
**Geometrical Product Specifications
(GPS) — Series of angles and slopes on
prisms**

*Spécification géométrique des produits (GPS) — Séries d'angles et
d'inclinaisons de prismes*

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Foreword

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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.

International Standard ISO 2538 was prepared by the Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*.

This second edition cancels and replaces the first edition (ISO 2538:1974), of which the tables have been corrected and updated, but not technically modified.

Annexes A and B of this International Standard are for information only.

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Introduction

This International Standard is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO/TR 14638). It influences chain links 1 and 2 of the chain of standards on angle.

For more detailed information of the relation of this International Standard to other standards and the GPS matrix model, see annex A.

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Geometrical Product Specifications (GPS) — Series of angles and slopes on prisms

1 Scope

This International Standard specifies two series of prism angles from 120° to 0° 30' and a series of prism slopes from 1:10 to 1:500, for general mechanical engineering purposes.

2 Definitions

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For the purposes of this International Standard, the following definitions apply.

2.1

prism

part of a piece which is limited by two intersecting planes

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See figure 1.

NOTE — Both planes are termed "prism planes". When these are intended for fits, they are termed "mating planes for the prism".

2.2

multiple prism

part of a piece which is limited by several pairs of intersecting planes

See figure 2.

NOTES

- 1 A double prism is limited by two pairs of intersecting planes.
- 2 When the intersection of each pair of planes is a point, the multiple prism is a pyramid (see figure 3).

2.3

wedge

prism with a small angle

2.4

slide prism

vee-block

dovetail

typical prism with a large angle

NOTE — These special prisms are used, for example, as a slideway on machine tools (see figures 4 and 5).

2.5 prism angle

β
angle at which both prism planes intersect each other

See figure 1.

NOTE — The angle between the mating surfaces for prism is called "mating angle for prism".

2.6 prism slope

S
ratio of the difference between the heights H and h in two determined cross-sections to the distance L between both cross-sections

$$S = \frac{H-h}{L} = \tan \beta$$

See figure 6.

2.7 rate of prism

C_P
ratio of the difference between the thicknesses T and t in two determined cross-sections to the distance L between both cross-sections

$$C_P = \frac{T-t}{L} = 2 \tan \frac{\beta}{2}$$

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See figure 7.

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2.8 prism edge

theoretical intersection line of both prism planes

2.9 centre plane of prism

E_M
plane passing through the prism edge which bisects the prism angle β

2.10 height of prism

height measured at a given cross-section which is parallel to the edge and perpendicular to one prism plane

See figure 6.

2.11 thickness of prism

thickness measured at a given cross-section which is parallel to the edge and perpendicular to the prism centre plane

See figure 7.

3 Values

Angle series 1 and 2 as specified in table 1 are to be used in this order of preference.

Table 2 is only to be used for special applications as mentioned in the last column.

Table 3 shows the calculated values for slope and angle respectively and rate, corresponding to each recommended prism angle and prism slope.

Table 1 — General purpose prisms

Prism angle				Prism slope <i>S</i>
Series 1		Series 2		
β	$\beta/2$	β	$\beta/2$	
120°	60°	—	—	—
90°	45°	—	—	—
—	—	75°	37° 30'	—
60°	30°	—	—	—
45°	22° 30'	—	—	—
—	—	40°	20°	—
30°	15°	—	—	—
20°	10°	—	—	—
15°	7° 30'	—	—	—
—	—	10°	5°	—
—	—	8°	4°	—
—	—	7°	3° 30'	—
—	—	6°	3°	—
—	—	—	—	1:10
5°	2° 30'	—	—	—
—	—	4°	2°	—
—	—	3°	1°	—
—	—	—	—	1:20
—	—	2°	1°	—
—	—	—	—	1:50
—	—	1°	0° 30'	—
—	—	—	—	1:100
—	—	0° 30'	0° 15'	—
—	—	—	—	1:200
—	—	—	—	1:500

Table 2 — Special purpose prisms

Prism angle		Application
β	$\beta/2$	
	54°	Vee-blocks
72°	36°	
50°	25°	Dovetails

Table 3 — Calculated values

Basic value		Calculated value		
β	S	C_p	S	β
120°	—	1:0,288 675	—	—
108°	—	1:0,363 271	—	—
90°	—	1:0,500 000	—	—
75°	—	1:0,651 613	1:0,267 949	—
60°	—	1:0,866 025	1:0,577 350	—
50°	—	1:1,072 253	1:0,839 100	—
45°	—	1:1,207 107	1:1,000 000	—
40°	—	1:1,373 739	1:1,191 754	—
30°	—	1:1,866 025	1:732 051	—
20°	—	1:2,835 641	1:2,747 477	—
15°	—	1:3,797 877	1:3,732 051	—
10°	—	1:5,715 026	1:5,671 282	—
8°	—	1:7,150 33	1:7,115 370	—
7°	—	1:8,174 928	1:8,144 346	—
6°	—	1:9,540 568	1:9,514 364	—
—	1:10	—	—	5°42'38,1"
5°	—	1:11,451 883	1:11,430 052	—
4°	—	1:14,318 127	1:14,300 666	—
3°	—	1:19,094 230	1:19,081 137	—
—	1:20	—	—	2°51'44,7"
2°	—	1:28,644 981	1:28,636 253	—
—	1:50	—	—	1°8'44,7"
1°	—	1:57,294 325	1:57,289 962	—
—	1:100	—	—	34'22,6"
0°30'	—	1:114,590 832	1:114,588 650	—
—	1:200	—	—	17'11,3"
—	1:500	—	—	6'52,5"

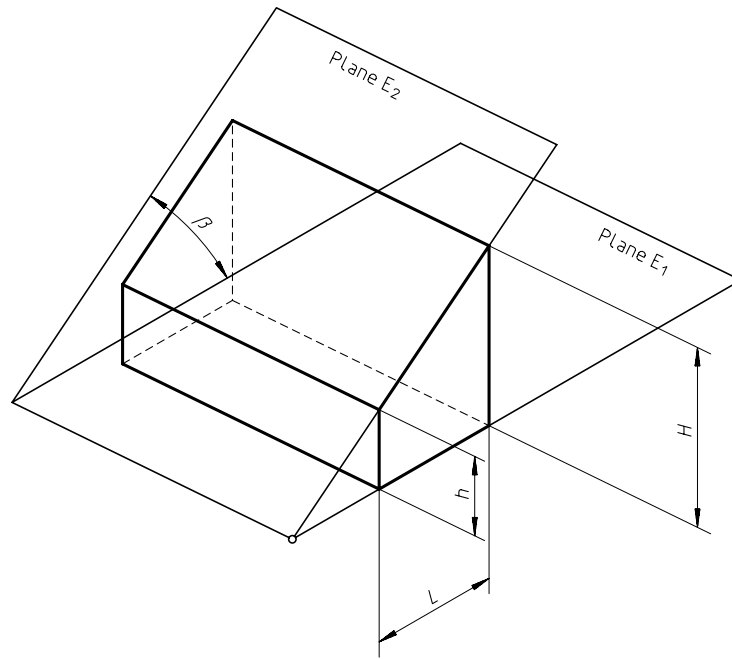


Figure 1 — Prism or wedge

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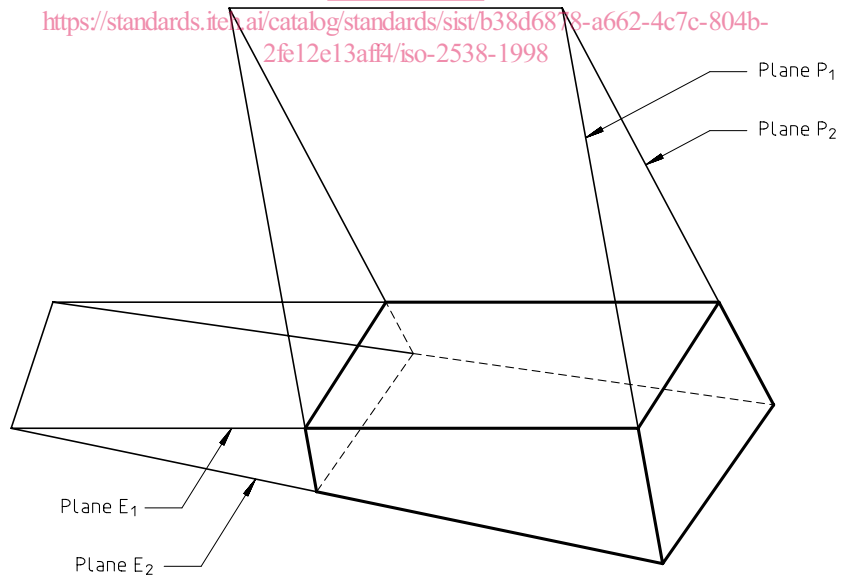


Figure 2 — Multiple (double) prism