INTERNATIONAL STANDARD

ISO 8526-1

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Modular units for machine tools — Workholding pallets —

Part 1: Workholding pallets up to 800 mm nominal size

Éléments standards pour machines-outils — Palettes —

Partie 1: Palettes porte-pièce de dimension nominale jusqu'à 800 mm

Reference number
ISO 8526-1 : 1990 (E)

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.

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 8526-1 was prepared by Technical Committee ISO/TC 39, *Machine tools.*

ISO 8526 consists of the following parts, under the general title *Modular units for machine tools — Workholding pallets*:

— *Part 1: Workholding pallets up to* 800 mm *nominal size*

— *Part 2: Workholding pallets of nominal size greater than* 800 mm

Annex A forms an integral part of this part of ISO 8526. Annex B is for information only.

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Introduction

This part of ISO 8526 has been drawn up to facilitate interchangeability of workholding pallets, including those from different manufacturers. It deals with square pallets and rectangular pallets of length-to-width ratio of 1,25 and of nominal size up to 800 mm.

If pallets with tighter tolerances than specified in this part of ISO 8526 are required, they shall be subject to agreement between the manufacturer and user.

This part of ISO 8526 does not specify the positioning accuracy of the pallets.

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Modular units for machine tools — Workholding pallets — Part 1: Workholding pallets up to 800 mm nominal size

1 Scope

This part of ISO 8526 specifies the dimensions of workholding pallets for use with machine tools and in manufacturing systems.

It applies to the following nominal sizes of pallet:

320 mm, 400 mm, 500 mm, 630 mm and 800 mm

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8526. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8526 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2 : 1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

ISO 299 : 1987, *Machine tool tables — T-slots and corresponding bolts.*

ISO 1101 : 1983, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

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

3 Terminology

3.1 Nominal size

The nominal size is given by dimension a_1 (see figure 3).

3.2 General

The terms used for the purposes of this part of ISO 8526 are listed in table 1 and illustrated in figure 1.

Table 1 — Terminology

Reference number	Designation
1	Top surface of pallet
2	Centre hole
3	Location surface
4	Clamping surface
5	Transportation slide surface
6	Location hole
7	Edge locator (when fitted)
8	Alignment hole (when provided)
9	Fixing holes for latch mechanism
10	Resting surface

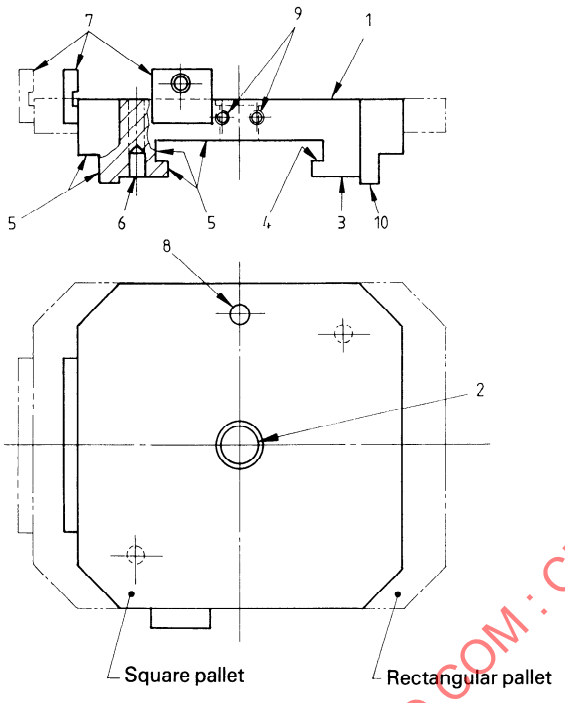


Figure 1 — Workholding pallet

4 Dimensions

Dimensions of pallets are given in table 2.

5 Top surface

5.1 Corners

Corners shall be removed from pallets (see dimension c in table 2).

5.2 T-slots and threaded holes

Either T-slots or threaded holes may be provided in the top surface. Pitches of threaded holes and T-slots and T-slot dimensions shall comply with ISO 299. Dimensions and pitches of T-slots and threaded holes are given in table 2.

NOTES

1 The top surface may be left plain, if desired, for special applications.

2 Radial slots may be used for special applications. Their dimensions are given in annex A, tables A.1 and A.2.

5.3 Types of top surface

The different types of top surface are as follows:

— type 1: surface with threaded holes [see figure 2a)];

— type 2: surface with T-slots [see figure 2b)];

— type 3: surface with T-slots and cross-tenons [see figure 2c)];

— type 4: plain surface (see figure 5);

— type 5: surface with radial T-slots (see figure A.1);

— type 6: surface with twin radial T-slots (see figure A.2).

5.4 Centre hole

A centre hole shall be provided and may be used as a reference hole for work positioning on the pallet and/or as a reference hole for pallet manufacturing (see figure 1).

The depth of the counterbore, d_4, if present, shall always be greater than the depth of the central tenon slot of the pallet.

5.5 Alignment hole

An alignment hole, d_6, may be provided for use in positioning the workpiece or fixture on the pallet and/or as a reference hole for pallet manufacturing purposes (see figure 1).

NOTE — It is necessary to provide means of preventing ingress of swarf and coolant to the bottom surface.

6 Location of workpiece

Workpieces or fixtures shall be located on the top surface by one of the following methods:

a) by means of edge locators (see figure 4 and table 3);

NOTE — For type 2 and type 3 top surfaces, the mounting holes for the edge locators are at the discretion of the manufacturer. The positions of the fixing holes for the fixture should be the same as those shown in figure 4.

b) by means of a centre hole and an associated alignment hole (where the top surface of the pallet has threaded holes) [see figure 2a)];

c) by means of a centre hole and a reference slot (where the top surface of the pallet has T-slots) [see figure 2b)];

d) by means of two perpendicular tenon (crossed-tenon) slots [see figure 2c)];

e) by means of two straight-through location holes, d_3 or d_{10} (see figure 3, sections X-X and Z-Z).

NOTES

1 It is necessary to provide means of preventing ingress of swarf and coolant to the bottom surface.

2 The straight-through feature is optional.

7 Bottom surface

7.1 Location of pallet on the receiver (on the machine tool)

Location of the pallet on the receiver shall be by means of one of the following methods (see figure 3):

a) by two cylindrical holes on the pallet (see figure 3, section X-X) and two cylindrical pins on the receiver;

b) by two tapered holes on the pallet (see figure 3, section Z-Z) and two tapered pins on the receiver.

7.2 Shape and dimensions

The shape and dimensions of the bottom surface are given in figure 3 and table 2.

8 Designation of pallets

The designation of a pallet is given by

— the number of this part of ISO 8526;

— its nominal size and length, $a_1 \times a_1$ or $a_1 \times a_2$;

— its top surface type (see 5.3);

— the pitch of its T-slots or threaded holes;

— the method of workpiece location [see clause 6, a) to e)];

— the method of locating the pallet on the receiver [see 7.1, a) and b)].

EXAMPLE

Designation of a square pallet, of nominal size and length 500 × 500, with top surface type 2, with 100 mm pitch of T-slots, with workpiece location by means of centre hole and reference slot c), and pallet location on the receiver by means of cylindrical holes a):

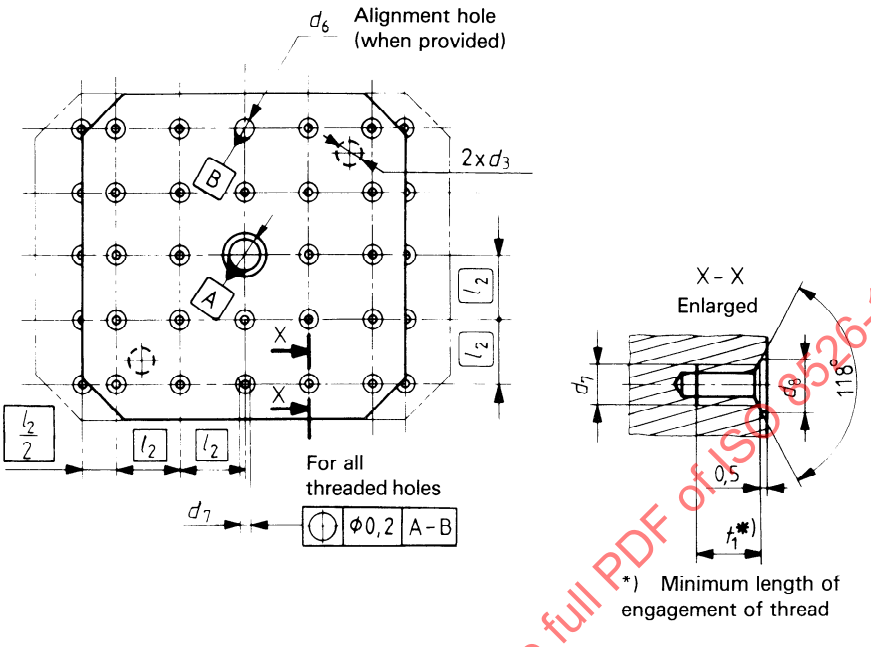
ISO 8526-1 - 500 × 500-2-100-c-a

EXAMPLE

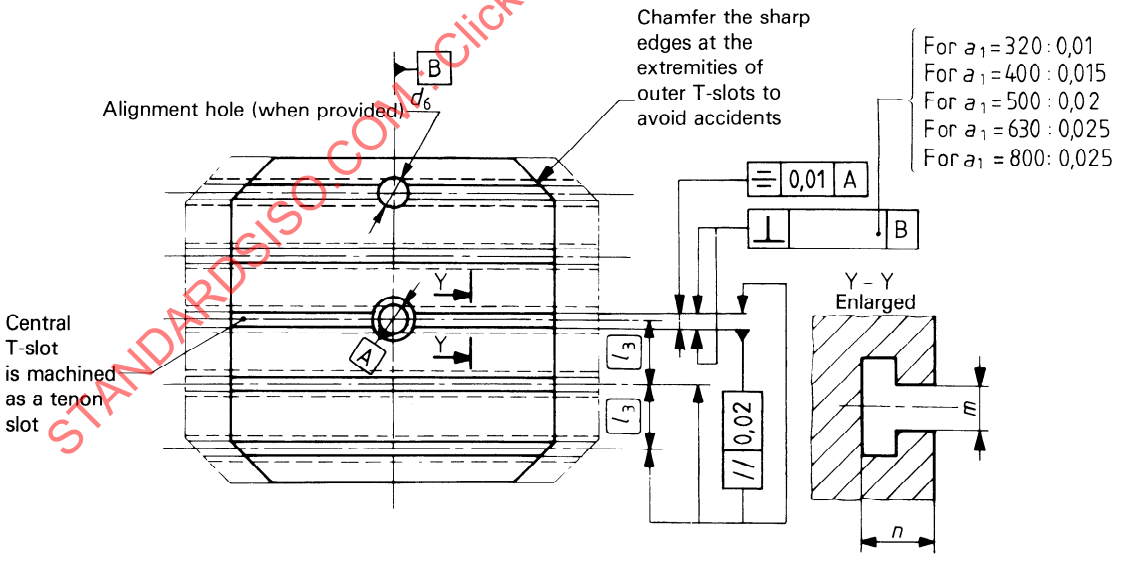
Designation of a rectangular pallet, of nominal size and length 500 × 630, with top surface type 2, with 100 mm pitch of T-slots, with workpiece location by means of centre hole and reference slot c), and pallet location on the receiver by means of tapered holes b):

ISO 8526-1 - 500 × 630-2-100-c-b

Dimensions and tolerances of location and orientation in millimetres

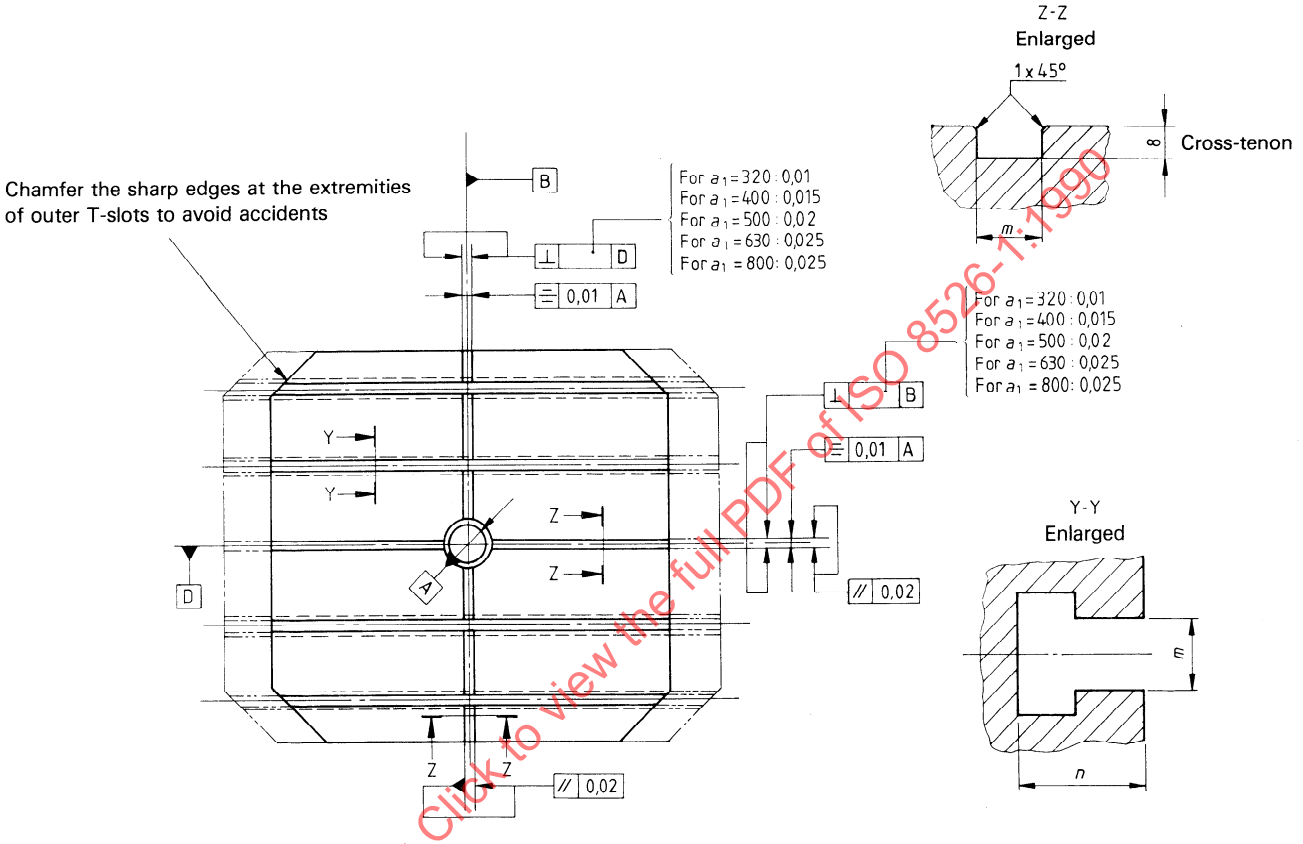


a) top surface, type 1 — with threaded fixing holes



b) top surface, type 2 — with T-slots

Dimensions and tolerances of location and orientation in millimetres

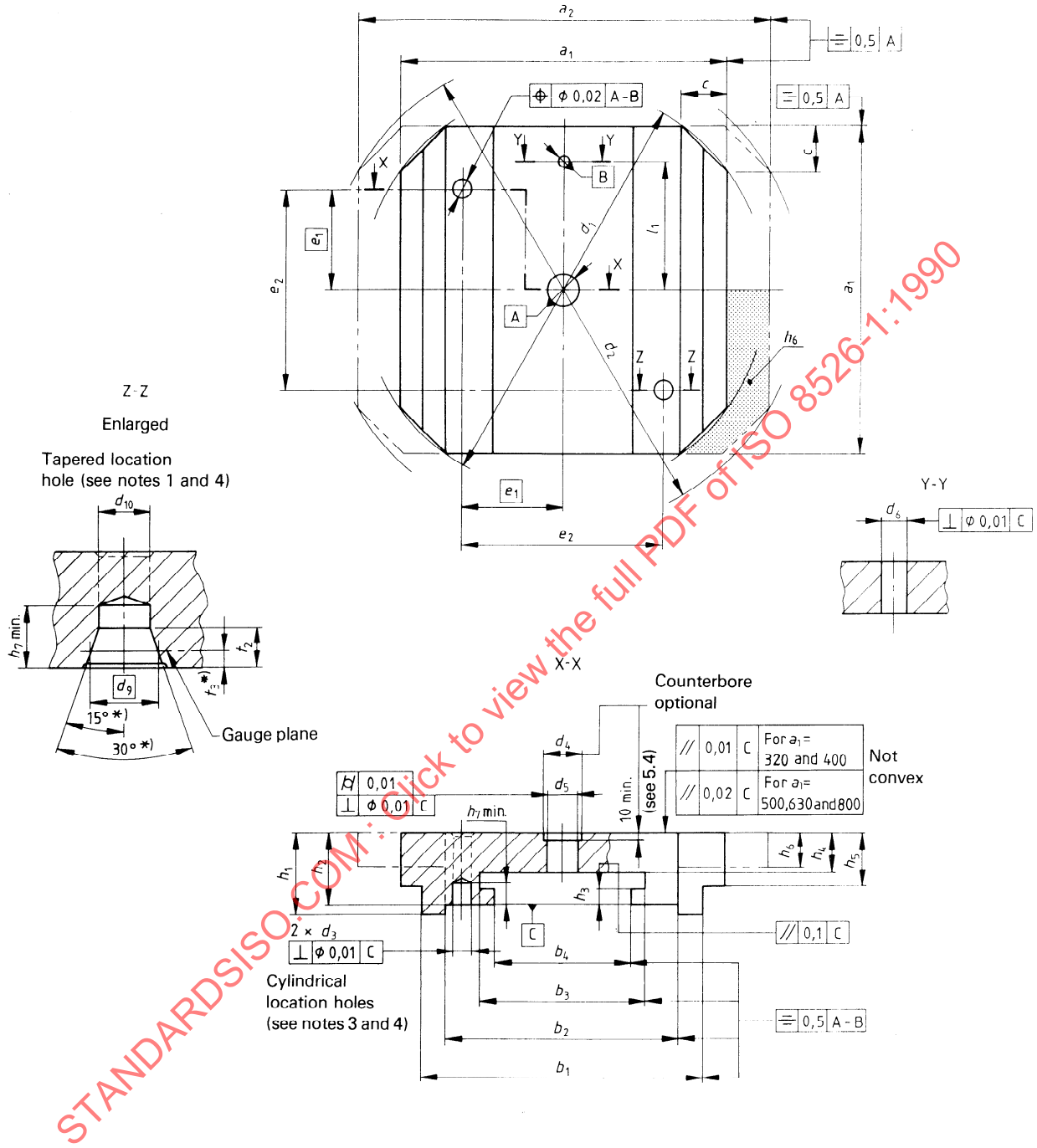


c) top surface, type 3 — with T-slots and cross-tenons

NOTE — For the tolerancing of location and orientation, see ISO 1101.

Figure 2 — Types of top surface

Dimensions and tolerances of form, orientation and location in millimetres



*) The tolerances on t_3, 15° and 30° are as specified by the manufacturer.

NOTES

1 The positions of the two tapered holes are the same as those specified for the two cylindrical location holes.

The type of location required should be stated when ordering pallets.

2 For the tolerancing of form, orientation and location, see ISO 1101.

3 Bushes of minimum depth equal to 1 1/4 times their diameter may be inserted at either end of d_3, if preferred.

4 Where d_3 or d_{10} is straight through, the centre portion of the bore of d_3 or d_{10} may be relieved to a maximum length of $h_2 - 2{,}5 \times d_3$ or $h_2 - 2{,}5 \times d_{10}$ respectively, if desired.

Figure 3 — Principal dimensions of workholding pallets

Table 2 — Dimensions of workholding pallets [1] (see figures 2 and 3)

Dimensions in millimetres

Dimension		Nominal size and length									
		$a_1 \times a_1$ 320 × 320	$a_1 \times a_2$ 320 × 400	$a_1 \times a_1$ 400 × 400	$a_1 \times a_2$ 400 × 500	$a_1 \times a_1$ 500 × 500	$a_1 \times a_2$ 500 × 630	$a_1 \times a_1$ 630 × 630	$a_1 \times a_2$ 630 × 800	$a_1 \times a_1$ 800 × 800	$a_1 \times a_2$ 800 × 1 000
b_1 $^{0}_{-0,5}$		290		340		430		540		670	
b_2 $^{+0,5}_{0}$		272		300		380		480		600	
b_3		200 $^{+1}_{0}$		200 $^{+1}_{0}$		260 $^{+1,6}_{0}$		340 $^{+1,6}_{0}$		420 $^{+1,6}_{0}$	
b_4 $^{+0,5}_{0}$		160		160		220		300		380	
c [2]		40		50		60		70		100	
d_1 $^{0}_{-5}$		400		500		630		800		1 000	
d_2 $^{0}_{5}$		—	466,5	—	583	—	736	—	938	—	1 166
d_3 $^{+0,013}_{0}$		25		25		25		30		35	
d_4 (optional)		55		55		55		55		55	
d_5 H6 [3], [4]		50		50		50		50		50	
d_6 H7 [3], [5]		20		20		20		25		25	
d_7 [6]		M10		M12		M12		M16		M16	
d_8 [6]		11		13,5		13,5		17,5		17,5	
d_9		29		29		29		40		40	
d_{10} [7]		25		25		25		30		35	
e_1		120		125		160		200		250	
e_2 ± 0,01		240		250		320		400		500	
h_1 ± 0,5		95		115		125		150		170	
h_2 ± 0,02		90		105		115		140		160	
h_3 $^{0}_{-0,25}$		20		25		25		30		30	
h_4 $^{0}_{-0,25}$		45		50		60		75		95	
h_5 $^{0}_{-0,25}$		65		70		80		95		115	
h_6		—	44	—	49	—	59	—	74	—	94
h_7 min.		20		25		25		30		30	
l_1 ± 0,013 [8], [9]	AP	100		150		200		200		300	
	GP	126		160		200		250		320	
l_2 [8], [9]	AP	50		50		100		100		100	
	GP	63		80		100		125		160	
l_3 [8], [9]	AP	50		50		100		100		100	
	GP	63		80		100		125		160	

Table 2 — Dimensions of workholding pallets [1] (see figures 2 and 3) (*concluded*)

Dimensions in millimetres

Dimension	Nominal size and length									
	$a_1 \times a_1$ 320 × 320	$a_1 \times a_2$ 320 × 400	$a_1 \times a_1$ 400 × 400	$a_1 \times a_2$ 400 × 500	$a_1 \times a_1$ 500 × 500	$a_1 \times a_2$ 500 × 630	$a_1 \times a_1$ 630 × 630	$a_1 \times a_2$ 630 × 800	$a_1 \times a_1$ 800 × 800	$a_1 \times a_2$ 800 × 1 000
m [10]	12		14		14		18		18	
$n\ ^{+1}_{0}$	20		23		23		30		30	
$t_1\ ^{+1}_{0}$	20		22		22		30		30	
t_2	8		10		10		12		12	
t_3	0,54		2,54		2,54		2,67		2,67	

1) For working limits on untoleranced dimensions, see the medium series of ISO 2768-1.

2) Chamfer × 45° or radius at choice of the manufacturer.

3) See ISO 286-2.

4) The centre hole may have a bush in the reference bore.

5) Depth at manufacturer's discretion.

6) The recess dimensions, $d_8 \times 0{,}5$, associated with the tapped holes in the top surface are primarily for thread protection. Headed plugs may be inserted in exposed holes to prevent the ingress of swarf, in which case the recess dimensions may be modified to accommodate the heads of the plugs. The use of plain plugs does not necessitate a change in these dimensions.

The dimensions of plugs have not been standardized. Therefore such dimensions are left to agreement between purchaser and manufacturer.

7) If d_{10} is used as a location hole [see clause 6 e)], it shall have a tolerance of $^{+0{,}013}_{0}$.

8) For rectangular pallets, the pitch of the outer threaded holes (on the longer dimension of the pallet) shall be half of the nominal pitch in order to avoid the threaded hole being too near the edge of the pallet.

9) AP and GP dimensions are alternative values, where AP is the arithmetic progression and GP is the geometric progression. (See annex B.)

10) The tolerance on m is H8 for tenon slots and H12 for fixing slots.

Dimensions in millimetres

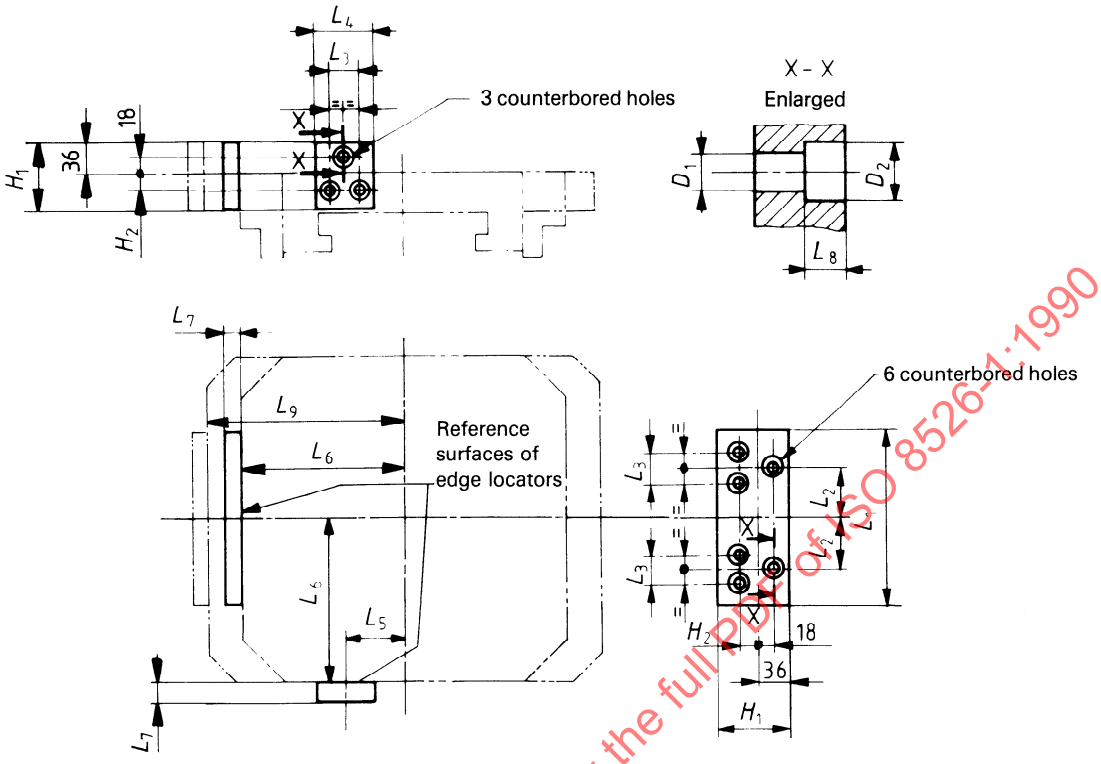


Figure 4 — Details of edge locators (when fitted)

Table 3 — Dimensions of edge locators (when fitted)

Dimensions in millimetres

Nominal size of pallet a_1	L_1	L_2	L_3	L_4	L_5	L_6 ±0,01	L_7	L_8	L_9 ±0,01	H_1	H_2	D_1	D_2	Fixing screw in pallet
320	160	50	25	50	63	160	15	10,5	200	80	22	11	17,5	M10
400	200	55	40	80	80	200	20	13	250	80	22	14	20	M12
500	250	75	40	80	125	250	25	13	315	80	22	14	20	M12
630	315	100	40	80	160	315	30	17	400	90	27	18	26	M16
800	400	135	40	80	200	400	30	17	500	90	27	18	26	M16

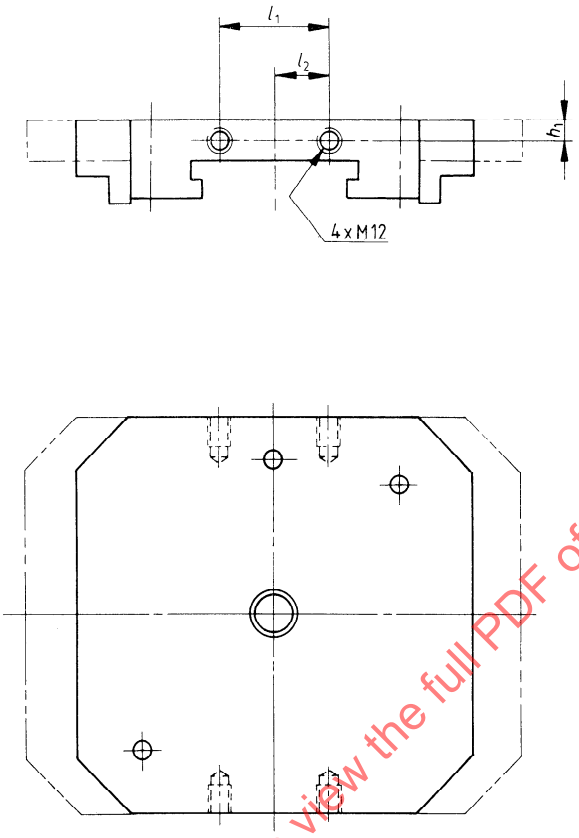


Figure 5 — Fixing holes for latch mechanism
(the pallet illustrated is of type 4 with plain top surface)

Table 4 — Dimensions of fixing holes for latch mechanism

Dimensions in millimetres

Nominal size of pallet a_1	h_1	l_1	l_2
320	22	50	25
400			
500			
630			
800			

Annex A
(normative)

Top surfaces with radial T-slots — Types 5 and 6

(See 5.2, note 2)

A.1 Top surface, type 5 — with radial T-slots

Dimensions in millimetres

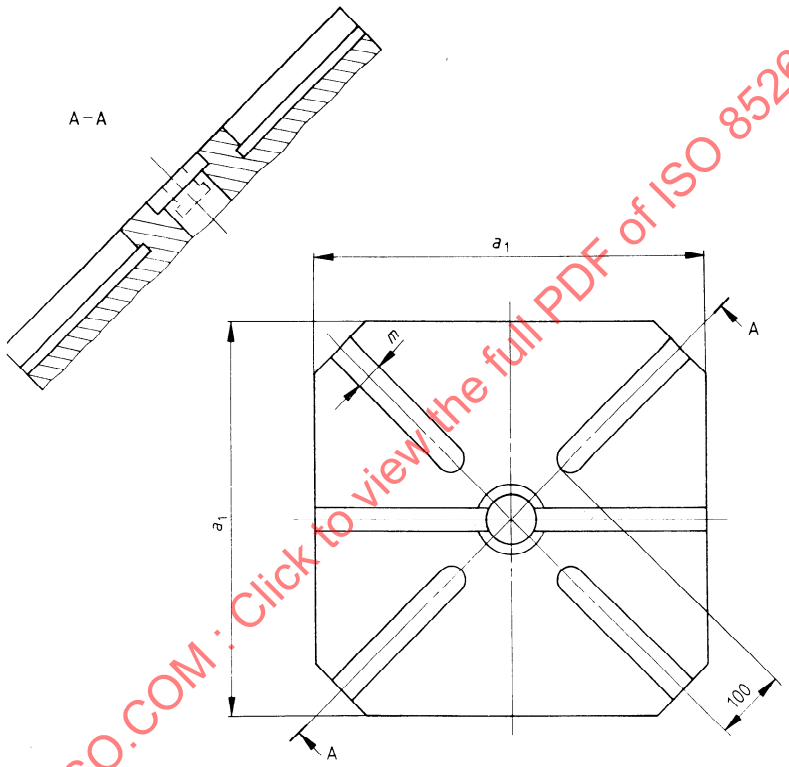


Figure A.1 — Top surface, type 5 — with radial T-slots

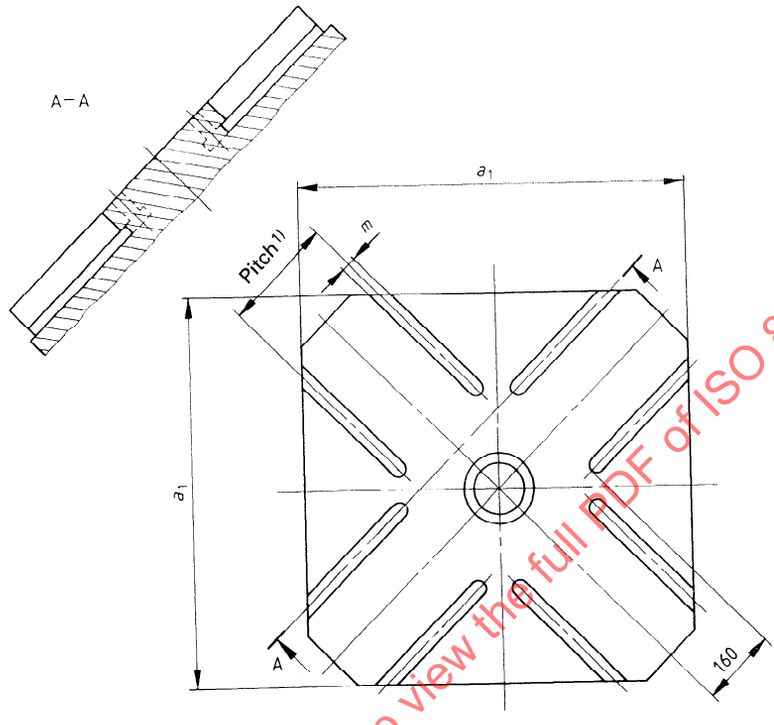
Table A.1 — Dimensions for type 5

Dimensions in millimetres

Nominal size and length of pallet $a_1 \times a_1$	Radial T-slot m
320 × 320	14
400 × 400	14
500 × 500	18

A.2 Top surface, type 6 — with twin radial T-slots

Dimensions in millimetres



1) The pitch shall be selected from ISO 299.

Figure A.2 — Top surface, type 6 — with twin radial T-slots

Table A.2 — Dimensions for type 6

Dimensions in millimetres

Nominal size and length of pallet $a_1 \times a_1$	Twin radial T-slot m
630 × 630 800 × 800	22