



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS E 1126 : 1998

(Reaffirmed : 2003)

Expansion joints

ICS 45.080

Descriptors : railway equipment, railway fixed equipment, railway rails, rail base plates, telescopic, expansion joints

Reference number : JIS E 1126 : 1998 (E)

PROTECTED BY COPYRIGHT

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

Date of Establishment: 1998-07-20

Date of Reaffirmation: 2003-01-20

Date of Public Notice in Official Gazette: 2003-01-20

Investigated by: Japanese Industrial Standards Committee

Divisional Council on Railways and Rolling
Stock

JIS E 1126:1998, First English edition published in 2004-06

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

Expansion joints

1 Scope This Japanese Industrial Standard specifies expansion joints used for 50 kgN rails and 60 kg rails used in continuous welded rail⁽¹⁾ section and so on of railway track. However, the expansion joints for Shinkansen railway and for bridges based on the National Shinkansen Network Law are not applied.

Note ⁽¹⁾ The welded rail of not less than 200 m in length (see **JIS E 1001**).

2 Normative references The normative references of this Standard are as follows.

JIS B 0601 *Surface roughness—Definitions and designation*

JIS B 0659 *Roughness comparison specimens*

JIS B 1180 *Hexagon head bolts and hexagon head screws*

JIS B 1181 *Hexagon nuts and hexagon thin nuts*

JIS E 1001 *Glossary of terms for permanent way*

JIS E 1101 *Rails*

JIS E 1120 *Heat hardened rails*

JIS E 1303 *Railway turnouts and crossings*

JIS E 1311 *Railway—Turnouts and crossings—Vocabulary*

3 Definitions For the purposes of this Standard, the definitions given in **JIS E 1001** and **JIS E 1311** and the following definitions apply.

- (1) **expansion joints** The joints which control the stretch and contract of continuous welded rails (see **JIS E 1001**).
- (2) **tongue rails for expansion joints** The rails of the sharpened head point, which are jointed to the stroke rails, and used for the expansion joints.
- (3) **stroke rails for expansion joints** The rails, which are jointed to the tongue rails for expansion joints, and used for the expansion joints.

4 Classification The classification of expansion joints shall be as shown in Table 1 with mark ○ according to the combination of the classification of rail and the curve radius.

5 Quality

5.1 Stroke The expansion joints shall be capable of stroking smoothly within the range of expansion length as shown in Attached Fig. 1 and Attached Fig. 2, when tested in accordance with the method of 9.1.

5.2 Appearance The appearance of expansion joint shall have no detrimental defects such as cracks, scars and so on on the surface.

Furthermore, there shall be no detrimental twist for the whole length of tongue rails for expansion joints (hereafter referred to as “tongue rails”) and stroke rails for expansion joints (hereafter referred to as “stroke rails”).

6 Shapes, dimensions, permissible dimension deviations and geometrical tolerances

6.1 Shapes and dimensions The shapes and dimensions of expansion joints shall be as shown in Table 2.

Table 1 Classification

Classifications of rails			Curve										Straight	
			Curve radius R (m)											
			400	500	600	800	1 000	1 200	1 500	2 000	2 500	3 000		
Rails for 50 kgN	50 N	Ordinary rails		○	○	○	○	○	○	○	○	○	○	○
		Heat hardened rails	HH340	○	○	○	○	○	○					
			HH370	○	○	○	○	○	○					
Rails for 60 kg	60	Ordinary rails		○	○	○	○	○	○	○	○	○	○	○
		Heat hardened rails	HH340	○	○	○	○	○	○					
			HH370	○	○	○	○	○	○					

Remarks : The rails for straight are shown in A and B of Attached Fig. 1 and Attached Fig. 2, and the rails for curve are shown in C, D, E and F of Attached Fig. 1 and Attached Fig. 2.

Table 2 Shapes and dimensions

Marking	Attached Figure number			
	Expansion joints	Tongue rails	Stroke rails	Parts
50N	1	1.1	1.2	1.3 to 1.8
60	2	2.1	2.2	2.3 to 2.4

Remarks : The offset⁽²⁾ and direction of curve of expansion joints for curve rails shall be as shown in C to F of Attached Fig. 1 and Attached Fig. 2.

Note (2) The value explaining the shape and dimensions of curve or polygonal line and defining as a perpendicular distance from one straight line (see JIS E 1311).

6.2 Permissible dimension deviations and geometrical tolerances The permissible dimension deviations and geometrical tolerances of expansion joints shall be as shown in Table 3.

Table 3 Permissible dimension deviations and geometrical tolerances of expansion joints

Item		Permissible dimension deviations and geometrical tolerances
Length ⁽³⁾		± 10
Gauge ⁽⁴⁾		± 2
Cross level ⁽⁴⁾		± 2
Alignment ⁽⁵⁾		± 1
Longitudinal level ⁽⁵⁾		± 2
Offset for curve ⁽⁶⁾	For 5 mm and over	± 1
	For under 5 mm	± 0.5
The gap between the adhesion part of tongue rail and stroke rail	Top part	Max. 0.5
	Bottom part	Max. 1

Notes (3) The total length in the condition of Attached Fig. 1 and Attached Fig. 2 is specified.

(4) Shall be measured at the point shown in Attached Fig. 3 assembled as a track skeleton⁽⁷⁾ condition.

(5) Piano wire or leveling string shall be strung for the whole length as shown in Attached Fig. 3 and measure at the measuring point ③.

(6) Measure the offset shown as C to F in Attached Fig. 1 and Attached Fig. 2.

(7) An assembled construction as a ladder with rails and sleepers (see **JIS E 1001**).

7 Material

7.1 Rails The materials of tongue rails and stroke rails used for expansion joint shall comply with **JIS E 1101** and **JIS E 1120**.

7.2 Parts The materials of the parts for expansion joint shall be in accordance with 5.4 of **JIS E 1303**.

8 Method of production and processing

8.1 Processing of rails The processing of rails shall be as follows.

8.1.1 Cutting The cutting of rails shall be machined and shall not be fused nor broken.

8.1.2 Bending The bending or correcting of bend of rails shall be performed by a method which does not degrade the quality of the rails.

8.1.3 Forming The forming of top, bottom and belly part of rails shall be machined.

8.1.4 Perforating The perforating of rails shall be performed with machining, and the whole circumference shall be chamfered for 1.5 mm.

8.1.5 Finishing The finishing shall be as follows.

- (1) At the corner of bottom side surface of shaved rails, the roundness of R4 mm shall be performed.
- (2) At the rail end part where the joint bar overlaps, the chamfering of about 1.6 mm at the head part and the top neck part shall be performed.
- (3) The burr and so on shall be removed.

8.1.6 Bending of rails for curve The tongue rails and stroke rails for curve, after processed as shown in the shape of Attached Fig. 1.1, Attached Fig. 1.2, Attached Fig. 2.1 and Attached Fig. 2.2, shall be bent to become the shapes of C to F of Attached Fig. 1 and Attached Fig. 2.

8.1.7 Permissible dimension deviations The permissible dimension deviations of processed rails shall be in accordance with Attached Fig. 1 and Attached Fig. 2 of **JIS E 1303**.

8.2 Processing of parts

8.2.1 Cutting, bending and forming The cutting, bending and forming shall be performed with harmless method to the quality.

8.2.2 Perforating Swellings 3 mm and under in size, occurring in the perforating of the hole for dog spikes by punching are not necessary to be finished.

8.2.3 Finishing The finishing shall be as follows.

- (1) The surface roughness of floor board, on which tongue rails and stroke rails expand or contract, shall be 36 μmRy of **JIS B 0601**.
- (2) The surface roughness of planed surface other than the parts mentioned in (1) shall be 50 μmRy of **JIS B 0601**.

8.2.4 Permissible dimension deviations The permissible dimension deviations of parts shall be as follows.

- (1) Bolts and nuts shall be in accordance with the parts grade C of **JIS B 1180** and **JIS B 1181** unless particularly specified.
- (2) The dimension of the spherical hole of floor board, into which the head of rail jointing bolt is inserted, shall be such that the bolt top of the standard dimension shall become 0.5 mm to 1.5 mm inside from the bottom face of floor board.
- (3) The other permissible dimension deviations shall be in accordance with Attached Fig. 12, Attached Fig. 13 and Attached Fig. 14 of **JIS E 1303**.

Furthermore, the hole diameter of hole for bolts not specified in Attached Figures shall be ± 0.5 mm or under, and the side length of square hole for dog spike shall be +1.5 mm to -0.5 mm.

9 Testing

9.1 Stroke test

9.1.1 Test specimen The test specimen shall be subjected to the agreement between the purchaser and the supplier, and shall be the product assembled at the works by the supplier.

9.1.2 Testing method The testing shall be performed for the stroke test in the expansion range as shown in Attached Fig. 1 and Attached Fig. 2 for tongue rails and stroke rails after assembled every one set of the expansion joint as shown in Attached Fig. 1 and Attached Fig. 2.

9.2 Surface roughness measuring The finished surface roughness measuring of tongue rails, stroke rails, parts and so on shall be performed comparing to the standard specimen of **JIS B 0659** or the standard specimen produced according to **JIS B 0601**.

10 Inspection

10.1 Inspection of shapes and dimensions The inspection of shapes and dimensions of expansion joints shall be in accordance with clause 6.

10.2 Stroke test The stroke test results tested by the method of 9.1 shall comply with 5.1.

10.3 Surface roughness inspection The surface roughness inspection of expansion joints shall comply with 6.1.5 (1) and 6.2.4 of **JIS E 1303**.

10.4 Inspection of appearance The inspection of appearance of expansion joints shall be in accordance with 5.2.

11 Packaging The expansion of joints shall be as 10 (2) to (3) of **JIS E 1303**.

12 Designation The designation of expansion joints shall be the standard number or the name of standard, the classification of rail or the marking, direction of curve and radius of curvature.

Example 1	JIS E 1126	For 50 kgN	For ordinary rails	Straight A	
Example 2	JIS E 1126	For 50 N	For HH340	Curved C	R600
Example 3	Expansion joint	For 50 N	For HH340	Curved C	R600

13 Marking The marking of expansion joints shall be as follows.

13.1 The marking of parts The marking of rails and parts shall be in accordance with Table 4. However, the year of production shall be expressed with the last two digits and the name of producer by its abbreviation.