

BSI BS*EN*10209 96 ■ 1624669 0543359 336 ■

Page 14

EN 10209 : 1996

Prepare the bath in the following way: add 40 ml of H_2SO_4 (density 1,84) to 150 ml of deionized water. Then, make up to 1000 ml with water. Having increased the temperature of the solution to the pickling temperature of 70 °C, dissolve $2 g \pm 0,2 g$ of the steel sheet identical to the sheet to be tested having been subjected to treatments C.6 and C.7 (dissolution approximately 20 min.) to attain an Fe^{2+} concentration of $2 g/l \pm 0,2 g$. Check the concentrations of sulfuric acid and Fe^{2+} .

Change the pickling bath after pickling a maximum of three test pieces. Do not use the new bath more than three days after it has been prepared.

Bath No. 8: Cold rinsing

Spraying (or immersion) in mains water for 15 s.

Bath No. 9: Neutralization

Immerse the samples in the alkaline solution (for example, 6 g/l of $Na_2CO_3 \pm 0,7 g/l$ of $Na_2B_4O_7$, at 50 °C, for 2 min.

Bath No. 10: Hot rinsing

Spraying (or immersion) in mains water at 65 °C for 30 s.

C.9 Drying

Dry with an electric hot air drier.

C.10 Weighing

After cooling to room temperature, weigh the test pieces immediately (value P_2).

C.11 Evaluation

Calculate the loss due to pickling P ($g/m^2/surface$) on the basis of the difference in the two weights divided by the total surface area of the test piece ($0,02 m^2$):

$$P = \frac{P_1 - P_2}{0,02} \text{ (g/m}^2\text{/surface)}$$

Indicate the values of each test and the mean obtained on the basis of not less than 3 test pieces. A maximum scatter of 10 % is permissible. If it is greater, repeat the test.

Annex D (normative)

Method for determining the adherence level of enamel applied to a steel sheet

D.1 Field of application

The test pieces shall be flat, not deformed and have a thickness of between 0,60 mm and 3 mm.

D.2 Principle

The sample of enamelled sheet shall be deformed by a punch with an hemispherical tip onto which falls a 1,5 kg mass, dropped from a height which is a function of the thickness of the sheet prior to enamelling.

D.3 Apparatus

- *Impact testing machine* as shown in figure D.1.
- *Document showing the reference photos of the five adherence levels of each of the three types* (conventional ground coat enamelling, conventional ground coat enamelling + white cover coat and direct-on vitreous enamelling) given in figure D.2.

D.4 Description of the apparatus

The impact testing machine is shown in figure D.1.

The piece which strikes the punch shall have a mass of 1,5 kg.

The punch tip shall be hemispherical and have a 22 mm diameter.

The diameter of the hole punched into the base shall be 20,6 mm and the radius of the entrance to this hole shall be 2 mm.

D.5 Procedure

First clean the enamelled test sheet with kitchen paper and fix it between the base and the support.

Position the 1,5 kg weight at height h , which shall be a function of the thickness of the sheet prior to enamelling and is given in figure D.1 below.

Table D.1 Drop height h

$0,6 \text{ mm} \leq \text{thickness} \leq 0,8 \text{ mm}$	$h = 300 \text{ mm}$
$0,8 \text{ mm} < \text{thickness} \leq 1,2 \text{ mm}$	$h = 500 \text{ mm}$
$1,2 \text{ mm} < \text{thickness} \leq 3 \text{ mm}$	$h = 750 \text{ mm}$

Drop the weight.

Remove the punched sample having raised the support which is attached to the guide tube.

No further splintering of the enamel shall be expected before the adherence level is evaluated.

BSI BS*EN*10209 96 ■ 1624669 0543360 058 ■

Page 15
EN 10209 : 1996

D.6 Adherence level evaluation

D.6.1 Flat pieces

This shall be evaluated by comparing the appearance of the impact on the enamelled test sheet with the reference photos (figure D.2).

Level '1' corresponds to a very good adherence level and level '5' is very poor.

- class 1: The impact surface is completely covered with enamel still with a bright appearance (excellent adherence).
- class 2: The impact surface is almost completely covered with enamel (under bonding layer) (very good adherence).
- class 3: The impact surface is to a large extent covered with enamel but there are some bare areas (moderate adherence).
- class 4: The impact surface is to a large extent bare, but there are still some areas of enamel (poor adherence).
- class 5: The impact surface is completely bare, the enamel/steel fracture is clear (very poor adherence).

D.6.2 Deformed pieces

If deformed pieces have to be tested, agreement shall be reached between the purchaser and supplier prior to the test about the equipment to be used.

Interpretation of the test results shall also be agreed upon prior to the test.

Except for the interpretation and test equipment, annex D remains valid.

BSI BS*EN*10209 96 ■ 1624669 0543361 T94 ■

Page 16

EN 10209 : 1996

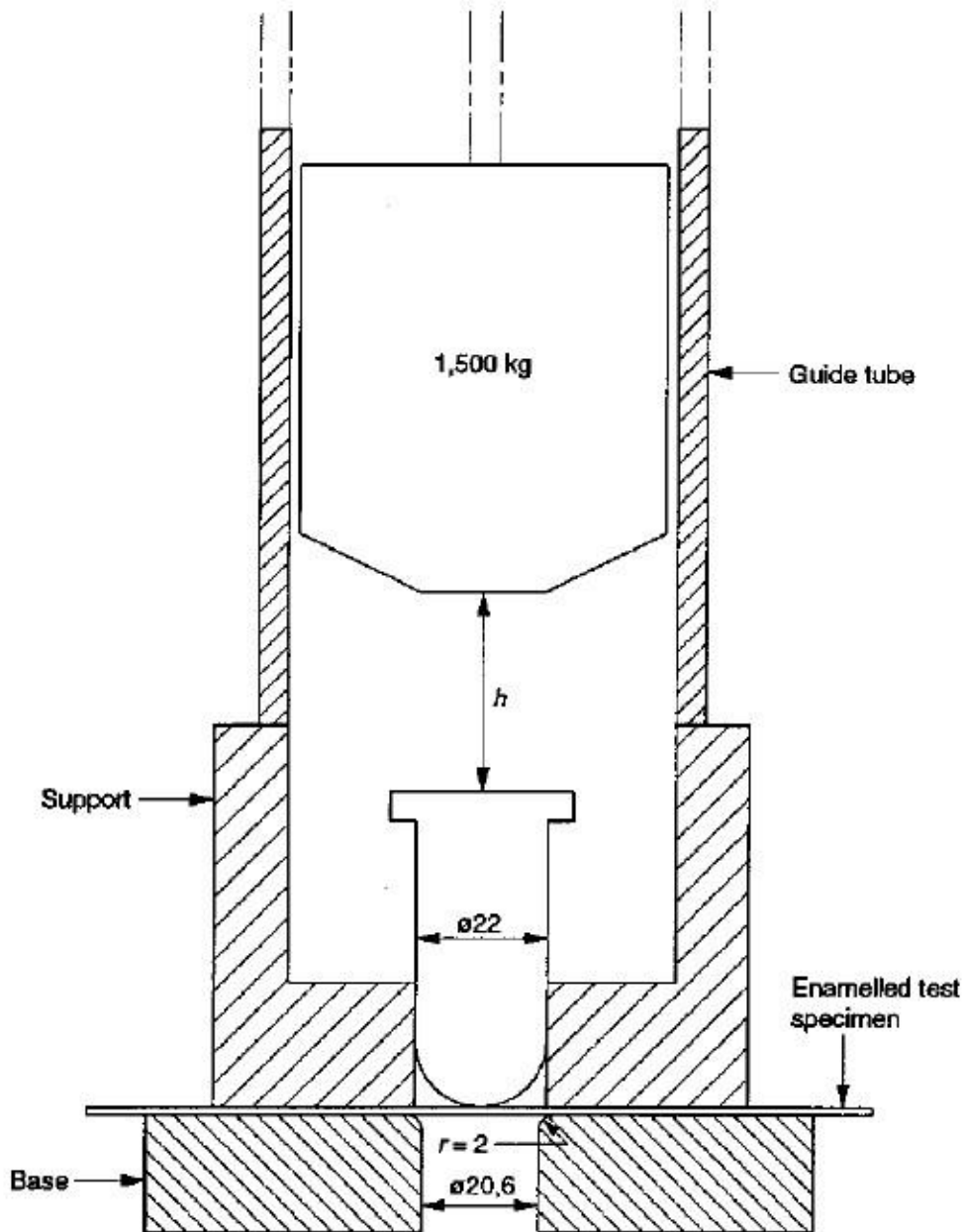


Figure D.1 Impact testing machine

BSI BS*EN*10209 96 ■ 1624669 0543362 920 ■


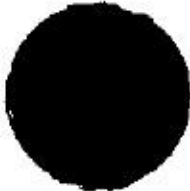










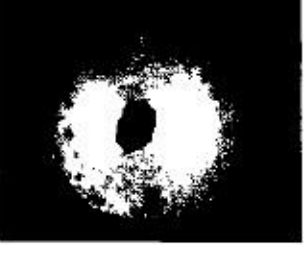


Adherence level	Conventional enamelling		Direct-on enamelling
	Ground coat enamelling	Ground coat enamelling + cover coat	
1			
2			
3			
4			
5			

Figure D.2 Enamel adherence test: impact test.