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RAILWAY PERMANENT WAY MATERIAL Part 8—DOGSPIKES



AS 1085
Railway permanent way
material

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Dogspikes

Specifies requirements for
16 mm and 19 mm steel
dogspikes with square shanks
and 22 mm diameter round
shank steel dogspikes for use
with the steel rails specified in
AS 1085.1—1990.

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- Bureau of Steel Manufacturers of Australia
 - Railways of Australia Committee
 - Cement and Concrete Association of Australia
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AUSTRALIAN STANDARD

**RAILWAY PERMANENT WAY
MATERIAL**

**Part 8
DOGSPIKES**

AS 1085.8—1988

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PREFACE

This Standard was prepared by the Association's Committee on Railway Permanent Way Materials to supersede AS 1085.8—1979.

This edition incorporates the following principal changes from the 1979 edition:

- (a) Inclusion of referenced documents.
- (b) Deletion of Table 1, Dimensional Tolerances. Tolerances have been amended, where necessary, and incorporated in Figures 1 and 2.
- (c) Inclusion of a clause on method of manufacture.
- (d) Inclusion of clauses on post-forging heat treatment and finish.
- (e) Inclusion of a clause on strength test for extraction surfaces. The minimum strengths specified may need to be increased at a later date as a result of experience and testing.
- (f) Extension of clauses on tests, number of tests and retests.
- (g) In the Figures, changes to the shape of the head, viz
 - (i) A spherical radius on the top of the head to eliminate ambiguities in dimensioning and ease die manufacture.
 - (ii) Allowable draft shown on the sides and back of the head.
 - (iii) Elimination of the 3-degree angle under the head, on the 16 mm dog spike only, to permit extraction by machine.
 - (iv) The fin now shown on the elevation views of the drawing of the 16 mm dog spike.
 - (v) The maximum allowable fin reduced to an elliptical profile to suit the claws of narrow manual extraction bars, jaws of hydraulic spike pullers, and shrouds of the hammers of spike driving machines.
 - (vi) Overall head thickness slightly reduced.
 - (vii) Increased radii on the corners of the head to facilitate filling the die cavity.
 - (viii) Limits added to radii for consistency.
- (h) Other changes in the Figures are—
 - (i) prohibition of a fin under the head on the spike extraction surfaces; and
 - (ii) limits added to the dimensions of the conical point.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

RAILWAY PERMANENT WAY MATERIAL

PART 8—DOGSPIKES

1 SCOPE. This Standard sets out the requirements for 16 mm and 19 mm steel dogspikes with square shanks for use with the steel rails specified in AS 1085.1.

NOTE: It is essential that the purchaser supply the manufacturer with certain information when enquiring about or ordering dogspikes to this Standard. Purchasing guidelines are given in Appendix A.

2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

- AS
 1050 Methods for the analysis of iron and steel
 1085 Railway permanent way material
 Part 1: Steel rails (AS 1085.1)
 1204 Structural steels—Ordinary weldable grades
 1213 Iron and steel—Methods of Sampling
 2706 Numerical values—Rounding and Interpretation of limiting values.
 K1 Methods for the sampling and analysis of iron and steel.

3 CHEMICAL COMPOSITION. Steel used for the manufacture of dogspikes shall comply with the requirements of AS 1204, Grade 250.

4 METHOD OF MANUFACTURE. Dogspikes shall be produced by hot or cold forging with or without a second heat or post-forging heat treatment, and with or without secondary machining.

5 POST-FORGING HEAT TREATMENT. After hot forging, dogspikes shall be allowed to cool slowly in air or in a bin with other hot dogspikes.

Dogspikes shall not be cooled by quenching.

6 SHAPE AND DIMENSIONS. Dogspikes shall conform to the shape, dimensions and tolerances shown in—

- (a) Figure 1 (for 16 mm dogspikes); and
 (b) Figure 2 (for 19 mm dogspikes).

7 FINISH. Dogspikes shall be free from harmful cracks, ragged edges, or other mechanical defects detrimental to their end use including extraction from the sleeper.

8 TESTS.

8.1 Bend test for shank. The shank of the finished dogspike shall be capable of being bent cold through 180 degrees around a pin of diameter equal to 1.5 times the size of the shank of the dogspike without cracking on the outside of the bent portion.

8.2 Upward bend test for head. The head of the finished dogspike shall be capable of being bent upward cold through 30 degrees without cracking on the outside of the bent portion. The 30 degrees of bending shall not include any angular displacement due to bending of the shank.

8.3 Downward bend test for head. The head of the finished dogspike shall be capable of being bent downward cold through 25 degrees relative to the lower part of the shank without opening any cracks at the back of the head and shank when the head is held in a fixture which—

- (a) supports the back of the shank to within 6 mm of the underside of the fin; and
 (b) supports the sides of the shank but leaves the 10 mm of the shank under the intersection of the rail clamping face and the face of the shank clear to the end.

8.4 Strength test for extraction surfaces.

8.4.1 Requirement. When the dogspike is tested in accordance with Clause 8.4.2, the metal supporting the extraction surfaces of the dogspike, i.e. the two surfaces under and at each side of the head, shall be capable of withstanding the following extraction force without permanent deformation of the sides of the head:

- (a) For 16 mm square dogspike 25 kN.
 (b) For 19 mm square dogspike 70 kN.

8.4.2 Test procedure. The test shall be carried out by pulling the pointed end of the dogspike with the specified force, through a square hole in a block, while the extraction surfaces of the dogspike are supported on the other side of the block from the pulling side. The surfaces shall be supported by two parallel ridges on the block which have radiused contact surfaces C mm long and spaced B mm apart, symmetrically about the hole where—

- (a) For 16 mm square dogspike B=23 and
 C=20; and
 (b) For 19 mm square dogspike B=26 and
 C=23 mm.

9 NUMBER OF TESTS.

9.1 Number of bend tests. One bend test of each kind specified for shank and head shall be made from each batch of dogspikes of 5 t or fraction thereof.

9.2 Number of strength tests. One strength test specified for the extraction surfaces shall be made from each batch of dogspikes of 5 t or fraction thereof.