

CSCC

Graphite Block Introduction



CSC GROUP

中鋼集團

China Steel Chemical Corporation



Company Profiles

China Steel Chemical Corporation:

- ◆ Total capital **80M USD**
- ◆ **1989** Established
- ◆ Around 250 employees, **R&D~30**
- ◆ **1997** ISO 14000 certified
- ◆ **2002 MCMB Anode Mass Production**
- ◆ **2002** ISO 9001:2000 & OHSAS 18001 certified
- ◆ **2013** IATF 16949 certified
- ◆ **2014** Branch established in Chang Zhou
- ◆ **2014 ACS Mass Production**
- ◆ **2018 Carbon Material Manufactory established in Ping Nan**



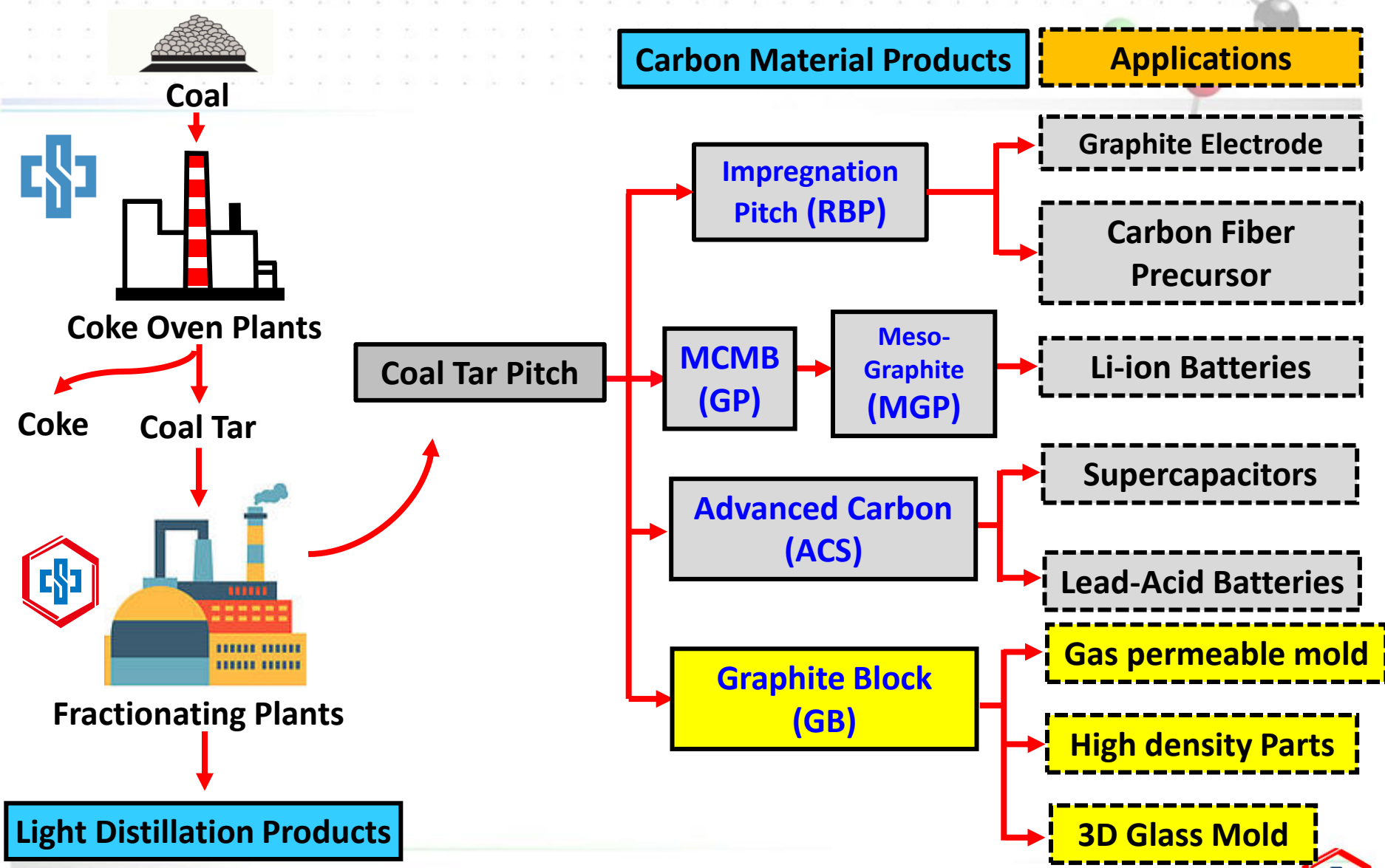
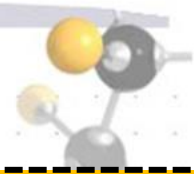
Parent Company

China Steel Corporation:

- ◆ Total capital **5B USD**
- ◆ **No. 1 steel supplier in Taiwan**
- ◆ Around 9000 employees, R&D >300
- ◆ High quality steels for vehicles
- ◆ Supply to famous automotive companies



Carbon Material Flow Chart



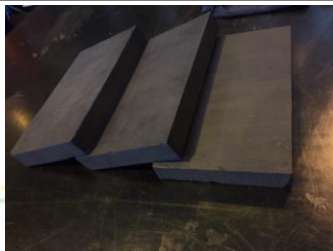
Advantages of Self-sintering process



Specification of GB Series



ITEM	Unit	GBE1	GBM1	GBM7
Density	g/cm ³	>1.80	>1.90	>1.80
Bending Strength	MPa	>35	>45	>35
Compression strength	MPa	>70	>90	>70
Coefficient of thermal expansion	*10 ⁻⁶ /K	4~6	4~6	4~6
Hardness Shore	-	>55	>70	>55
Average particle size	μm	10	4	4
Max. Size	mm	300*300*100 φ200*H300	230*150*70	300*300*100 φ200*H300
Characteristic		High permeability, High thermal conductivity	High Density, Ultrafine particles	Ultrafine particles, good machinability



➤ Part of the physical properties can be adjusted according to customer's needs.



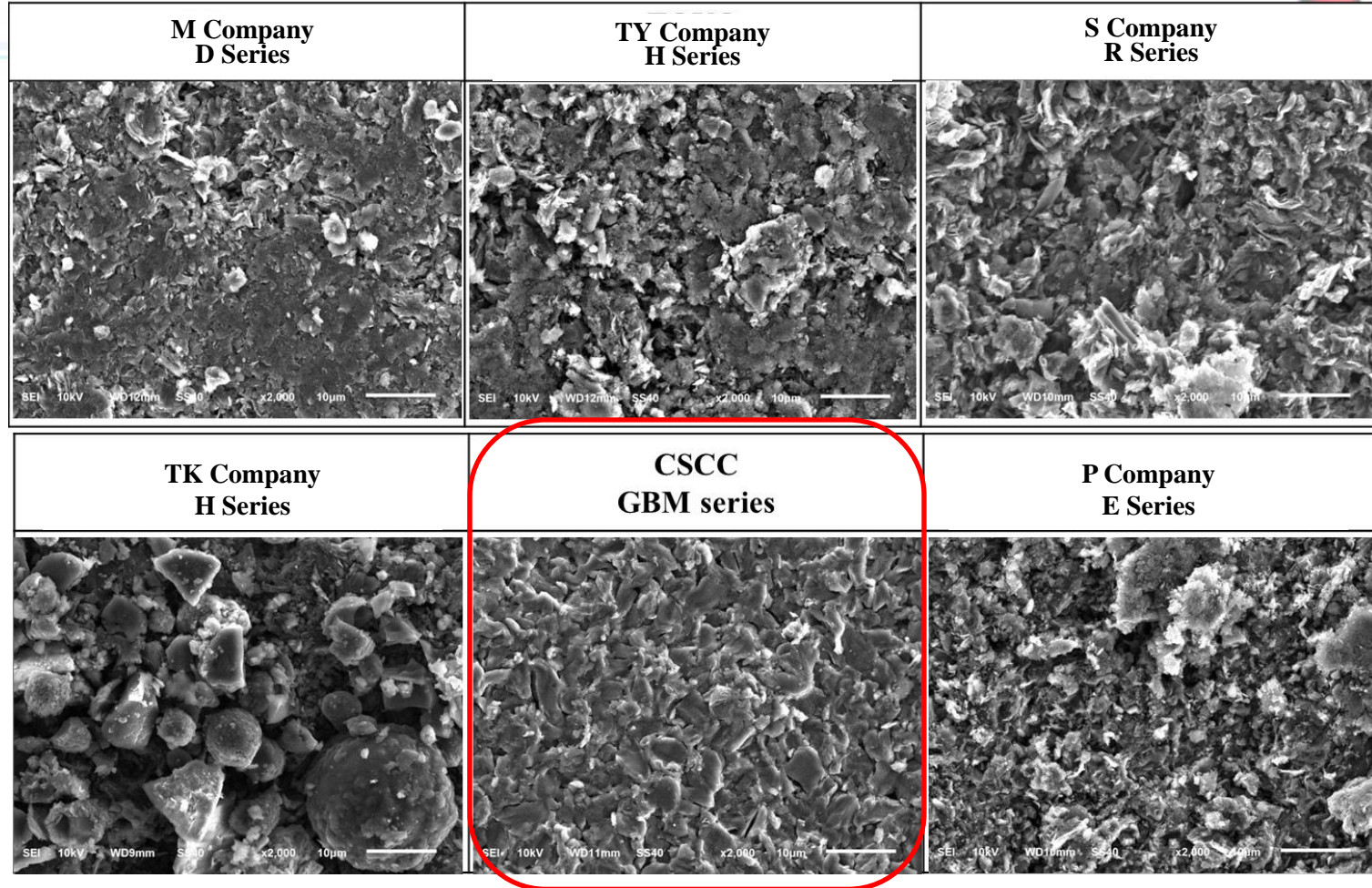
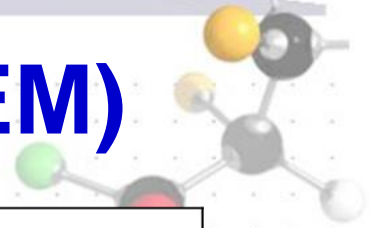
Comparison of Competitor



Properties	P Company E Series	M Company D Series	TY Company H Series	S Company R Series	TK Company H Series	CSCC GBM1
Density (g/cm ³)	1.75	1.84	1.75	1.75	1.80	1.95
Hardness Shore	76	79	82	72	81	76
Bending Strength (MPa)	90	65	73	85	71	64
Compression strength (MPa)	171	135	137	150	133	135
Coefficient of thermal expansion (10 ⁻⁶ /K)	7.6	5.2	5.1	4.7	4.1	4.6
Particle Size of raw material (μm)	4~5 (by SEM)					

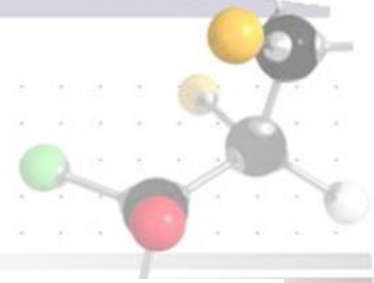


Comparison of Surface (SEM)



➤ GB series have small particle size and fine structure.

Oxidation threshold test



- Sample Size : 0.5*0.5*1 inch. Air oxidation at fixed temperature for 24 hours.

Sample	P Company E Series	P Company E Series-2	TK Company H Series	CSCC GBM1
Wt loss% @450°C	0.03	0.05	2.50	0.09
Wt loss% @500°C	0.14	0.15	16.58	1.01
Wt loss% @550°C	0.91	0.99	93.48	9.78

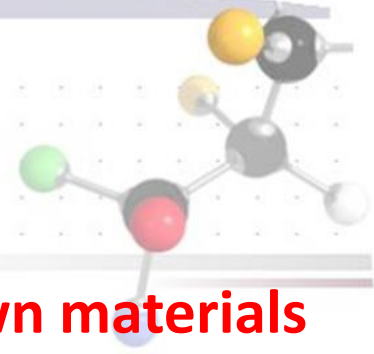
Reference

P Company's Grade	A Series	B Series	C Series	D Series	E Series	F Series
Temperature of 1% Weight loss by oxidation(°C)	450	560	470	580	450	560

- **GBM1 have better anti-oxidative capacity than TK company & P Company A/C/E Series.**



Conclusion



1. CSCC has developed isotropic graphite block by **own materials** and **technology of process**.
2. Compared with the traditional process, the self-sintering process can **save more time** of production.
3. GB series products have **high strength, fine structure** and **high density**. Compared with other commercial product, GB series have **high purity without purification process (<200ppm)** and **anti-oxidative capacity**.



Thanks for Your Attention