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## Anodizing of aluminium and its alloys — Determination of electric breakdown potential

Anodisation de l'aluminium et de ses alliages — Détermination de la tension électrique de claquage



Reference number ISO 2376:2010(E)

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#### Foreword

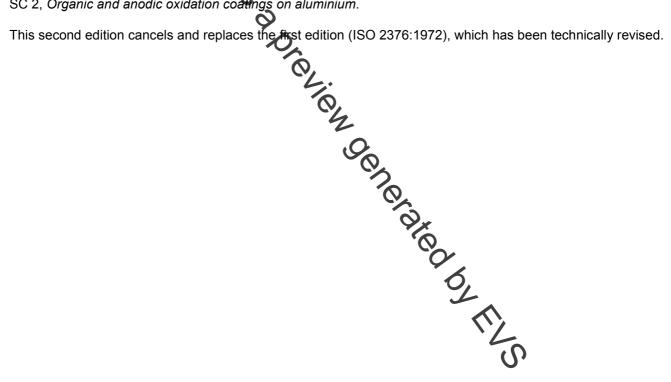
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# Anodizing of aluminium and its alloys — Determination of electric breakdown potential

### 1 Scope

This International Standard specifies test methods for the determination of the electric breakdown potential of anodic oxidation coatings on aluminium and its alloys, on flat or near-flat surfaces and on round wire. The methods are applicable to anodic oxidation coatings used primarily as electrical insulators.

The methods are not applicable to coatings in the vicinity of cut edges, the edges of holes, or sharp changes of angle on, for example, extruded shapes.

NOTE 1 The methods described donot give satisfactory results for unsealed coatings.

NOTE 2 Electric breakdown potential is affected by relative humidity.

#### 2 Principle

The electric voltage at which current first passes through an anodic oxidation coating is measured; this breakdown potential is a function of the dielectric characteristics and the insulation properties of the oxidation coatings. The breakdown potential depends upon the thickness of the coating, as well as on many other factors, particularly the composition of the basis metal, its surface condition, the effectiveness of sealing, the dryness of the sample and the degree of ageing.

#### 3 Apparatus

**3.1 Power supply**, from a suitable 50 Hz or 60 Hz source.

**3.2** Transformer (a.c.), having an output with a waveform as not y sinusoidal as possible, capable of producing the potential required.

**3.3** Voltage regulator, enabling the test potential to be increased gradually from any point without interruption, and providing an essentially undistorted waveform so that the peak potential is within the limit  $\sqrt{2} \pm 5$  % (i.e. 1,34 to 1,48) of the root-mean-square (r.m.s.) potential.

**3.4** Current limiting resistor,  $0,5 \text{ M}\Omega$ , in series with secondary winding of the ransformer and the test electrode probe (3.6).

**3.5 Potential-measuring device**, which gives r.m.s. values, expressed in volts.

**3.6** Electrode probe, made from conducting material, suitably insulated for handling purposes, free to move as required and adequately supported. The contact surface shall be spherical with a diameter of 3 mm to 8 mm and shall be maintained in a smooth, untarnished condition. The design of the probe shall be such that, when the spherical surface is placed on the surface of the anodized test specimen, the total force exerted on the coating is 0,5 N to 1,0 N (a probe of mass 50 g to 100 g is suitable).