Silica fume

Silica fume is a byproduct gained by collecting exhaust gas generated in the process of refining ferrosilicon, metal silicon, electromelting zirconia, etc. These spherical superfine particles consist primarily of non-crystalline silicon dioxide (SiO_2), and the average particle diameter of each primary particle is approximately 0.1 to 1.0 μm.

Characteristics

○ Microfiller effect 〉 By adding the superfine particles of silica fume to cement and other materials, the gaps between the particles are filled. This effect achieves the production of dense, high-strength products.

○ Ball bearing effect 〉 Silica fume improves the flowability and workability of cement. This effect reduces the unit water amount required for achieving the specific flowability.

○ Pozzolan reaction 〉 Soluble silica reacts with calcium hydroxide to produce a water-insoluble, curable siliceous compound.The main ingredient of silica fume is non-crystalline SiO2, which reacts with Ca(OH)2 produced by hydration of the cement and produces calcium silicate hydrate (C-S-H). By this reaction, the intensity and the water-tightness of the cement are improved.

Product table (typical values)

Product name		SN-5	FS-A	FS-B
Region of origin		China	China	China
Derivation		Electromelted zirconia	Metal silicon	Metal silicon
Chemical compo-sition (%)	lg.loss	0.43	2.38	1.97
	SiO_2	96.50	93.15	96.32
	Al_2O_3	0.26	0.14	0.21
	Fe_2O_3	0.27	0.06	0.08
	CaO	0.03	0.89	0.22
	MgO	0.02	0.72	0.69
	K_2O	0.10	2.28	0.37
	Na_2O	0.01	0.37	0.13
	TiO_2	0.02	0.01	0.01
	ZrO_2+HfO_2	2.34	–	–
Physical properties	pH	2.75	7.96	3.78
	Wate rcontent(%)	0.61	0.63	0.95
	Whiteness	91.6	48.8	18.70
	Specific surface area (BET method: m2/g)	11.8	17.2	23
	Bulk specific gravity (tap)	0.57	0.51	0.56
	Color	White shades	Gray	Black

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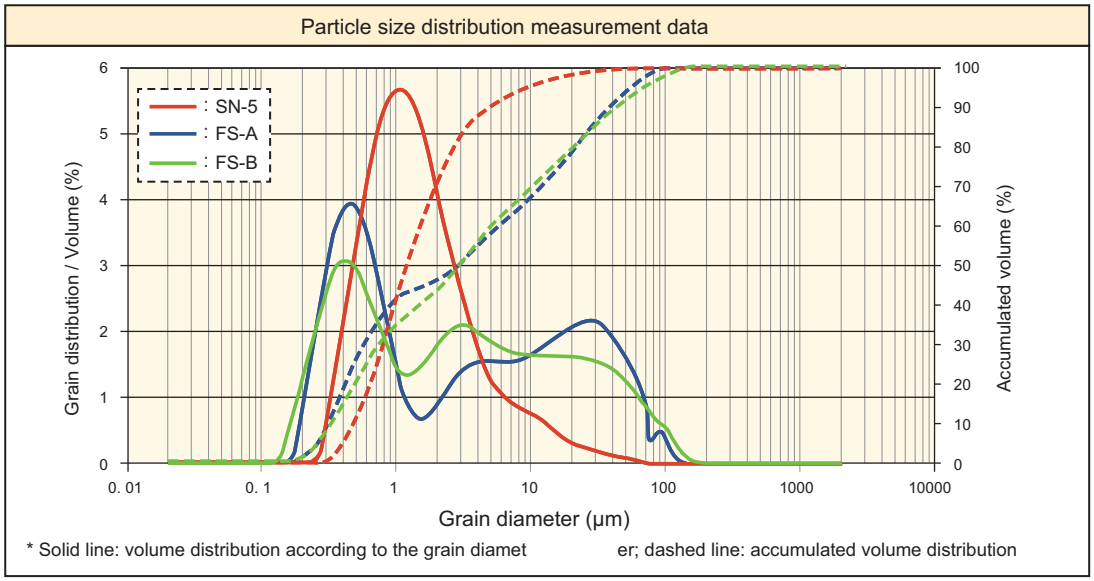
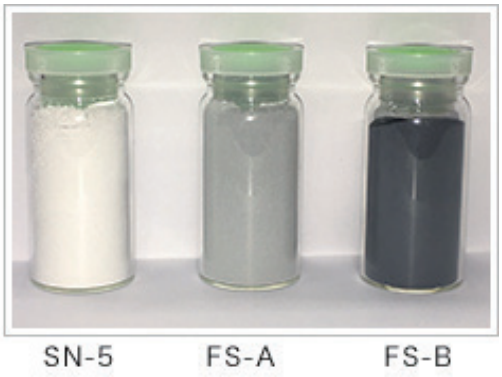
Grain distribution (typical values)



External Appearance



Applications

○ Application to concrete products
Improved water tightness, higher-mechanical strength and reduced rebound amount when spraying
○ Application to unshaped refractories
Improved flowability and higher-mechanical strength
○ Application to hygroscopic materials
Moist absorption and caking prevention of fertilizers and other materials

Delivery formats

○ Flexible containers : 500kg or less (SN-5, FS-A, FS-B)
○ Paper bags : 10 to 20kg (SN-5), 10kg (FS-A, FS-B)

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