
**Solid (monobloc) gear hobs with tenon
drive or axial keyway, 0,5 to 40 module —
Nominal dimensions**

*Fraises-mères monoblocs à entraînement par tenon ou par clavette, de
modules 0,5 à 40 — Dimensions nominales*

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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 2490 was prepared by Technical Committee ISO/TC 60, *Gears*, Subcommittee SC 1, *Nomenclature and wormgearing*.

This third edition cancels and replaces the second edition (ISO 2490:1996), of which Tables 1 and 2, Figure 1 and Annex A have been technically revised.

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Solid (monobloc) gear hobs with tenon drive or axial keyway, 0,5 to 40 module — Nominal dimensions

1 Scope

This International Standard specifies the nominal dimensions of general-purpose single-start solid (monobloc) gear hobs with axial keyway or tenon drive of 0,5 to 40 module.

These hobs are intended for the production of gears which conform to ISO 54 and present a 20° pressure angle in conformity with ISO 53.

NOTE Solid hobs are those made from one solid piece of material, as opposed to hobs which have inserted blades.

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 53:1998, *Cylindrical gears for general and heavy engineering — Standard basic rack tooth profile*

ISO 54:1996, *Cylindrical gears for general engineering and for heavy engineering — Modules*

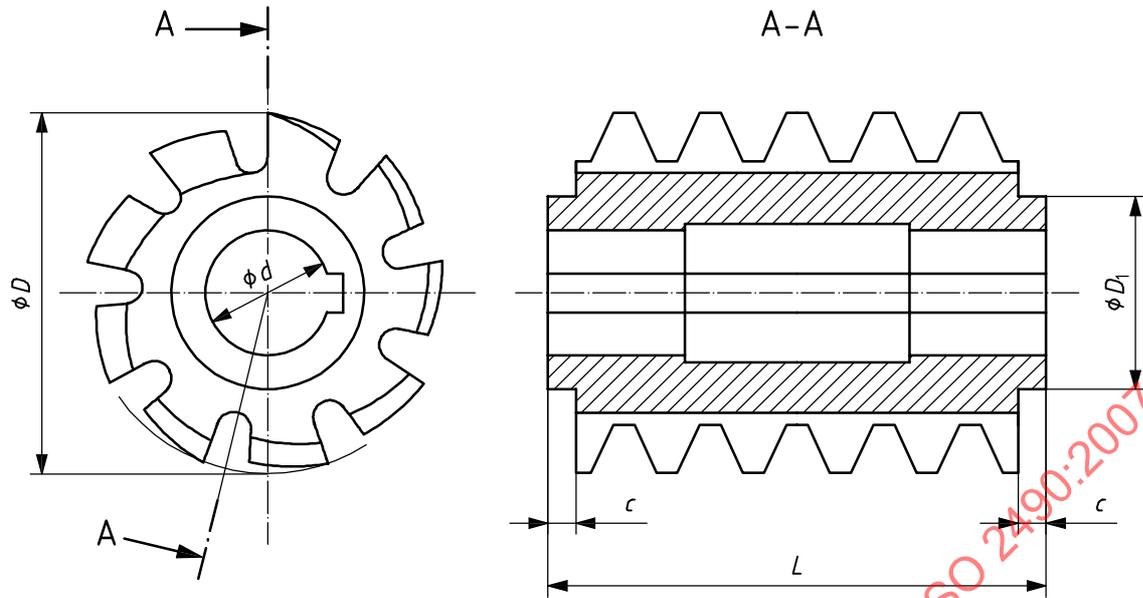
ISO 240:1994, *Milling cutters — Interchangeability dimensions for cutter arbors or cutter mandrels*

ISO 2768-1:1989, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

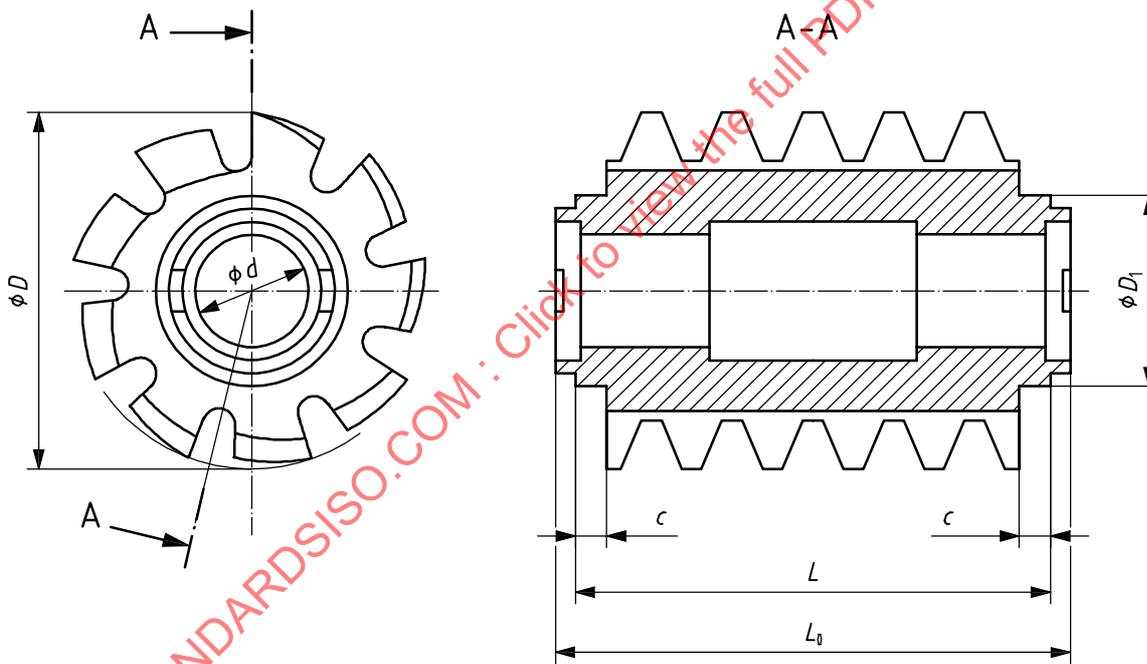
ISO 2780:1986, *Milling cutters with tenon drive — Interchangeability dimensions with cutter arbors — Metric series*

3 Nominal dimensions

The nominal dimensions shall be as shown in Figure 1 and given in Tables 1 and 2.



a) Hob with axial keyway



b) Hob with tenon drive

Key

- $\varnothing D_1$ hub diameter (mm)
- $\varnothing D$ outside diameter (mm)
- $\varnothing d$ bore diameter (mm)
- L overall length of hob with axial keyway (mm)
- L_0 overall length of hob with tenon drive (mm)
- c minimum hub length (mm)

NOTE Keyway dimensions are specified in ISO 240 and tenonway dimensions are specified in ISO 2780.

Figure 1 — Gear hob dimensions

Table 1 — Nominal dimensions of small-bore-type single-thread gear hobs

Type ^b	Module, m		Hub diameter D_1 mm	Outside diameter D^a mm	Bore diameter d^b mm	Reference			
	Series					Overall length L^a mm	Overall length L_0^a mm	Minimum hub length c mm	Typical number of gashes
	I	II							
1	0,5	—	Diameter at manufacturer's discretion	24	8	10	—	1	12
	—	0,55		24	8	10	—	1	12
	0,6	—		24	8	10	—	1	12
	—	0,7		24	8	10	—	1	12
	—	0,75		24	8	12	—	1	12
	0,8	—		24	8	12	—	1	12
	—	0,9		24	8	12	—	1	12
	1,0	—		24	8	12	—	1	12
2	0,5	—		32	10	20	30	2	12
	—	0,55		32	10	20	30	2	12
	0,6	—		32	10	20	30	2	12
	—	0,7		32	10	20	30	2	12
	—	0,75		32	10	20	30	2	12
	0,8	—		32	10	20	30	2	12
	—	0,9		32	10	20	30	2	12
	1,0	—		32	10	20	30	2	12
	—	1,125		32	10	20	30	2	12
	1,25	—		40	10	25	35	2	10
	—	1,375		40	10	25	35	2	10
	1,50	—		40	10	25	35	2	10
	—	1,75		40	10	30	40	2	10
	2,0	—		40	10	30	40	2	10
3	0,5	—		32	13	20	30	2	12
	—	0,55		32	13	20	30	2	12
	0,6	—	32	13	20	30	2	12	
	—	0,7	32	13	20	30	2	12	
	—	0,75	32	13	20	30	2	12	
	0,8	—	32	13	20	30	2	12	
	—	0,9	32	13	20	30	2	12	
	1,0	—	32	13	20	30	2	12	
	—	1,125	32	13	20	30	2	12	
	1,25	—	40	13	25	35	2	10	
	—	1,375	40	13	25	35	2	10	
	1,5	—	40	13	25	35	2	10	
	—	1,75	40	13	30	40	2	10	
	2,0	—	40	13	30	40	2	10	

^a Tolerances of outside diameter, D , L and L_0 shall be the "coarse" class as given in ISO 2768-1.

^b The type is the segmentation based on the bore diameters.

Table 2 — Nominal dimensions of single-thread gear hobs

Module, <i>m</i>		Hub diameter <i>D</i> ₁ mm	Outside diameter <i>D</i> ^a mm	Bore diameter <i>d</i> ^b mm	Reference			
Series					Overall length <i>L</i> ^a mm	Overall length <i>L</i> ₀ ^a mm	Minimum hub length <i>c</i> mm	Typical number of gashes
I	II							
1	—	Diameter at manufacturer's discretion	50	22	50	65	4	14
—	1,125		50	22	50	65	4	14
1,25	—		50	22	50	65	4	14
—	1,375		50	22	50	65	4	14
1,5	—		55	22	55	70	4	14
—	1,75		55	22	55	70	4	14
2	—		65	27	60	75	4	14
—	2,25		65	27	60	75	4	14
2,5	—		70	27	65	80	4	14
—	2,75		70	27	65	80	4	14
3	—		75	32	70	85	4	14
—	3,5		80	32	75	90	4	14
4	—		85	32	80	95	4	14
—	4,5		90	32	85	100	4	14
5	—		95	32	90	105	4	14
—	5,5		100	32	95	110	5	12
6	—		105	32	100	115	5	12
—	6,5		110	32	110	125	5	12
—	7		115	32	115	130	5	12
8	—		120	32	140	160	5	10
—	9		125	32	140	160	5	10
10	—		130	32	170	190	5	10
—	11		150	40	170	190	6	9
12	—		160	40	200	220	6	9
—	14		180	40	200	220	6	9
16	—		200	50	250	275	6	9
—	18		220	50	250	275	6	9
20	—		240	60	300	325	6	9
—	22		250	60	300	325	6	9
25	—		280	60	360	385	6	9
—	28		320	80	400	430	6	9
32	—		350	80	450	480	6	9
—	36		380	80	450	480	6	9
40	—		400	80	480	510	6	9

^a Tolerances of dimensions *D*, *L* and *L*₀ shall be the "coarse" class as given in ISO 2768-1.

^b ISO 2780 (tenonway dimensions) only gives values for bores up to 50 mm in diameter.

Annex A
(informative)

Multiple thread hobs

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Table A.1 — Small-bore gear hob outside diameters and lead angles (multi-threads)

Type ^c	Module, <i>m</i>		Number of threads, <i>z</i> ₀												
	Series		All			1			2			3			
	I	II	Hub diameter <i>D</i> ₁	Outside diameter <i>D</i>	Bore diameter <i>d</i>	Lead angle <i>γ</i> ₀	Outside diameter <i>D</i>	Bore diameter <i>d</i>	Lead angle <i>γ</i> ₀	Outside diameter <i>D</i>	Bore diameter <i>d</i>	Lead angle <i>γ</i> ₀	Outside diameter <i>D</i>	Bore diameter <i>d</i>	Lead angle <i>γ</i> ₀
1	0,5	—	Diameter at manufacturer's discretion	24	8	1,259	32	10	1,864	32	10	1,864	32	10	2,796
	—	0,55		24	8	1,393	32	10	2,058	32	10	2,058	32	10	3,088
	0,6	—		24	8	1,528	32	10	2,255	32	10	2,255	32	10	3,383
	—	0,65		24	8	1,665	32	10	2,453	32	10	2,453	32	10	3,681
	—	0,7		24	8	1,803	32	10	2,653	32	10	2,653	32	10	3,981
	—	0,75		24	8	1,943	32	10	2,854	32	10	2,854	32	10	4,283
	0,8	—		24	8	2,084	32	10	3,057	32	10	3,057	32	10	4,589
	—	0,9		24	8	2,372	32	10	3,469	32	10	3,469	32	10	5,207
	1	—		24	8	2,666	32	10	3,887	32	10	3,887	32	10	5,837
	—	0,5		32	10	0,932	32	10	1,864	32	10	1,864	32	10	2,796
	—	0,55		32	10	1,029	32	10	2,058	32	10	2,058	32	10	3,088
	2 and 3	0,6		—	32	10	1,127	32	10	2,255	32	10	2,255	32	10
—		0,65	32	10	1,226	32	10	2,453	32	10	2,453	32	10	3,681	
—		0,7	32	10	1,326	32	10	2,653	32	10	2,653	32	10	3,981	
—		0,75	32	10	1,427	32	10	2,854	32	10	2,854	32	10	4,283	
0,8		—	32	10	1,528	32	10	3,057	32	10	3,057	32	10	4,589	
—		0,9	32	10	1,734	32	10	3,469	32	10	3,469	32	10	5,207	
1		—	32	10	1,943	32	10	3,887	32	10	3,887	32	10	5,837	
—		1,125	32	10	2,209	32	10	4,421	32	10	4,421	32	10	6,640	

Table A.1 (continued)

Type ^c	Module, <i>m</i>		Number of threads, <i>z</i> ₀											
	I	II	1				2				3			
Series	All		Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^{a, b} <i>γ</i> ₀ °	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^{a, b} <i>γ</i> ₀ °	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^{a, b} <i>γ</i> ₀ °	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^{a, b} <i>γ</i> ₀ °
2 and 3 (cont)	1,25	—	40	10	1,943	40	10	3,887	40	10	5,837	40	10	5,837
	—	1,375	40	10	2,155	40	10	4,313	40	10	6,478	40	10	6,478
	1,5	—	40	10	2,372	40	10	4,747	40	10	7,131	40	10	7,131
	—	1,75	40	10	2,816	40	10	5,638	40	10	8,474	40	10	8,474
	2	—	40	10	3,276	40	10	6,562	40	10	9,871	40	10	9,871
			Hub diameter <i>D</i> ₁		Lead angle ^{a, b} <i>γ</i> ₀ °		Lead angle ^{a, b} <i>γ</i> ₀ °		Lead angle ^{a, b} <i>γ</i> ₀ °		Lead angle ^{a, b} <i>γ</i> ₀ °		Lead angle ^{a, b} <i>γ</i> ₀ °	
			Diameter at manufacturers discretion		Bore diameter <i>d</i> mm		Bore diameter <i>d</i> mm		Bore diameter <i>d</i> mm		Bore diameter <i>d</i> mm		Bore diameter <i>d</i> mm	

^a Axial gashing is normally up to a 6° lead angle.

^b The lead angle of the gear hob is calculated from the formula:

$$\sin \gamma_0 = \frac{m \times z_0}{D - 2h_{a0}}$$

where

- γ*₀ is the lead angle of the gear hob;
- m* is the module;
- z*₀ is the number of threads on the gear hob;
- D* is the outside diameter of the gear hob;
- h*_{a0} is the addendum of the gear hob (in conformity with ISO 53).

^c The type is the segmentation based on the bore diameters.

Table A.2 — Gear hob outside diameters and lead angles (multi-threads)

Module, <i>m</i>	Number of threads, <i>z</i> 0												
	1			2			3			4			
Series	Hub diameter <i>D</i> ₁	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^b γ 0 °	Maximum number of gashes ^a <i>N</i>	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^b γ 0 °	Maximum number of gashes ^a <i>N</i>	Outside diameter <i>D</i> mm	Bore diameter <i>d</i> mm	Lead angle ^b γ 0 °	Maximum number of gashes ^a <i>N</i>
I	II	50	22	1,206	16	55	22	2,183	17	60	22	2,991	18
1	—	50	22	1,366	16	55	22	2,471	17	60	22	3,383	18
—	1,125	50	22	1,528	16	55	22	2,762	17	60	22	3,780	18
1,25	—	50	22	1,692	16	55	22	3,057	17	65	27	3,842	19
—	1,375	55	22	1,677	16	60	22	3,057	17	70	27	3,895	19
1,5	—	55	22	1,981	16	60	22	3,608	17	80	32	3,981	20
—	1,75	65	27	1,910	16	70	27	3,528	17	90	32	4,048	20
2	—	65	27	2,172	15	80	32	3,469	17	100	32	4,101	22
—	2,25	70	27	2,247	15	85	32	3,640	18	110	32	4,145	22
2,5	—	70	27	2,497	15	85	32	4,037	18	110	32	4,589	22
—	2,75	75	32	2,547	15	90	32	4,171	18	115	32	4,802	22
3	—	80	32	2,816	14	100	32	4,400	18	125	32	5,182	22
—	3,5	85	32	3,057	14	115	32	4,370	19	140	32	5,296	22
4	—	90	32	3,276	14	120	32	4,747	19	150	40	5,584	22
—	4,5	95	32	3,475	14	125	32	5,100	19	160	40	5,837	22
5	—	100	32	3,656	13	135	32	5,205	19	170	40	6,062	22
—	5,5	105	32	3,823	13	140	32	5,509	18	175	40	6,459	22
6	—	110	32	3,976	13	150	40	5,578	18	175	40	6,459	22
—	6,5	115	32	4,117	13	155	40	5,844	18	175	40	6,459	22
—	7	120	32	4,589	12	160	40	6,562	17	175	40	6,459	22
8	—	125	32	5,037	12	170	40	7,010	16	175	40	6,459	22
—	9	130	32	5,465	12	180	40	7,414	16	175	40	6,459	22
10	—	150	40	5,152	11	200	50	7,327	16	175	40	6,459	22
—	11	160	40	5,296	11	210	50	7,662	15	175	40	6,459	22
12	—	180	40	5,541	10	240	60	7,850	15	175	40	6,459	22
—	14	200	50	5,739	10	270	60	7,998	15	175	40	6,459	22
16	—	220	50	5,904	10	—	—	—	—	—	—	—	—
—	18	240	60	6,042	10	—	—	—	—	—	—	—	—
20	—	250	60	6,478	10	—	—	—	—	—	—	—	—
—	22	280	60	6,600	10	—	—	—	—	—	—	—	—
25	—	320	80	6,431	10	—	—	—	—	—	—	—	—
—	28	350	80	6,807	9	—	—	—	—	—	—	—	—
32	—	380	80	7,131	9	—	—	—	—	—	—	—	—
—	36	400	80	7,662	9	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	—	—	—	—	—

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