DEVELOPMENT



證書編號：89Q10268



證書編號：TW12/11991



證書編號：TW12/11992



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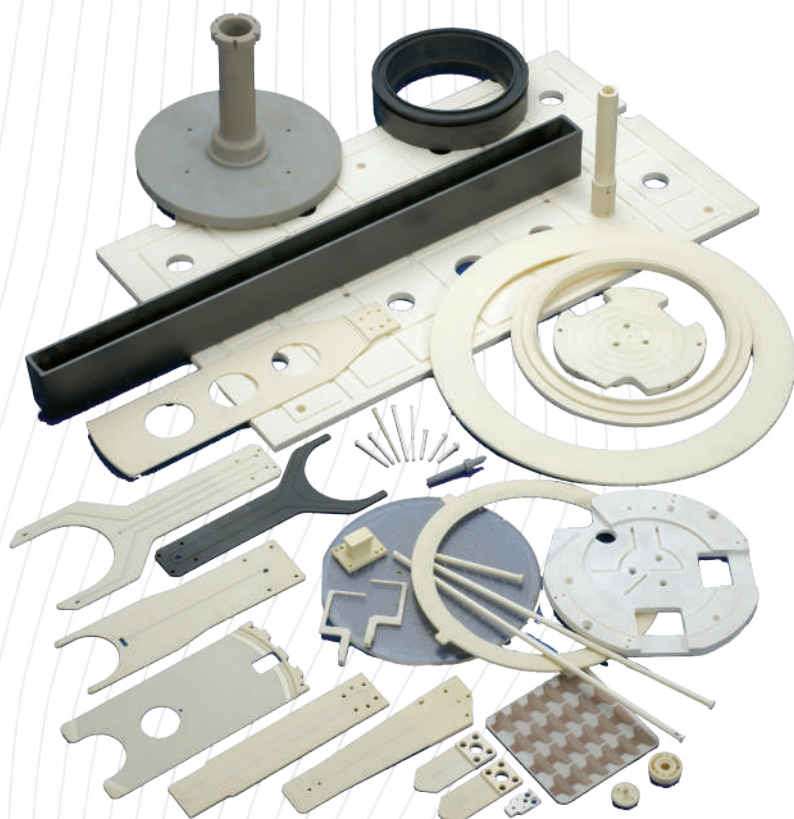
ABOUT



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COALITION TECHNOLOGY CO., LTD

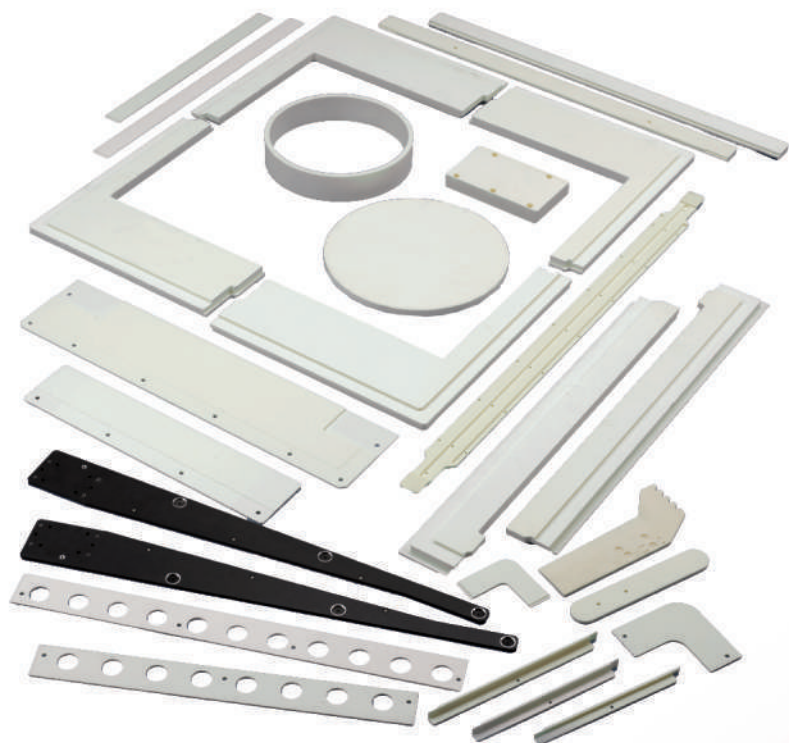


- Spare parts for equipment in semi-conductor, photonic, electronic and optic industry



大型精密陶瓷

LARGE SIZE FINE CERAMICS



● Al_2O_3
氧化鋁

● ZrO_2
氧化鋯



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COALITION TECHNOLOGY CO., LTD

機械業相關零組件



● Mechanically loaded parts



超精密加工件

EXTREMELY SMALL AND
PRECISELY MACHINED PARTS

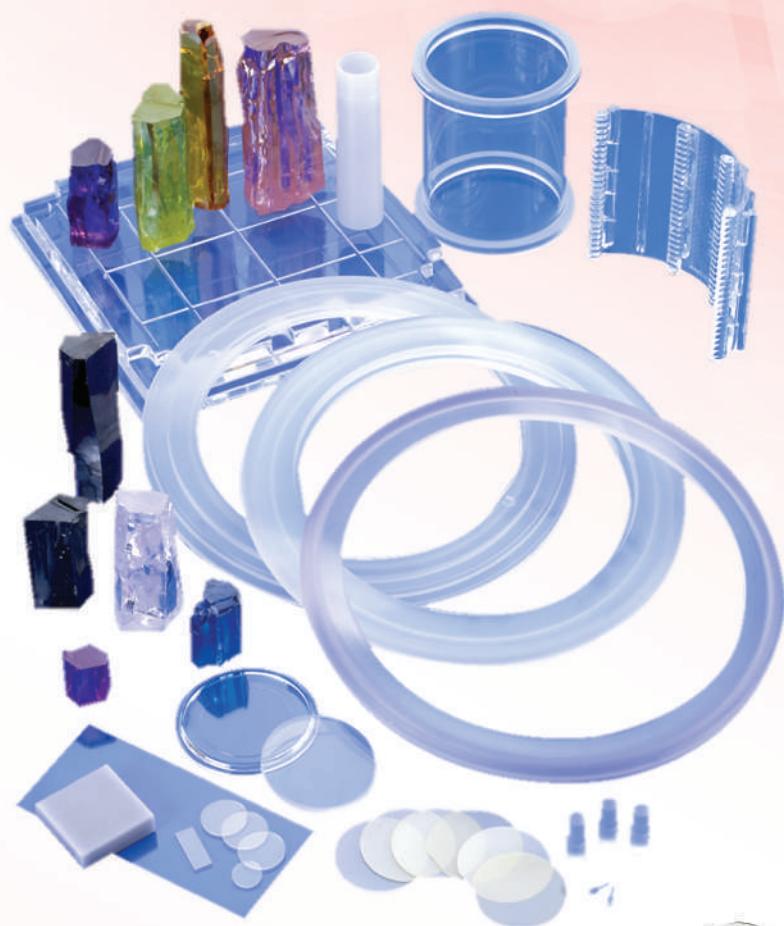
Close Up (> 0.02mm)



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QUARTZ
SAPPHIRE
RUBY
CUBIC ZIRCONIA

石英、藍寶石、紅寶石、鋯寶石

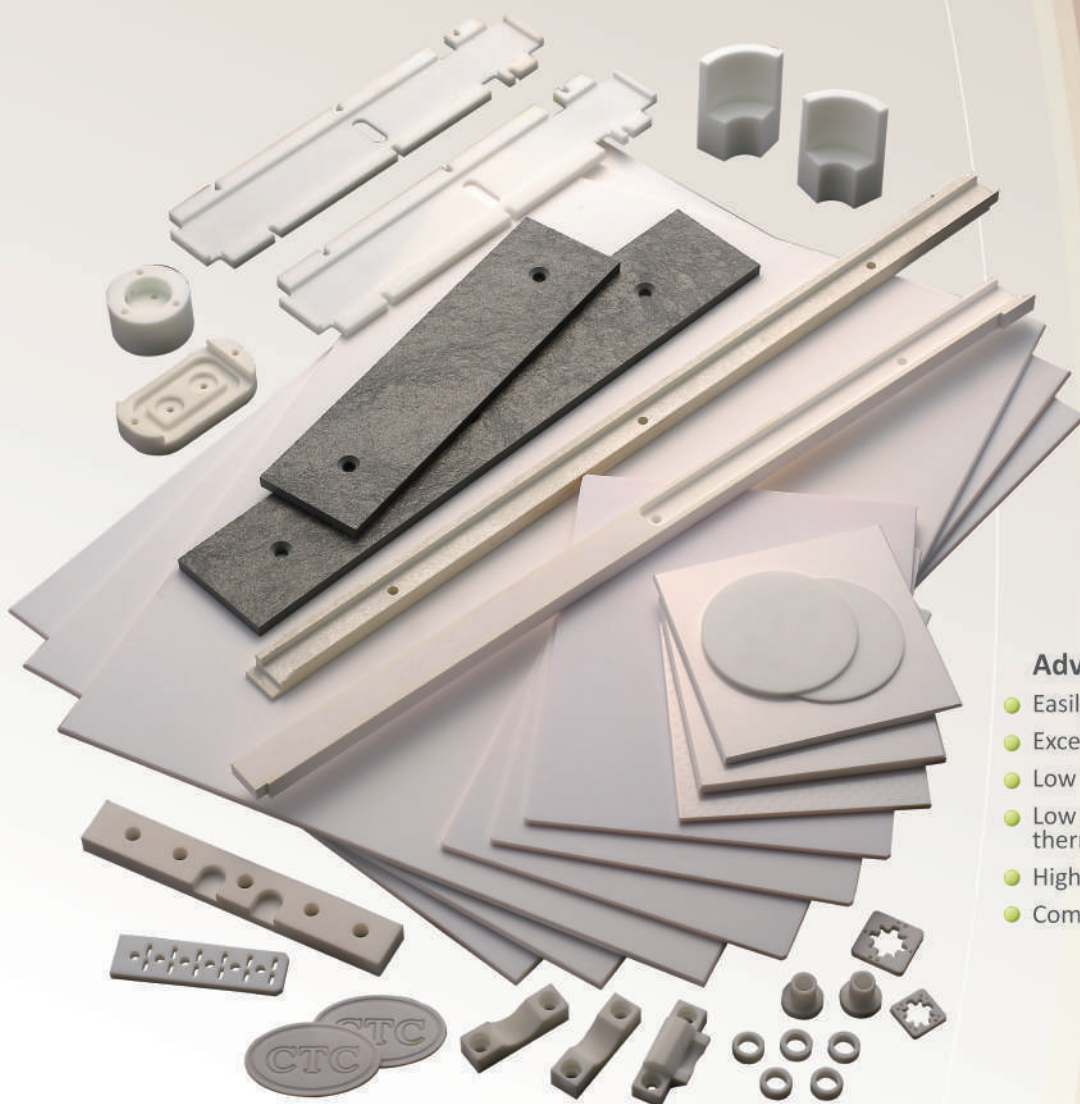


可加工陶瓷

MACHINABLE CERAMICS

- Boron Nitride(BN)
- Glass-Mica Ceramic
- Machinable Glass Ceramic

- Aluminum Silicate
- Quartz Ceramic
- MACOR



Advantages:

- Easily machined
- Excellent thermal shock resistance
- Low thermal expansion
- Low thermal conductivity, excellent thermal insulator
- High arc resistance
- Complex design flexibility



棕茂科技股份有限公司
COALITION TECHNOLOGY CO., LTD

● Ceramic Ball Valves
陶瓷球閥門

● Bearings for Special
Environments
特殊環境用軸承

● Fine Ceramic Balls
精密陶瓷球



精密陶瓷球

FINE CERAMIC BALLS

Base Material : (1) Si₃N₄ (2) ZrO₂ (3) Al₂O₃

※精密陶瓷球之等級及公差 Fine Ceramic Ball Grades and Tolerances:

Grade	Sphericity	Basic Diameter Tolerance	Maximum Surface Roughness(Ra)
3	.000003"	+/- .00003"	0.012
5	.000005"	+/- .00005"	0.02
10	.000010"	+/- .0001"	0.025
16	.000016"	+/- .0001"	0.032
25	.000025"	+/- .0001"	0.05
50	.000050"	+/- .0002"	0.08
100	.0001"	+/- .0005"	0.125
200	.0002"	+/- .0010"	0.2
500	.0005"	+/- .002"	-
1000	.001"	+/- .005"	-

精密陶瓷球之規格

Specifications of Fine Ceramic Balls

規格(Type)		規格(Type)		規格(Type)	
mm (millimeter)	in (inch)	mm (millimeter)	in (inch)	mm (millimeter)	in (inch)
0.8		7.5		16	
1		7.9375	5/16	17	
1.2		8		17.46	11/16
1.5		8.5		18	
1.5875	1/16	8.7312	11/32	19.05	3/4
2		9		20	
2.3812	3/32	9.5		20.64	13/16
2.5		9.525	3/8	21	
3		10		22	
3.175	1/8	10.3188	13/32	22.22	7/8
3.5		11		23	
3.9688	5/32	11.1125	7/16	23.81	15/16
4		11.5		24	
4.5		11.5094	29/64	25	
4.7625	3/16	11.9062	15/32	25.4	1
5		12		26.9875	1 ¹ /16
5.5		12.3031	31/64	28.575	1 ¹ /8
5.5562	7/32	12.7	1/2	30	
5.9531	15/64	13		30.1625	1 ³ /16
6		13.4938	17/32	31.75	1 ¹ /4
6.35	1/4	14		33.3375	1 ⁵ /16
6.5		14.2875	9/16	34.925	1 ³ /8
6.7469	17/64	15		35	
7		15.0812	19/32	36.5125	1 ⁷ /16
7.1438	9/32	15.875	5/8	38.1	1 ¹ /2

Available sizes:φ0.2~φ60mm

Note:Non-standard ceramic ball orders to specification arranged by customers are also welcomed.



棕茂科技股份有限公司
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● DBC Substrates
基板

● Metallized Ceramic
陶瓷金屬化

● Ceramic Cutting Table
&
Vacuum Chuck

陶瓷切割盤
與
陶瓷真空盤

陶瓷飾品

CERAMIC FASHION ACCESSORIES



- Necklace
項鍊
- Bangle
手鐲
- Watchstrap
錶帶
- Button
鈕扣
- Buckle
皮帶扣

軍用精密陶瓷

- Armor Tiles
陶瓷抗彈板
- Body Armor
防彈護甲
- Bulletproof Helmet
防彈頭盔

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Products

「精密陶瓷 & 特殊材料」之精密零組件「專業設計、製作、行銷」



棕茂科技股份有限公司
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生醫科技用精密陶瓷

Bio-Ceramics for Medical Materials
Biokeramik für Medizinische Anwendungen
医療応用のバイオ・セラミックス

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Product

「精密陶瓷 & 特殊材料」之精密零组件「專業設計、製作、行銷」

Bioceramic Products Produktliste Biokeramik バイオセラミック製品

1. Zirconia Ceramic Blank Zirkonoxidrohlinge ジルコニア セラミックブランク

a. White Grades

- i. Standard
- ii. High Translucent
- iii. Super Translucent

b. Pre-colored Grades

- i. High Translucent
- ii. Super Translucent

c. Gradient Grades

- i. High Translucent
- ii. Super Translucent

2. Ceramic Abutment Keramikaufbauten アパットメント

3. Ceramic Implants Keramische Implantate セラミック インプラント

4. Ceramic Surgical Appliances Keramische Chirurgische Hilfsmittel セラミック製手術器具

5. Ceramic Parts for Medical Equipment Keramische Komponenten für medizinische Geräte セラミックの医療機器用部品

- | | | |
|-------------|------------|-------|
| a. Zirconia | Zirkonoxid | ジルコニア |
| b. Ruby | Rubin | ルビ- |
| c. Quartz | Quarz | 石英 |

6. Ceramics for Wellness Applications Keramik für Wellnessanwendungen 健康増進応用セラミック

- a. FIR Emitting Ceramics
- b. Anion Releasing Ceramics

7. Bone Cement Knochenzement 骨セメント



棕茂科技股份有限公司
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陶瓷、超硬合金、石墨、PBN

● Thermal Spraying

HVOF
PLASMA
ARC

● PVD

● CVD

for

● Ceramics

● Super Hard-facing Alloy

● Graphite

● PBN



1.SEMICONDUCTOR INDUSTRY

- thermal insulator for lithography equipment
- high temperature IC testing sockets
- thermal shield for PC board
- vacuum chuck component
- iR lamp socket in epitaxial reactor
- stepper holder & spin chuck for photo process
- focus ring & clamp ring for etch process
- plasma etch chamber components
- susceptor and guide ring for CVD process
- water-handing components for CVD and MOCVD
- vacuum tweezers & furnace arm for diffusion process
- water boat, polishing, platters & carries
- sputtering / RTP/ epi rings / crucible /jigs /heater
- shadow frame & shaft for LCD process /bonding stages
- windows / gas distribution

2.MICROELECTRONIC INDUSTRY

- mirrors for surveillance & mirror / high-energy lasers / laser radar systems
- laser absorbers / synchrotron x-ray and VUV telescopes
- large astronomical telescopes / weather satellites / microwave components

3.ELECTRONIC ACCESSORIES INDUSTRY

- HPLC lamp holder / RF insulator / bobbin coil support
- mass spec. filament bases/ quadrapole /gas flow-meter sensor mount
- pressure transducer component / micro motion sensor component

4.MEDICAL MATERIAL INDUSTRY

- dental crown, dental implant, surgical appliances
- high frequency insulators for surgical devices
- non-fluorescent wafers for DNA-testing equipment
- heat transfer regulator for respiratory mask

5.MILITARY /NAVIGATION TECHNOLOGY INDUSTRY

- armor tiles/ body armor / bulletproof helmet
- aircraft light connector & lamp socket

- guidance system: pocket –cell
- breaking systems: thermal insulator
- GPS components / thermocouple terminals
- switch gear / high intensity light focusing structure
- radar window

6.EQUIPMENT INDUSTRY

- bearing / mechanical seal / machine components and assemblies
- nozzle / gages, beams and guide rails /shafts, sleeves and tubes
- roller and dies / automotive / wear components

7.FASHION ACCESSORIES

- necklace/ bangle / watchstrap / button / buckle

8.PETROCHEMICAL INDUSTRY

- stand off in PTFE CVD chamber / igniter insulator for H2 combustion
- carburization: graphite support / corona treating: hi voltage insulator

9.POWER-STATION

10.INCINERATOR

11.IRON AND STEEL INDUSTRY

12.ELRCTRIC CABLE, ELRCTRIC WTRE & ELRCTRIC CODE INDUSTRY

13.TEXTILE INDUSTRY

14.PAPER INDUSTRY

15.MINERAL AND CEMENT INDUSTRY

16.AUTOMOBILE INDUSTRY

17.RUBBER AND PLASTIC INDUSTRY

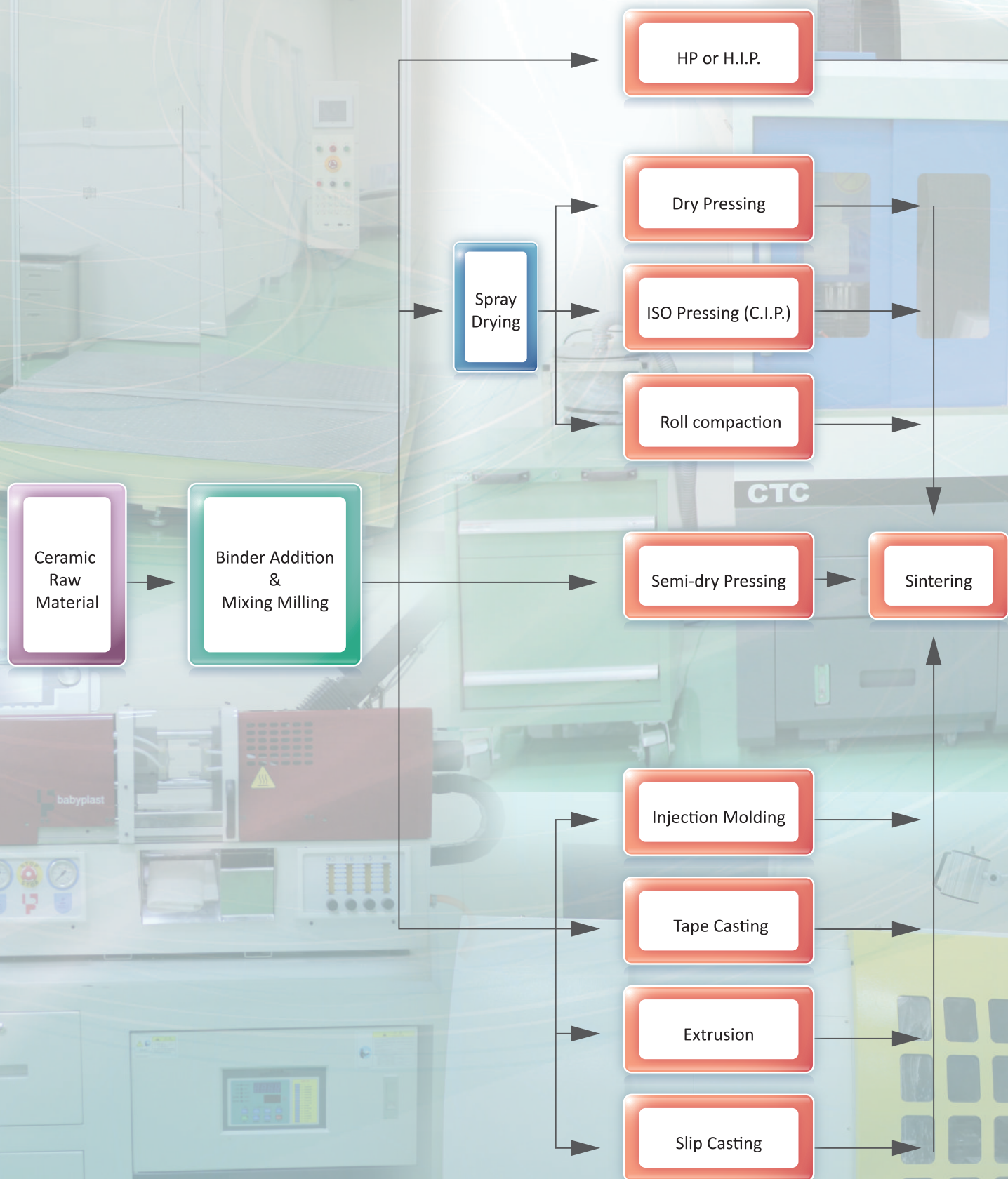
18.FOOD PROCESSING

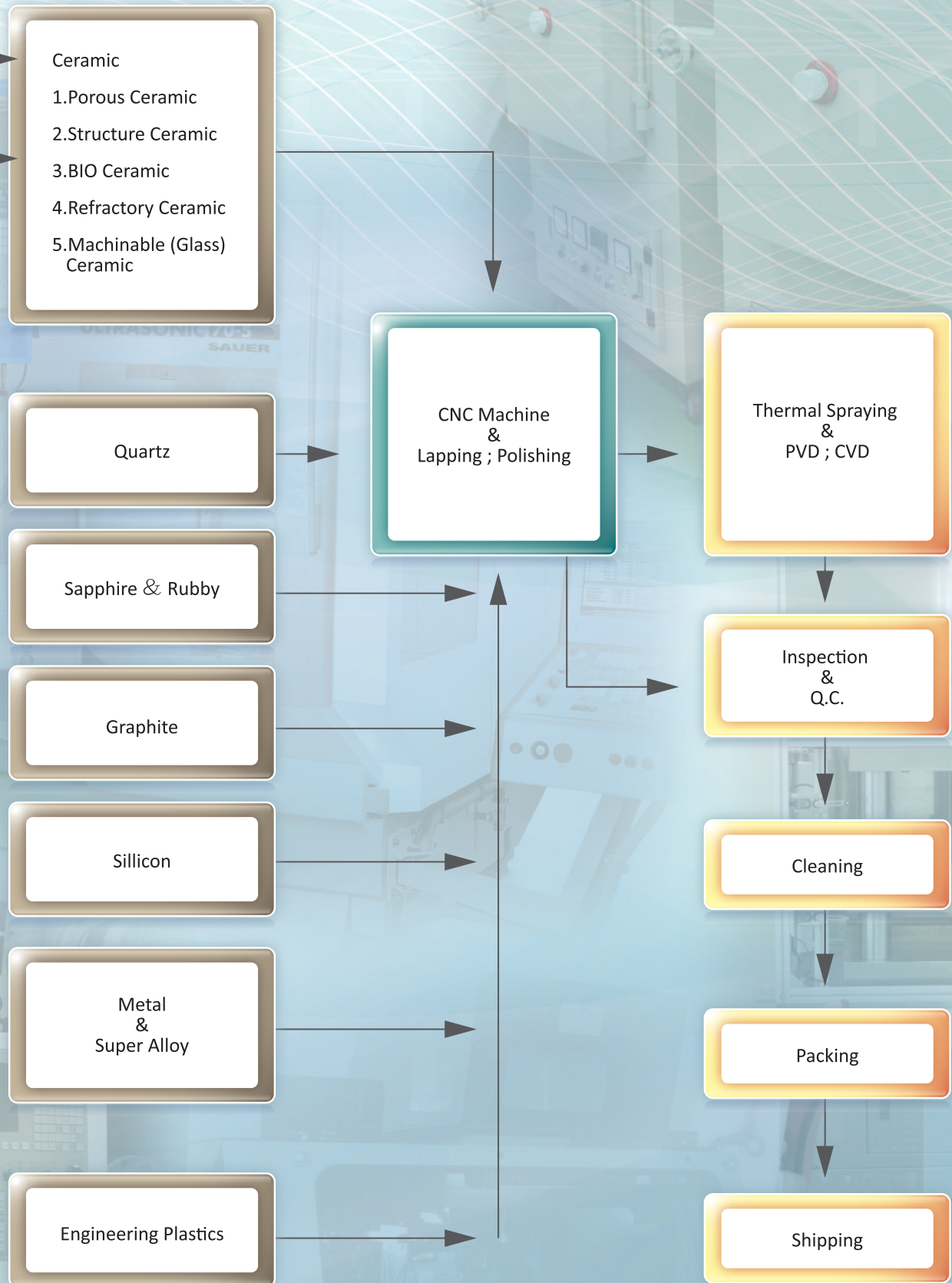
- micro-wace transparent plates
- electrical oven: high temperature electrical connector

19.OTHERS

- railway equipment
- induction heaters: thermal insulator
- plastic bag sealing jaw
- cryogenic insulator
- glass handling jigs and fixtures

CERAMIC MANUFACTURING PROCESS





Fine Ceramic

Properties		Units	Alumina (Al ₂ O ₃)								Zirconia (ZrO ₂)			
			Porous		Mullite	Al ₂ O ₃ 85%	Al ₂ O ₃ 92%	Al ₂ O ₃ 96%	Al ₂ O ₃ 99.5%	Al ₂ O ₃ 99.8%	ZrO ₂ -Al ₂ O ₃	Y ₂ O ₃ -ZrO ₂ 3Y-TZP	Y ₂ O ₃ -ZrO ₂ 8Y-PSZ	Mgo-ZrO ₂
			Al ₂ O ₃ + Mullite	Al ₂ O ₃										
Mechanical	Density	g/cm ³	2.0-2.5	3.0-3.5	2.8	3.4	3.6	3.7	3.9	3.92	4.05	>6.0	5.7	5.6
	Color	—	—	—	Tan	White	White	White	Ivory/ White	Ivory	White	Ivory/ White	Ivory	Yellow/ Ivory
	Water Absorption	%			0	0	0	0	0	0	0	0	0	0
	Hardness	Gpa	—	—	7.4	9.5	11	11.5	14.1	14.0-15.0	16	12.7	6.4	12
	Flexural Strength (20°C)	Mpa	150-200	50-100	170	300	345	358	380	400	400	900	280	650
	Compressive Strength (20°C)	Mpa	30-100	20-100	550	1950	2200	2300	3000	3150	2500	2500	1780	1800
Thermal	Thermal Conductivity (20°C)	W/m ² ·k	1.5	3.1	3.5	16.0	16.7	24.8	25-35	30	20	2	2.5	2
	Thermal Shock Resistance (20°C)	ΔT(°C)	—	—	300	300	250	250	200	200	300	250	500	375
	Maximum Use Temperature	°C	1600	1900	1700	1400	1500	1600	1700	1700	1600	1000	2400	1000
Electrical	Volume Resistivity (25°C)	Ω-cm	>10 ¹³	—	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴	10 ¹²	10 ⁹	10 ⁸	10 ¹⁰

Machinable Ceramic

Properties		Unit	Boron Nitride (BN)						Macor MGC-1	
			BN AX05		BN NB-1000		BN HP			
Mechanical	Density	g/m ³	1.9		1.6		1.9		2.52	
	Color	—	White		White		White		Ivory/White	
	Porsity	%	14.2		14		15		0	
	Flexural Strength (20°C)	Mpa	22		25		50		105	
	Compressive Strength (20°C)	Mpa	—		—		—		345	
Thermal	Thermal Conductivity (20°C)	W/mk	100		60		30		1.46	
	Coefficient of Thermal Expansion	x10 ⁻⁶ /°C	25 1500°C	0.6	25 1500°C	0.3-1.0	25 1500°C	0.9-3.0	25 300°C	9.3
	Maximum Use Temperature(in Vacuum)	°C	2000		2000		1100		1000	
Electrical	Volume Resistivity (25°C)	Ω-cm	>10 ¹⁴		>10 ¹⁴		>10 ¹⁴		>10 ¹⁴	
	Arc Resistance	Seconds	—		—		—		—	

Silicon Carbide (SiC)						Silicon Nitride (Si ₃ N ₄)			Aluminum Nitride (AlN)		Graphite	Quartz	Sapphire
ReSic	RSSC	SSC	HPSC	CVD SC		RBSN	SSN	HPSN	SAIN	HPAIN			
2.6	3.0-3.1	3.2	3.15-3.2	3.2		2.3	3.2	3.3	3.3	3.26	1.57-1.88	2.2	3.97
Black	Black	Black	Black	Black		Gray	Gray	Gray	Gray	Black	Black	White/ Transparent	White/ Transparent
16%	0	0	0	0		0	0	0	0	0	0.3-3.0	0	0
—	23.5	24	24	24.5		12.7	14	14	10.5-11.5	10.5-11.5	7-7.5	11.5-13.5	18.5-21.5
>100	460	480	380-460	375		190	700-800	700-950	260	200-300	50	80	760-1050
—	2500	3200	3500	3500		2500	3200	3200	—	—	100-200	650-1100	2000
24	125	150	60-115	300		14	26-42	35-42	170-190	180-200	95	1.4	40
—	400	300	400	400		330	530-610	540-650	400	400	200-250	—	—
1650	1400	1700	1750	1750		1400	1400	1400	1600	1600	—	1200	2000
—	<10 ³	10 ² -10 ⁶ 10 ⁶ -10 ⁹	10 ⁰ -10 ⁷	10 ⁰ -10 ³		>10 ¹²	>10 ¹²	>10 ¹²	>10 ¹⁴	>10 ¹⁴	0.3-1.0X10 ⁻³	7X10 ⁷	10 ¹⁶

Machinable Glass Ceramic				Glass-Mica							
CTC MGC-2		CTC MGC-3		MM 1600		MM1100		MM500		MM400	
>2.5		>1.8		2.7		2.8		2.7		2.5	
Ivory/White		White		Off-white		Green		L-Gray		D-Gray	
0		<15		0		0		0		0	
108		120		93		76		86		90	
488		>55		276		220		276		310	
1.68		0.66		1.02		1.32		1.15		0.87	
25 300°C	8.6	0.9		@ 25°C @ 350°C @ 500°C	8.7 - 9.3	@ 25°C @ 350°C @ 500°C	10.5 9.8 9.4	@ 25°C @ 350°C @ 500°C	11.6 10.6 -	@ 25°C @ 350°C @ 500°C	13 11 -
1000		1550		870		600		400		400	
>10 ¹⁴		>10 ¹²		2.6x10 ¹⁵		10 ¹²		10 ¹⁴		10 ¹⁰	
—		—		300		345		260		245	





棕茂科技股份有限公司

COALITION TECHNOLOGY CO., LTD

誠信
Integrity

品質
Quality

服務
Service

信賴感 品質 サービス

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