
**Materials for the production of primary
aluminium — Dense refractory bricks —
Determination of cryolite resistance**

*Matériaux pour la production de l'aluminium de première fusion —
Briques réfractaires denses — Détermination de la résistance de la
cryolite*



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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 20292 was prepared by Technical Committee ISO/TC 226, *Materials for the production of primary aluminium*.

Materials for the production of primary aluminium — Dense refractory bricks — Determination of cryolite resistance

1 Scope

This International Standard covers materials for the production of primary aluminium.

This International Standard specifies a method for the determination of the resistance of dense refractory bricks to cryolite melt with excess sodium fluoride.

2 Principle

A mixture of fine powders ($< 100 \mu\text{m}$) of cryolite and sodium fluoride are allowed to react at 950°C in a furnace for 24 h in air, on a crucible-shaped test piece made of the dense refractory brick material to be tested.

Reacted and/or infiltrated areas of brick material are calculated. Together with the calculation, a visual description of the reaction extent is recommended and photographs should also be used to illustrate the attack.

3 Sampling

Take a number of different bricks from within the batch to be tested. Take a minimum of two sample bricks to prepare test pieces. The test pieces are taken from different bricks.

4 Reagents

4.1 Cryolite (Na_3AlF_6) powder, with a minimum purity of 97 % mass fraction and a particle size $< 100 \mu\text{m}$.

4.2 Sodium fluoride (NaF) powder, with a minimum purity of 99 % mass fraction and a particle size $< 100 \mu\text{m}$.

IMPORTANT — The electrolyte used in aluminium electrolysis will penetrate through the carbon block materials and then into the refractory. It is essential that this electrolyte penetration be stopped by reaction with the refractory. It is hence important to test the different refractory materials for resistance towards penetration. This test correlates well with penetration in industrial cells.

5 Apparatus

5.1 Diamond saw, with water cooling.

5.2 Core drilling apparatus, standard drilling machine with water cooling.