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JAPANESE INDUSTRIAL STANDARD

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Testing methods for polytetrafluoroethylene molding powder

ICS 83.080.20

Descriptors : polytetrafluoroethylene, particulate materials, density measurement, tensile testing, tensile strength, elongation, particle size distribution, particle size measurement, water content determination, volatile matter determination, melting point, dielectric breakdown, plastics

Reference number : **JIS K 6891 : 1995 (E)**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

Date of Establishment: 1964-03-01

Date of Revision: 1995-04-01

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In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

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JAPANESE INDUSTRIAL STANDARD JIS K6891:1995

Testing Methods for Polytetrafluoroethylene Molding Powder

1. Scope

This Japanese Industrial Standard specifies the testing methods for polytetrafluoroethylene molding powder ([1]) used for the compression or extrusion molding, hereinafter referred to as the "powder".

Note ([1]) The powder mentioned herein has to contain no additives such as fillers and pigments. The powder to be used for paste extrusion is excluded from the application of this standard.

Remarks 1 Applicable Standards and Reference Standards: See page 14.

2 The units and numerical values given in { } in this standard are in accordance with the conventional system of units and are appended for reference.

2. Definition on Terms

2.1 Free Baking The free baking mentioned in this standard is defined as the process in which the powder which is compressed in a die at ordinary temperature (preform) is taken out of the die and heated in a furnace until the crystalline phase becomes completely amorphous and is allowed to cool in the furnace.

2.2 Hot Coining The hot coining mentioned in this standard is defined as the process in which the powder which is compressed in a die at ordinary temperature is taken out of the die, transferred in the heat molding metal die and then the die with the preform is heated in a furnace until the crystalline phase in the preform becomes completely amorphous, and immediately the heated product together with die is placed in a press and allowed to cool under a pressure.

3. Sampling of Powder and Preparation of Original Test Specimen

3.1 Sampling of Powder Appropriate number of containers specified in Table 1 shall be taken at random from the production lots which are considered to have homogeneous quality. Approximately equal quantity of the powder shall be taken from each container and mixed thoroughly. The amount of the powder thus taken shall be twice the volume required for the tests.

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Table 1

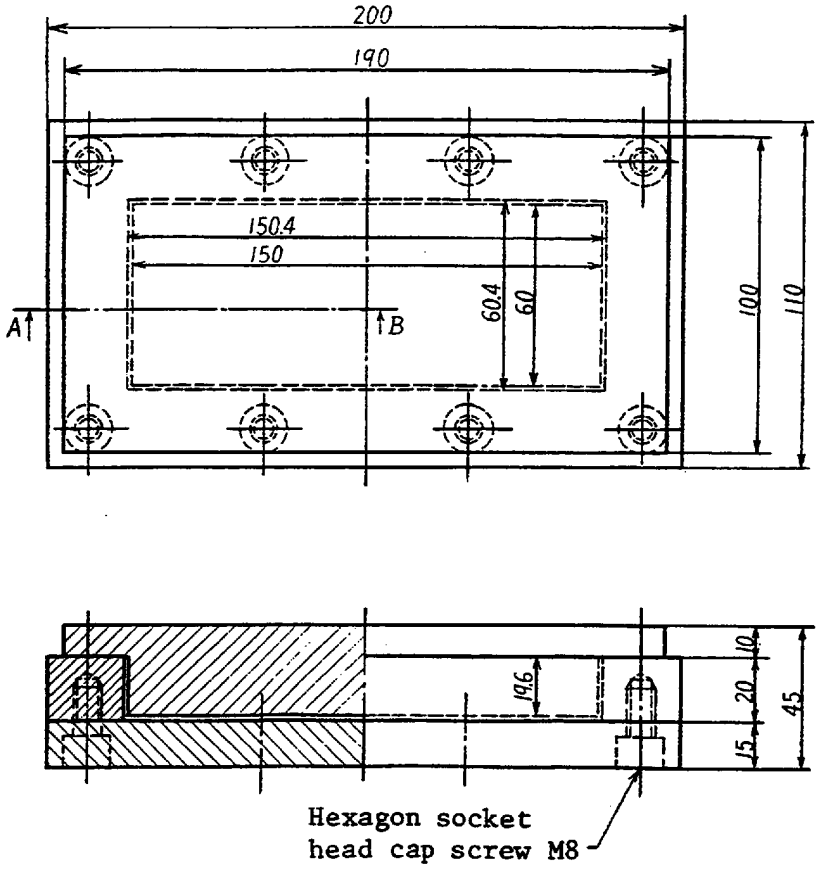
Number of containers consisting one lot	Minimum number of containers to be sampled
1	1
2	2
3 to 5	3
6 to 10	4
11 to 100	5
101 to 1000	6

3.2 Preparation of Original Test Specimen

3.2.1 Preparation of Sheet by Free Baking The powder shall be screened thoroughly through a 1.7 mm sieve specified in JIS Z 8801. About 40 g of the powder passing through the sieve shall be poured into the die shown in Fig. 1 in a layer of uniform thickness. The pressure of the molding machine shall be increased gradually up to 34.3 ± 4.9 MPa {350 ± 50 kgf/cm^2}, which shall be held on the sheet for 1 minute to make preformed sheet. The molded sheet shall then be taken out of the die and placed in a furnace. The furnace temperature shall be elevated up to 365 ± 5°C at the rate of 90 ± 30°C per hour, and shall be heated at 365 ± 5°C for 3 hours, and then shall be lowered to 200°C at the rate of 50 ± 5°C per hour. The heated sheet shall be taken out in the room and allowed to cool to room temperature.

Fig. 1. Die for Preforming Sheet

Unit: mm



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3.2.2 Preparation of Sleeve for Tape Specimen by Free Baking

The powder shall be screened thoroughly through a 1.7 mm sieve specified in JIS Z 8801, and about 150 g thereof passing through the sieve shall be poured into the preform die shown in Fig. 2 in a layer of uniform thickness. The pressure of the molding machine shall be increased gradually up to 34.3 ± 4.9 MPa {350 ± 50 kgf/cm^2}, which shall be held for 1 minute to make preformed sleeve. The preformed sleeve shall then be taken out of the die and placed vertically in the furnace. The furnace temperature shall be elevated up to 365 ± 5°C at the rate of 90 ± 30°C per hour, and shall be heated at 365 ± 5°C for 3 hours, and then shall be lowered to 200°C at the rate of 50 ± 5°C per hour. The heated sleeve shall be taken out in the room and allowed to cool to room temperature.

3.2.3 Preparation of Sleeve for Tape Specimen by Hot Coining

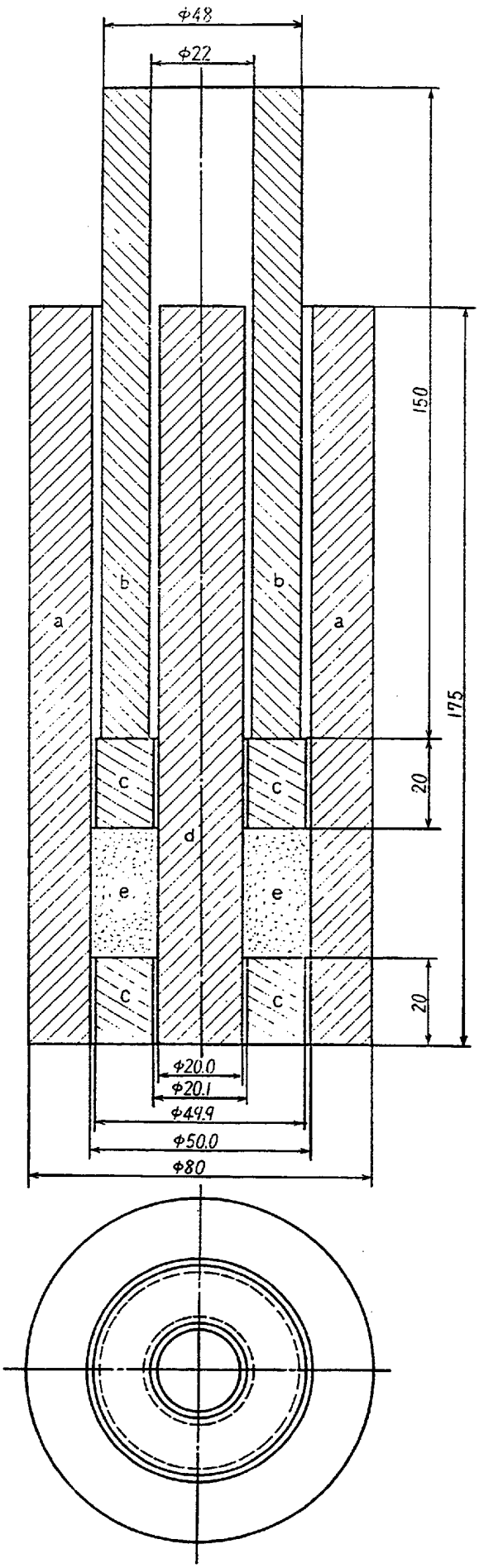
The sleeve preformed as described in 3.2.2 shall be placed in the heat molding die. The die with the preform shall be placed in a furnace, the furnace temperature shall be elevated up to 365 ± 5°C at the rate of 90 ± 30°C per hour, and shall be heated at 365 ± 5°C for 3 hours. The heated die with the sleeve shall immediately be pressed in a molding machine and a pressure of 14.7 ± 4.9 MPa {150 ± 50 kgf/cm^2} shall be kept for 30 minutes. After the pressure is removed, the sleeve shall be cooled to room temperature as it is held in the die.

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Fig. 2. Die for Preforming Tape Specimen

Unit: mm



a: Outside cylinder
b: Forcing cylinder
c: Forcing die
d: Core
e: Preformed sleeve

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