

2. The Influence of the Melting Conditions on the Running Quality of Aluminium

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Molten aluminium tapped out from the electrolytic furnace is often held in the holding furnace for a long time before casting ingots. It is important to know the influence of the holding time and temperature on the properties of molten aluminium. In this experiment, the running quality of molten aluminium is measured under the various melting conditions.

The measuring apparatus of a smaller size than the previous one (Sawamura and Morita, *Memoirs of College of Engineering, Kyoto Imperial University*, 11 (1943), No. 2, 15; *Nippon Kinzoku Gakkaishi*, 7 (1942), 28.) is used. Although the downgate and the cross section of the measuring canal in this apparatus have just the same dimensions as the previous apparatus, the dimensions of all other parts are reduced so that the apparatus may be easily handled by one operator and the molten metal to be used in the test may be saved. The length of the measuring canal is 60 cm and the weight of the whole assembly is 10 kg. It should be noticed that, though the hydrostatic head is decreased from 15.7 cm to 7.9 cm, this apparatus gives the same length of flow as the previous one and very good reproducibility ($\pm 1\%$). The method of the preparation of the test mould are the same as the previous experiment.

About 350 gr of aluminium (99.67%) is melted in a graphite crucible, heated up to the maximum heating temperature, 850°C, 800°C and 770°C respectively, in 15 minutes after melting down, held at those temperatures for 0, 0.5, 1, 1.5, 2, 4, 6, 8, 10, 12, 16, 20 and 24 hrs., and then poured into the sand reservoir having a graphite stopper. The pouring temperature is 710°C.

The results obtained are as followings. The running quality of molten aluminium is better in the order of maximum heating temperature, 800°C, 850°C and 770°C, and in each case, increases at the holding time between 0.5 and 1 hrs., and decreases at about 1.5 hrs., and tends to increase with further holding time, but there is not so remarkable difference between them.

3. Study on High Dielectric Constant Ceramics. (VIII) BaTiO₃ Single Crystal

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Single crystals of BaTiO₃ have been investigated by means of the polarization