ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 666

MOUNTING OF PLAIN GRINDING WHEELS
BY MEANS OF HUB FLANGES

1st EDITION
February 1968

BRIEF HISTORY

The ISO Recommendation R 666, *Mounting of plain grinding wheels by means of hub flanges*, was drawn up by Technical Committee ISO/TC 39, *Machine tools*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1951 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In February 1966, this Draft ISO Recommendation (No. 984) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Austria	Israel	Sweden
Belgium	Italy	Switzerland
Brazil	Japan	Turkey
Chili	Korea, Rep. of	U.A.R.
Czechoslovakia	Netherlands	United Kingdom
France	Poland	U.S.S.R.
Hungary	Portugal	Yugoslavia
India	Spain	

Two Member Bodies opposed the approval of the Draft:

Germany
U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in February 1968, to accept it as an ISO RECOMMENDATION.

MOUNTING OF PLAIN GRINDING WHEELS
BY MEANS OF HUB FLANGES

1. SCOPE

The object of this ISO Recommendation, which applies to the mounting of grinding wheels by means of hub flanges, is to specify, having regard to safety requirements, the dimensions of interchangeability between hub flanges and grinding wheels.

It is applicable to the following types of plain grinding wheels, having bores between 76.2 and 508 mm (3 and 20 in):

— fettling and sharpening plain wheels,

— plain wheels for external cylindrical grinding (except centreless),

— surface plain grinding wheels.

The requirements of this ISO Recommendation provide for complete interchangeability between the components (grinding wheels and hub flanges) regardless of whether they are manufactured to metric or inch dimensions.

2. GENERAL

The dimensions specified in this ISO Recommendation, together with the manufacturing requirements and checks to be made before use given below, have been determined taking into account the conditions necessary for ensuring safe assembly of the grinding wheels and the hub flanges, these conditions being as follows for the external diameter H of the hub flanges and for the radial width R of their gripping rim:

(a) The value of R should be great enough to ensure a sufficient contact surface, but small enough to maintain a sufficient clamping pressure and to reduce the risks of abnormal stress due to imperfect flatness of the grinding wheel.

(b) The difference between the internal diameter $H - 2R$ of the gripping rim and the bore A of the grinding wheel should be equal to at least 12 mm ($^1/_2$ in).

(c) The difference between the recess diameter of recessed grinding wheels and the diameter H of the hub flanges should be equal to at least 10 mm ($^3/_8$ in).

Important Note. — It is considered essential that the regulations in force at the present time in various countries should be brought into line with the safety requirements thus defined, particularly with regard to the values of dimensions R and H. The retention of values of H greater than those given in this ISO Recommendation, far from improving safety, would have the opposite effect, and would adversely affect both the interchangeability and the satisfactory use of the grinding wheel.

3. MANUFACTURING REQUIREMENTS

3.1 Gripping rim

The value R of the radial width of the gripping rim should be within $\pm$ 1.5 mm ($^1/_{16}$ in).

3.2 Thickness of flanges

The thickness of flanges should be determined in such a way that its effective thickness at the point of maximum stress, after allowing in particular for the depth of grooves and slots, should not be below a minimum B, taking into account the nature of metal and the design of the machine.

The values of B, in Tables 1 and 2 are given, for guidance only, for use of steel flanges on machines of normal power, of about 10 and 15 metric horsepower* for example, for grinding wheels of 500 and 600 mm (20 and 24 in) diameter, and 20 and 30 metric horsepower**, for grinding wheels of 750 and 900 mm (30 and 36 in) diameter; these values should be multiplied by approximately the square root of the power ratio when machines of appreciably higher power are used.

3.3 Dimensions L and Q

The dimensions L, the nominal diameter of the loose flange bore and Q, the length of the fixed flange hub, are not standardized, as they are a function of the dimensions of the shaft end of the machine.

Nevertheless the following requirements should be met:

— for dimension L a tolerance of grade 8 or finer, with fit H for the loose flange and f (or even e or d) for the fixed flange.

— for dimension Q a value always at least 6 mm ($^1/_4$ in) greater than the greatest thickness of the wheel to be gripped.

3.4 Machining of the loose flange bore

In order to allow a certain freedom of self-orientation of the loose flange during gripping, the bore should be machined with a cylindrical entry of diameter L, on the side of the wheel, of maximum length 5 mm ($^3/_{16}$ in) followed by a small tapered (see Figure) or cylindrical part.

3.5 Tolerances on A

Loose flange: a 11,

Fixed flange: f 7 (or e 7) for plain wheels for external cylindrical grinding and for surface plain grinding wheels,

d 8 for fettling and sharpening plain wheels.

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* In SI units $\approx$ 7.35 and 11.03 kW.
** In SI units $\approx$ 14.70 and 22.06 kW.

4. CHECKS BEFORE USE

4.1 It should be checked, before assembly, that the external diameter of the grinding wheel does not exceed the limits which have been taken into consideration for the determination of the dimensions of the flanges (see Tables 1 and 2).

4.2 It should also be checked, in the case of recessed grinding wheels, that the recessed diameter is at least 10 mm ($^3/_8$ in) greater than the external diameter H of the hub flanges.

4.3 It should lastly be checked that the clamping torques are in accordance with the safety regulations relating to the use of grinding wheels.

TABLE 1 — Dimensions in millimetres

Grinding wheels		Flanges						Screws	
A	D	H	R	B B_1	N	S	$V*$	P	Number and diameters
76.2	250-300	115	12	11	12	4	19	65	6 × M 6
127	250-300	165	12	11	12	4	19	110	6 × M 8
	350-400	175	16	13	16	6	25	110	6 × M 10
	450-500	185	20	16	20	6	29	110	8 × M 10
152.4	400	200	16	13	16	6	25	130	6 × M 10
	450-500	210	20	16	20	6	29	130	8 × M 10
203.2	450-500	260	20	16	20	6	29	180	8 × M 12
	600	260	20	16	25	6	35	180	8 × M 12
304.8	500	365	20	16	20	6	29	280	8 × M 16
	600	365	20	16	25	6	35	280	8 × M 16
	750	380	25	19	25	6	35	280	8 × M 16
	900	380	25	22	25	6	35	280	8 × M 16
	1060	380	25	22	25	6	35	280	10 × M 16
508	1250	600	32	25	25	6	35	480	10 × M 20

TABLE 2 — Dimensions in inches

Grinding wheels		Flanges						Screws	
A	D	H	R	B B_1	N	S	$V*$	P	Number and diameters
3	10-12	$4\,^1/_2$	$^1/_2$	$^7/_{16}$	$^1/_2$	$^1/_8$	$^3/_4$	$2\,^1/_2$	6 × $^1/_4$
5	10-12	$6\,^1/_2$	$^1/_2$	$^7/_{16}$	$^1/_2$	$^1/_8$	$^3/_4$	$4\,^1/_4$	6 × $^5/_{16}$
	14-16	$6\,^7/_8$	$^5/_8$	$^1/_2$	$^5/_8$	$^1/_4$	1	$4\,^1/_4$	6 × $^3/_8$
	18-20	$7\,^1/_4$	$^3/_4$	$^5/_8$	$^3/_4$	$^1/_4$	$1\,^1/_8$	$4\,^1/_4$	8 × $^3/_8$
6	16	$7\,^7/_8$	$^5/_8$	$^1/_2$	$^5/_8$	$^1/_4$	1	$5\,^1/_8$	6 × $^3/_8$
	18-20	$8\,^1/_4$	$^3/_4$	$^5/_8$	$^3/_4$	$^1/_4$	$1\,^1/_8$	$5\,^1/_8$	8 × $^3/_8$
8	18-20	$10\,^1/_4$	$^3/_4$	$^5/_8$	$^3/_4$	$^1/_4$	$1\,^1/_8$	7	8 × $^1/_2$
	24	$10\,^1/_4$	$^3/_4$	$^5/_8$	1	$^1/_4$	$1\,^3/_8$	7	8 × $^1/_2$
12	20	$14\,^3/_8$	$^3/_4$	$^5/_8$	$^3/_4$	$^1/_4$	$1\,^1/_8$	11	8 × $^5/_8$
	24	$14\,^3/_8$	$^3/_4$	$^5/_8$	1	$^1/_4$	$1\,^3/_8$	11	8 × $^5/_8$
	30	15	1	$^3/_4$	1	$^1/_4$	$1\,^3/_8$	11	8 × $^5/_8$
	36	15	1	$^7/_8$	1	$^1/_4$	$1\,^3/_8$	11	8 × $^5/_8$
	42	15	1	$^7/_8$	1	$^1/_4$	$1\,^3/_8$	11	10 × $^5/_8$
20	48	$23\,^5/_8$	$1\,^1/_4$	1	1	$^1/_4$	$1\,^3/_8$	19	10 × $^3/_4$

* V = Minimum thickness capable of being gripped (minimum web thickness, in the case of recessed grinding wheels).