Tensile Test Samples of ISO 37

Description

6 Test pieces

6.1 General

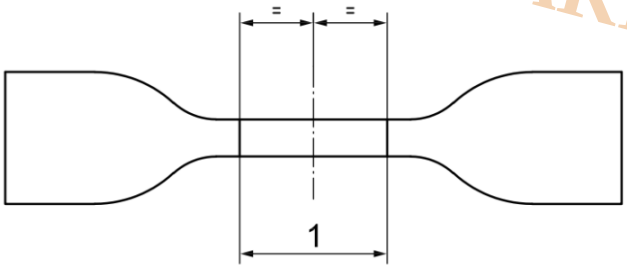
Miniature test pieces might give somewhat different, usually higher, values for tensile strength and elongation at break than the larger test pieces.

Seven types of test piece are provided, i.e. dumb-bell-shaped types 1, 2, 3, 4 and 1A and ring-shaped types A (normal) and B (miniature). The results obtained for a given material are likely to vary according to the type of test piece used, and the results obtained for different materials should therefore not be regarded as comparable unless the same type of test piece has been used.

When preparation of test pieces requires buffing or thickness adjustment, results might be affected.

6.2 Dumb-bells

Dumb-bell test pieces shall have the outline shown in Figure 2.



Key

1 test length (see Table 1)

Figure 2 — Shape of dumb-bell test pieces

The standard thickness of the narrow portion shall be 2,0 mm +- 0,2 mm for types 1, 2, 3 and 1A and 1,0 mm +- 0,1 mm for type 4.

The test length shall be in accordance with Table 1.

The other dimensions of the dumb-bells shall be as produced by the appropriate die (see Table 2).

For non-standard test pieces, e.g. those taken from finished products, the maximum thickness of the narrow portion shall be 3,0 mm for types 1 and 1A, 2,5 mm for types 2 and 3, and 2,0 mm for type 4.

Table 1 — Test length of dumb-bells

Type of test piece	Type 1	Type 1A	Type 2	Type 3	Type 4
Test length (mm)	25 ± 0,5	20 ± 0,5[a]	20 ± 0,5	10 ± 0,5	10 ± 0,5
[a] The test length shall not exceed the length of the narrow portion of the test piece (dimension C in Table 2).					

Type 3 and 4 dumb-bell test pieces shall only be used where insufficient material is available for the larger test pieces. These test pieces are particularly suitable for testing products and are used in certain product
standards, e.g. type 3 dumb-bells have been used for testing pipe sealing rings and cable coverings.

7.1 Dies and cutters

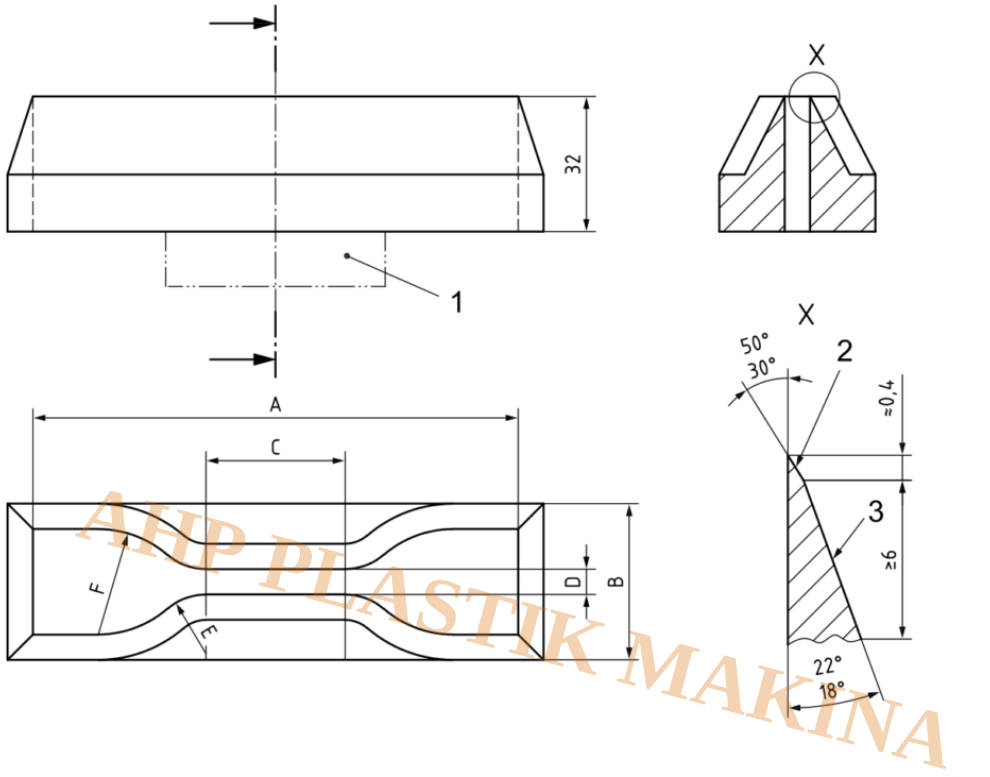
All dies and cutters used shall be in accordance with ISO 23529. Dies for preparation of dumb-bells shall have the dimensions given in Table 2 and Figure 3 except for the cutting edge for which Figure 3 only indicates a suitable geometry. The departure from parallelism at any point along the width of the narrow portion of the die shall nowhere exceed 0,05 mm.
For a method of cutting type B ring test pieces, see Annex A.

Table 2 — Dimensions of dies for dumb-bell test pieces

	Dimension	Type 1	Type 1A	Type 2	Type 3	Type 4
A	Overall length (minimum)[a] (mm)	115	100	75	50	35
B	Width of ends (mm)	25 ± 1	25 ± 1	12,5 ± 1	8,5 ± 0,5	6 ± 0,5
C	Length of narrow portion (mm)	33 ± 2	21 ± 1	25 ± 1	16 ± 1	12 ± 0,5
D	Width of narrow portion (mm)	6,2 ± 0,2	5 ± 0,1	4 ± 0,1	4 ± 0,1	2 ± 0,1
E	Transition radius outside (mm)	14 ± 1	11 ± 1	8 ± 0,5	7,5 ± 0,5	3 ± 0,1
F	Transition radius inside (mm)	25 ± 2	25 ± 2	12,5 ± 1	10 ± 0,5	3 ± 0,1

[a] A greater overall length might be necessary to ensure that only the wide end tabs come into contact with the machine grips, thus avoiding “shoulder breaks”.

Dimensions in millimetres



Key

1 method of fixing to suit machine
2 ground smooth
3 ground

NOTE 1 For dimensions A to F, see Table 2.

NOTE 2 The diagrams on the right show sections of typical fixed blades.

Figure 3 — Die for dumb-bell test pieces

Category

1. Equipment for Standards
2. Standards