



The Association of Powder Process  
Industry and Engineering, JAPAN

# APPIE

# JIS TEST POWDERS

**APPIE distributes the Test Powders suited to JIS Z 8901**

JAPANESE INDUSTRIAL STANDARD JIS Z 8901 defines 28 kinds of powders for industrial testing, such as abrasion or life tests of machinery, performance tests of dust collectors, air filters and fuel or lubricant filters for engine.

APPIE supplies 26 kinds of JIS test powders.

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**Kyoto Office (Head Office)**

No.5 Kyoto Bldg., 181 Kitamachi, Rokujo-agaru,  
Karasuma-dori, Shimogyo-ku, Kyoto, 600-8176, Japan  
Phone: +81-75-354-3583 Fax: +81-75-352-8530  
URL: <http://www.appie.or.jp>

## JIS TEST POWDERS 1 ( JIS Z 8901 )

Class	Material used	Median * diameter $\mu$ m	Particle density g/cm <sup>3</sup>	Chemical ** composition% (mass)
Class 1 Class 2 Class 3	Quartz sand	185 to 200 27 to 31 6.6 to 8.6	2.6 to 2.7	SiO <sub>2</sub> 95 min. Fe <sub>2</sub> O <sub>3</sub> Al <sub>2</sub> O <sub>3</sub> TiO <sub>2</sub> MgO } 5 max. Ign.loss
Class 4 Class 9	Talc	7.2 to 9.2 4.0 to 5.0	2.7 to 2.9	SiO <sub>2</sub> 60 to 63 Fe <sub>2</sub> O <sub>3</sub> 0 to 3 Al <sub>2</sub> O <sub>3</sub> 0 to 3 CaO 0 to 2 MgO 30 to 34 Ign.loss 3 to 7
Class 5 Class 10	Fly ash	13 to 17 4.8 to 5.7	1.95 $\leq$	SiO <sub>2</sub> 45 min. Ign.loss 5 max.
Class 7 Class 8 Class 11	*** KANTO (Japanese) loam	27 to 31 6.6 to 8.6 1.6 to 2.3	2.9 to 3.1	SiO <sub>2</sub> 34 to 40 Fe <sub>2</sub> O <sub>3</sub> 17 to 23 Al <sub>2</sub> O <sub>3</sub> 26 to 32 CaO 0 to 3 MgO 0 to 7 Ign.loss 0 to 4
Class 12	Carbon black	Particle size range Absorbed amount of DBP Adsorbed amount of iodine		0.03 to 0.20 $\mu$ m 25 to 34 ml/100g 22 to 30 mg/g
Class 16 Class 17	Calcium-carbonate (heavy)	3.6 to 4.6 1.9 to 2.4	2.7 to 2.8	CaO 54 to 56 MgO 0 to 3 SiO <sub>2</sub> 0 to 4 Al <sub>2</sub> O <sub>3</sub> 0 to 3 Fe <sub>2</sub> O <sub>3</sub> 0 to 1 Ign.loss 42 to 45

\* Particle size distributions are defined by JIS Z 8901.

\*\* Some deviate from the specifications in JIS Z 8901.

\*\*\* Sintered at 800°C, 2hours.

Note : 1) Class 15 Mixed powder is distributed by the Japan Air Cleaning Association and contains 72% of Class 8, 23% of Class 12 and 5% of cotton linters.

2) Class 13 and Class 14 are now abulent ones.

## JIS TEST POWDERS 2 ( JIS Z 8901 ) ( narrow size distributions )

### Glass beads GBL type

Material used : Soda lime-silicate glass

Particle density : 2.1 to 2.5 g/cm<sup>3</sup>

Refractive index : 1.51 to 1.53

Particle size distribution Unit :  $\mu$  m (mass basis)

Class	Particle size in case of 90% oversize	Particle size in case of 50% oversize	Particle size in case of 10% oversize
GBL 30	26 min.	30 $\pm$ 1.0	34 max.
GBL 40	37 min.	41 $\pm$ 1.0	45 max.
GBL 60	55 min.	59 $\pm$ 1.0	63 max.
GBL 100	95 min.	100 $\pm$ 1.0	105 max.

### Glass beads GBM type

Material used : Barium-titanate glass

Particle density : 4.0 to 4.2 g/cm<sup>3</sup>

Refractive index : 1.92 to 1.94

Particle size distribution Unit :  $\mu$  m (mass basis)

Class	Particle size in case of 90% oversize	Particle size in case of 50% oversize	Particle size in case of 10% oversize
GBM 20	18 min.	22 $\pm$ 1.0	26 max.
GBM 30	26 min.	30 $\pm$ 1.0	34 max.
GBM 40	37 min.	41 $\pm$ 1.0	45 max.

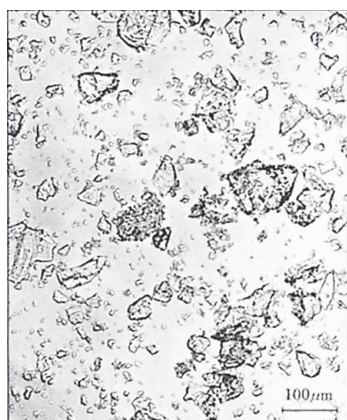
### White fused alumina

Material used : Al<sub>2</sub>O<sub>3</sub> 99% min.

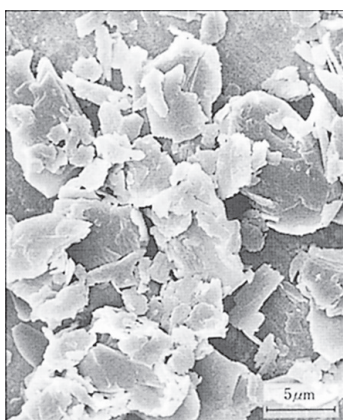
Particle density : 3.9 to 4.0 g/cm<sup>3</sup>

Particle size distribution Unit :  $\mu$  m (mass basis)

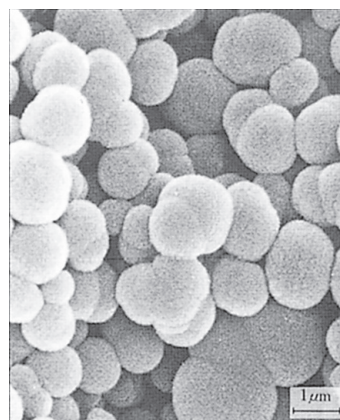
Class	Particle size in case of 94% oversize	Particle size in case of 50% oversize	Particle size in case of 3% oversize
No. 1	0.8 min.	2 $\pm$ 0.45	5 max.
No. 2	2.0 min.	4 $\pm$ 0.5	11 max.
No. 3	4.5 min.	8 $\pm$ 0.6	20 max.
No. 4	9.0 min.	14 $\pm$ 1	31 max.
No. 5	20 min.	30 $\pm$ 2	58 max.
No. 6	40 min.	57 $\pm$ 3	103 max.



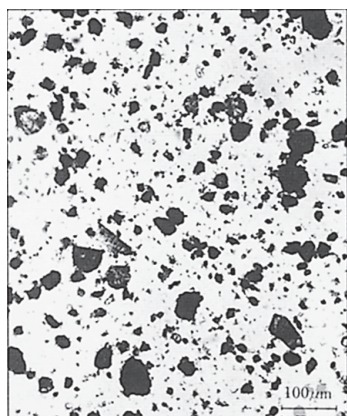
Quartz sand (class 2)



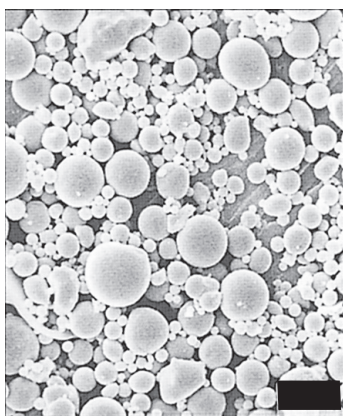
Talc (class 4)



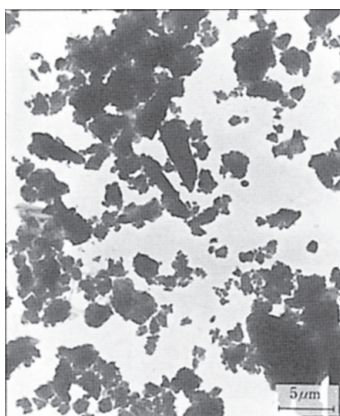
Carbon black (class 12)



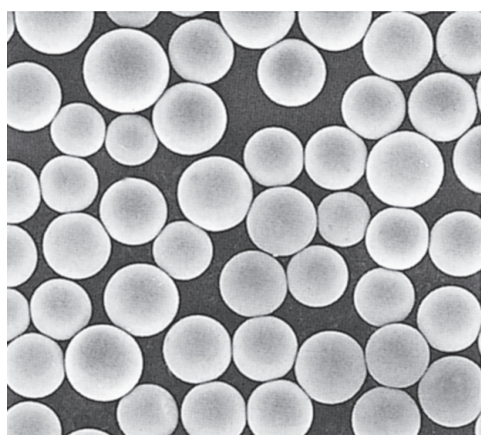
KANTO loam (class 8)



Fly ash (class 5)



Calcium carbonate (class 17)



Glass beads



White fused Alumina

## Microscopic Photographs of JIS TEST POWDERS

## \* Particle size distributions of Test Powders 1

Particle size distribution of  
Class1, Class2 and Class3  
(Quartz sand)

Particle size $\mu\text{m}$	Oversize (On mass basis) %		
	Class1	Class2	Class3
5	-	88 $\pm$ 5	61 $\pm$ 5
10	-	76 $\pm$ 3	43 $\pm$ 3
20	-	62 $\pm$ 3	27 $\pm$ 3
30	-	50 $\pm$ 3	15 $\pm$ 3
40	-	39 $\pm$ 3	9 $\pm$ 3
45	99 min.	-	-
75	90 $\pm$ 3	20 max.	3max.
106	80 $\pm$ 3	-	-
150	65 $\pm$ 3	-	-
212	45 $\pm$ 3	-	-
300	1 max.	-	-

Particle size distribution of  
Class4 and Class9  
(Talc)

Particle size $\mu\text{m}$	Oversize (On mass basis) %	
	Class4	Class9
2	-	79 $\pm$ 5
4	-	55 $\pm$ 5
5	69 $\pm$ 5	-
8	-	23 $\pm$ 5
10	40 $\pm$ 5	-
16	-	6 $\pm$ 3
20	12 $\pm$ 5	-
30	-	-
40	3 $\pm$ 3	-
75	1 max.	-

Particle size distribution of  
Class5 and Class10  
(Fly ash)

Particle size $\mu\text{m}$	Oversize (On mass basis) %	
	Class5	Class10
2	-	82 $\pm$ 5
4	-	60 $\pm$ 5
5	84 $\pm$ 5	-
8	-	22 $\pm$ 3
10	60 $\pm$ 5	-
16	-	3 $\pm$ 3
20	32 $\pm$ 3	-
30	15 $\pm$ 3	-
40	8 $\pm$ 3	-
106	1 max.	-

Particle size distribution of  
Class7, Class8 and Class11  
(KANTO (Japanese) loam)

Particle size $\mu\text{m}$	Oversize (On mass basis) %		
	Class7	Class8	Class11
1	-	-	65 $\pm$ 5
2	-	-	50 $\pm$ 3
4	-	-	22 $\pm$ 3
5	88 $\pm$ 5	61 $\pm$ 5	-
6	-	-	8 $\pm$ 3
8	-	-	3 $\pm$ 3
10	76 $\pm$ 3	43 $\pm$ 3	-
20	62 $\pm$ 3	27 $\pm$ 3	-
30	50 $\pm$ 3	15 $\pm$ 3	-
40	39 $\pm$ 3	9 $\pm$ 3	-
75	20 max	3 max	-

Class12 Particle size range  
 (Carbon black)  
 0.03~0.20  $\mu\text{m}$

Particle size distribution of  
 Class16 and Class17  
 Calcium carbonate (heavy))

Particle size $\mu\text{m}$	Oversize (On mass basis) %	
	Class16	Class17
1	-	80 $\pm$ 5
2	76 $\pm$ 5	54 $\pm$ 5
4	-	18 $\pm$ 5
5	23 $\pm$ 5	-
8	-	4 $\pm$ 3
10	10 $\pm$ 5	-
16	-	1 max
20	1 max	-