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Belt drives — Narrow V-belts — Sections 9N/J, 15N/J and 25N/J (lengths in the effective system)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8419 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 1, *Friction belt drives*.

This third edition cancels and replaces the second edition (ISO 8419:1994), of which it constitutes a technical revision.

Belt drives — Narrow V-belts — Sections 9N/J, 15N/J and 25N/J (lengths in the effective system)

1 Scope

This International Standard specifies, for narrow V-belts of cross-sections 9N/J (for pulley grooves of effective width 8,9 mm), 15N/J (for pulley grooves of effective width 15,2 mm) and 25N/J (for pulley grooves of effective width 25,4 mm),

— the standard effective lengths,

— the tolerances on effective lengths,

— the centre distance variations,

— the conditions for measuring the effective length and the centre distance variation, and

— the designation and marking.

NOTE 1 The cross-section of a narrow V-belt is defined by a number (9, 15 or 25) followed by the letter N or J to denote single or joined belts.

NOTE 2 To define belts of raw-edge cogged construction, the letter “X” is added, i.e. NX or JX.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1081, *Belt drives — V-belts and V-ribbed belts, and corresponding grooved pulleys — Vocabulary*

ISO 5290:2001, *Belt drives — Grooved pulleys for joined narrow V-belts — Groove sections 9N/J, 15N/J and 25N/J (effective system)*

ISO 9608, *V-belts — Uniformity of belts — Test method for determination of centre distance variation*

3 Terms, definitions and symbols

For the purposes of this document, the terms, definitions and symbols relating to drives using V-belts (i.e. belt and grooved pulleys) given in ISO 1081 and ISO 9608 apply

4 Effective length, L_e

4.1 The standard effective lengths are the effective lengths under tension measured under the conditions specified in 7.1.

4.2 The nominal values of the standard effective lengths of V-belts, expressed in millimetres, have been selected from the R 40 series of preferred numbers, in accordance with ISO 3.

4.3 Standard effective lengths are given in Table 1.

5 Tolerances on effective length

5.1 Manufacturing tolerances

The permissible manufacturing tolerances for effective length of narrow V-belts are given in Table 2.

5.2 Belt-matching tolerances for narrow V-belts in same set

Values for the tolerances on the lengths of narrow V-belts of the same set in multiple V-belt drives are given in Table 3.

Table 1 — Standard effective lengths

Dimensions in millimetres

Cross-sections		
9N, 9NX, 9J, 9JX	15N, 15NX, 15J, 15JX	25N, 25NX, 25J, 25JX
L_e		
630	1 270	2 540
670	1 345	2 690
710	1 420	2 840
760	1 525	3 000
800	1 600	3 180
850	1 700	3 350
900	1 800	3 550
950	1 900	3 810
1 015	2 030	4 060
1 080	2 160	4 320
1 145	2 290	4 570
1 205	2 410	4 830
1 270	2 540	5 080
1 345	2 690	5 380
1 420	2 840	5 690
1 525	3 000	6 000
1 600	3 180	6 350
1 700	3 350	6 730
1 800	3 550	7 100
1 900	3 810	7 620
2 030	4 060	8 000
2 160	4 320	8 500
2 290	4 570	9 000
2 410	4 830	9 500
2 540	5 080	10 160
2 690	5 380	10 800
2 840	5 690	11 430
3 000	6 000	12 060
3 180	6 350	12 700
3 350	6 730	
3 550	7 100	
	7 620	
	8 000	
	8 500	
	9 000	

Table 2 — Manufacturing tolerances for narrow V-belts

Dimensions in millimetres

Nominal effective length L_e	Permissible deviation for sections 9N, 9NX, 15N, 15NX, 25N, 25NX and 9J, 9JX, 15J, 15JX, 25J, 25JX
$L_e \leqslant 800$	± 8
$800 < L_e \leqslant 1\,000$	± 10
$1\,000 < L_e \leqslant 1\,270$	± 13
$1\,270 < L_e \leqslant 1\,600$	± 16
$1\,600 < L_e \leqslant 2\,030$	± 20
$2\,030 < L_e \leqslant 2\,540$	± 25
$2\,540 < L_e \leqslant 3\,180$	± 32
$3\,180 < L_e \leqslant 4\,060$	± 40
$4\,060 < L_e \leqslant 5\,080$	± 50
$5\,080 < L_e \leqslant 6\,350$	± 63
$6\,350 < L_e \leqslant 8\,000$	± 80
$8\,000 < L_e \leqslant 10\,160$	± 100
$10\,160 < L_e$	± 125

Table 3 — Belt-matching tolerances

Dimensions in millimetres

Nominal effective length L_e	Maximum permissible deviation between the lengths of belts of the same set for sections 9N, 9NX, 15N, 15NX, 25N, 25NX and 9J, 9JX, 15J, 15JX, 25J, 25JX
$L_e \leqslant 800$	3
$800 < L_e \leqslant 1\,270$	4
$1\,270 < L_e \leqslant 2\,030$	6
$2\,030 < L_e \leqslant 3\,550$	8
$3\,550 < L_e \leqslant 6\,000$	10
$6\,000 < L_e \leqslant 10\,160$	14
$10\,160 < L_e$	18

6 Centre distance variations

Permissible centre distance variations of any belt are given in Table 4.

Table 4 — Centre distance variation limits

Dimensions in millimetres

Nominal effective length L_e	Cross-sections	
	9N, 9J, 9NX, 9JX 15N, 15J, 15NX, 15JX	25N, 25NX, 25J, 25JX
	ΔE	
$L_e \leqslant 1\,015$	1,2	1,8
$1\,015 < L_e \leqslant 2\,030$	1,6	2,2
$2\,030 < L_e \leqslant 5\,080$	2	3,4
$5\,080 < L_e$	2,5	3,4

7 Measuring and checking

7.1 Checking the belt length

For the measurement of the effective length, set the belt up on two identical pulleys with an effective circumference in accordance with that given in Table 5 and having functional dimensions, in accordance with ISO 5290. The pulleys shall be mounted on parallel horizontal axes on a testing bench. Apply the measuring force indicated in Table 5 to the sliding pulley. Rotate the pulleys in order that the belt effects one to three rotations and thus sits properly in the pulley grooves. Measure the distance between the axes of the pulleys.

The effective length L_e of any belt is given by the following formula:

$$L_e = E_{max} + E_{min} + C_e$$

where

E is the distance between the axes of the measuring pulleys, in millimetres;

C_e is the effective circumference of the measuring pulley, in millimetres.

Table 5 — Measurement characteristics

Belt section	Effective circumference of the measuring pulleys mm	Measuring force (per belt) N
9N, 9J, 9NX, 9JX	300	445
15N, 15J, 15NX, 15JX	600	1 000
25N, 25J, 25NX, 25JX	1 000	2 225

7.2 Checking the centre distance variation

Centre distance variations shall be checked in accordance with the test method described in ISO 9608.

8 Designation

The physical dimensions of narrow V-belts shall be designated by:

— the section (see Clause 1);

— the appropriate effective length (see Table 1).

EXAMPLE A belt of section 9N (single belt) or 9J (joined belt) and effective length 1 600 mm is designated as follows:

9N 1600

or

9J 1 600

9 Marking

All narrow V-belts manufactured in accordance with this International Standard shall be marked legibly and durably on the outer non-working face of the belt, with the appropriate designation.

Bibliography

[1] ISO 3, *Preferred numbers — Series of preferred numbers*

ICS 21.220.10

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