INTERNATIONAL STANDARD

ISO 7867-1

Fourth edition
2005-06-15

Tyres and rims (metric series) for agricultural tractors and machines —

Part 1: Tyre designation, dimensions and marking, and tyre/rim coordination

Pneumatiques et jantes (série millimétrique) pour tracteurs et machines agricoles —
Partie 1: Désignation, cotes et marquage des pneumatiques, coordination pneumatiques/jantes

Reference number
ISO 7867-1:2005(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 7867-1 was prepared by Technical Committee ISO/TC 31, *Tyre, rims and valves*, Subcommittee SC 5, *Agricultural tyres and rims*.

This fourth edition cancels and replaces the third edition (ISO 7867-1:1996), which has been technically revised.

ISO 7867 consists of the following parts, under the general title *Tyres and rims (metric series) for agricultural tractors and machines*:

— *Part 1: Tyre designation, dimensions and marking, and tyre/rim coordination*

— *Part 2: Service description and load ratings*

Tyres and rims (metric series) for agricultural tractors and machines —

Part 1:
Tyre designation, dimensions and marking, and tyre/rim coordination

1 Scope

This part of ISO 7867 establishes the size designation, the dimensional calculation and the markings of the metric series of tyres primarily intended for use on agricultural tractors and machines. Tyre and rim coordination is also given.

It applies to bias-belted, diagonal and radial tyres mounted an 5° tapered rims, as specified in ISO 4251-3. Only established rim diameters and widths within the ranges in Tables 1 and 2 are recommended.

This part of ISO 7867 also applies to different concepts and types of tyres and rims; in this case, however, appropriate rim/section ratios K_1 and coefficients K_2, a and b will be established and added.

Dimensions of existing rims are specified in ISO 4251-3.

NOTE Tyres (ply rating marked series) and rims for agricultural tractors and machines are specified in ISO 4251-1 to ISO 4251-5. Service description (load index — speed symbol) marking of the existing series of agricultural tractor-drive-wheel tyres is given in ISO 8664.

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 4223-1:2002, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres*

ISO 4251-3:1994, *Tyres (ply rating marked series) and rims for agricultural tractors and machines — Part 3: Rims*

ISO 7867-2, *Tyres and rims (metric series) for agricultural tractors and machines — Part 2: Service description and load ratings*

3 Terms and definitions

For the purposes of this part of ISO 7867, the terms and definitions given in ISO 4223-1 and the following apply.

3.1
agricultural tyre for special cultivation work
tyre for use on wheels (usually tractor drive wheels) on agricultural machines engaged in surface work or linear cultivation and the transport on roads and tracks of the tools required for such work

4 Tyre designation

4.1 General

The designation of the tyre shall be shown on its sidewall and shall include the following markings close to each other:

— size and construction characteristics (see 4.2);

— service description (see 4.3).

4.2 Size and construction characteristics

4.2.1 General

The size and construction characteristics shall be indicated as follows:

Nominal section width	/	Nominal aspect ratio	Tyre construction code	Nominal rim diameter code

4.2.2 Nominal section width

The nominal section width shall be expressed in millimetres and shall end in 0.

4.2.3 Nominal aspect ratio

The nominal aspect ratio shall be expressed as a percentage and shall be a multiple of 5.

4.2.4 Tyre construction code

The tyre construction code shall be as follows:

— “B” for bias-belted construction;

— “D” for diagonal/bias construction;

— “R” for radial construction.

NOTE Other codes will be established for new concepts (constructions) of tyres.

4.2.5 Nominal rim diameter code

For tyres mounted on 5° tapered rims, the rim diameter shall be expressed by a code comprising 1 or 2 digits. The code shall be as given in Table 1.

For tyres requiring new-concept rims, for safety reasons – especially concerning mounting – the code number shall be equal to the nominal rim diameter expressed in an integral number of millimetres, i.e. comprising 3 or 4 digits.

Table 1 — Nominal rim diameter code

Nominal rim diameter code [a]	Nominal rim diameter, D_r mm
4	101
6	152
8	203
(9)	229
10	254
12	305
(13)	330
14	356
(15)	381
16	406
(17)	432
18	457
(19)	483
20	508
22	559
24	610
25	635
26	660
28	711
30	762
32	813
34	864
36	914
38	965
40	1 016
42	1 067
44	1 118
46	1 168
48	1 219
50	1 270
52	1 321
54	1 372

[a] Values in parentheses are not recommended.

Table 2 — Rim width code

Rim width code	Measuring rim width, R_m mm
2.50	63,5
3.00	76,2
3.50	88,9
4.00	101,6
4.50	114,3
5.00	127
5.50	139,7
6.00	152,4
7.00	177,8
8.00	203,2
9.00	228,6
10.00	254
11.00	279,4
12.00	304,8
13.00	330,2
14.00	355,6
15.00	381
16.00	406,4
18.00	457,2
20.00	508
21.00	533,4
23.00	584,2
25.00	635
27.00	685,8
28.00	711,2
31.00	787,4
36.00	914,4
44.00	1 117,6

4.2.6 Rim width code

For tyres mounted on 5° tapered rims, the rim width shall be expressed by a code, as given in Table 2.

For tyres requiring new-concept rims, other code numbers will be established.

4.3 Service description

The service description shall be indicated as follows:

load index speed symbol

The characteristics are specified and explained in ISO 7867-2.

4.4 Other service characteristics

4.4.1 In the case of tubeless tyres, the marking “TUBELESS” shall be shown on the tyre.

4.4.2 In the case of a preferred direction of rotation of the tyre, an arrow shall be used to indicate that direction.

4.4.3 Specific indications, if required, may be added to indicate other characteristics.

4.5 Tyre classification and nomenclature (optional)

A tyre classification code – use of which is optional – may be used to describe the primary field of application for the tyre.

NOTE Nomenclature and a classification code are under study.

5 Marking

Tyres meeting the size and construction requirements and service description of this part of ISO 7867 shall be marked on the sidewall as shown in the example below.

EXAMPLE

A tyre having

a) size and construction characteristics of

— nominal section width 480 mm,

— nominal aspect ratio 70,

— radial construction (symbol R),

— nominal rim diameter code 38;

b) service description of

— basic load 2 900 kg (load index 145),

— reference speed 40 km/h (speed symbol A8).

The above tyre will be marked

480/70 R 38 145A8

In addition, other service characteristics, such as tubeless will be marked:

TUBELESS

6 Tyre dimensions

6.1 Calculation of "design tyre" dimensions

6.1.1 Theoretical rim width, R_{th}

The theoretical rim width R_{th} is equal to the product of the nominal section width S_N and the rim/section ratio K_1:

$$R_{th} = K_1 \cdot S_N$$

For factor K_1, see Table 3.

6.1.2 Measuring rim width, R_m

The measuring rim width R_m is the width of the standardized rim nearest to the theoretical rim width R_{th} (see Table 2 and Annex A).

6.1.3 Design tyre section width, S

The design tyre section width S is a nominal section width S_N, transferred from the theoretical rim width R_{th} to the measuring rim width R_m:

$$S = S_N + K_2(R_m - R_{th})$$

Round to the nearest whole number.

For factor K_2, see Table 3.

6.1.4 Design tyre section height, H

The design tyre section height H is equal to the product of the nominal section width S_N and the nominal aspect ratio H/S divided by 100:

$$H = S_N \cdot \frac{H/S}{100}$$

6.1.5 Design tyre overall diameter, D_o

The design tyre overall diameter D_o is equal to the nominal rim diameter D_r plus twice the tyre section height H:

$$D_o = D_r + 2H$$

For those tyres using a rim diameter code comprising 1 or 2 digits, see Table 1 for the value of D_r, in millimetres, to be used.

6.2 Calculation of "minimum overall tyre dimensions"

6.2.1 Minimum overall width, W_{min}

The minimum overall width W_{min} is equal to the product of the design tyre section width S and the appropriate coefficient c (see Table 3):

$$W_{min} = S \cdot c$$

6.2.2 Minimum overall diameter, $D_{o,min}$

The minimum overall diameter $D_{o,min}$ is equal to the nominal rim diameter D_r plus twice the product of design tyre section height H and the appropriate coefficient d (see Table 3):

$$D_{o,min} = D_r + 2H \cdot d$$

6.3 Calculations of "maximum overall tyre dimensions in service"

6.3.1 General

These calculations are for use by vehicle manufacturers in designing for tyre clearance.

6.3.2 Maximum overall width in service, W_{max}

The maximum overall width in service W_{max} is equal to the product of the design tyre section width S and the appropriate coefficient a (see Table 3):

$$W_{max} = S \cdot a$$

It includes protective ribs, lettering, embellishments, manufacturing tolerances and growth due to service.

6.3.3 Maximum overall diameter in service, $D_{o,max}$

The maximum overall diameter in service $D_{o,max}$ is equal to the nominal rim diameter D_r plus twice the product of the design tyre section height H and the appropriate coefficient b (see Table 3):

$$D_{o,max} = D_r + 2H \cdot b$$

It includes manufacturing tolerances, the different types of tread patterns (see footnote to Table 3) and growth due to service.

6.4 Coefficients for calculation of tyre dimensions

For all types of tyres (for tractor drive, tractor steer, implement and garden tractor wheels) of all structures (bias-belted, diagonal/bias and radial construction) with nominal aspect ratio $H/S \geqslant 50$ mounted on 5° tapered rims, the coefficients for the calculation of tyre dimensions shall be as given in Table 3.

For tyres with ratio $H/S < 50$ and/or different-concept tyres and rims, other coefficients will be defined.

Table 3 — Coefficients for calculation of tyre dimensions

Structure	Tyre construction code	Coefficients					
		K_1	K_2	a	b[a]	c	d
Bias-belted	B	0,8	0,4	1,08	1,07	0,96	0,97
Diagonal/bias	D						
Radial	R			1,05	1,04		

[a] Values are based on regular service tyres. The user should recognize that deep treads and corresponding increased overall diameters may be used for certain specialized tyres.

7 Tyre dimensions

For the relevant dimensions of tyres (metric series) for traction wheels and steering wheels of agricultural tractors and machines, and for agricultural implements, see Annex A.

8 Method of measurement of tyre dimensions

Before being measured, the tyre shall be mounted on its measuring rim, inflated with air or nitrogen to the recommended pressure, and allowed to stand for a minimum of 24 h at normal room temperature, after which the inflation pressure shall be readjusted to the original value.