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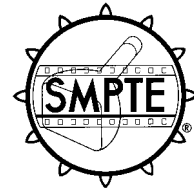
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SMPTE STANDARD

for Television Digital Recording —
19-mm Tape Cassettes

Page 1 of 26 pages

1 Scope

This standard specifies dimensions for three sizes of cassettes (S, M, and L) for use with 19-mm television digital recorders.

2 Measurements

2.1 Dimensions are in the metric system.

2.2 Tests and measurements on cassette parameters shall be made under the following atmospheric conditions:

- Temperature $20^{\circ}\text{C} \pm 1^{\circ}\text{C}$
- Relative humidity $(50 \pm 2)\%$
- Stabilization time 24 hours

2.3 Dimensions shall be as specified in the figures and tables.

2.4 General tolerances for dimensions, except those for which tolerances are otherwise specified, shall be as follows:

Over	To	mm
0	4	± 0.2
4	16	± 0.3
16	63	± 0.4
63	250	± 0.5
250		± 0.7

2.5 The tolerances employed by cassette manufacturers must also conform to the requirements specified in figure 23.

3 General specifications

3.1 The three sizes of cassettes shall be defined as:

- S: Small
- M: Medium
- L: Large

3.2 Maximum recording time in minutes for a fully loaded cassette shall be as specified in table 1.

Table 1 – Maximum recording time

Cassette size	Tape thickness			
	16 μm D-1	13 μm D-1	11 μm D-2	11 μm D-6
S	11 min	13 min	31 min	8 min
M	34 min	41 min	93 min	28 min
L	76 min	94 min	207 min	64 min

3.3 The magnetic coating on the tape shall face out of the cassette as specified in figures 1 to 3.

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3.4 Transmissivity of the cassette perpendicular to datum plane Z shall be less than 5%, measured over the range of wavelengths 700 nm to 900 nm.

4 Datum planes

4.1 Datum plane Z is determined by datum areas A, B, and C as specified in figures 4 to 6.

4.1.1 Datum C need not correspond to a fastener.

4.2 Datum plane X shall be orthogonal to datum plane Z and shall run through the center of datum hole (a) and datum hole (b) as specified in figures 7 to 9.

4.3 Datum plane Y shall be orthogonal to both datum plane X and datum plane Z and shall run through the center of datum hole (a) as specified in figures 7 to 9.

5 Window and labels

5.1 Window and label areas shall be as specified in figures 10 to 12.

5.2 Labels attached to the cassette shall not extend beyond the external dimensions as shown in figures 10 to 12.

5.2.1 Labels shall not interfere with users' or manufacturer's identification holes.

5.2.2 Labels shall not interfere with the hub drive and support mechanism.

6 Identification holes

6.1 There shall be two sets of identification holes: user holes and manufacturer coding holes.

6.1.1 Figures 13 to 15 detail the location of user and manufacturer coding holes. Manufacturer holes shall be used in combinations according to the tape thickness, coercivity, and/or application according to table 2.

6.1.2 A "0" in table 2 indicates that the recorder/player sensor mechanism has detected that the indicator tab has been removed and the hole is open.

Table 2 – Manufacturer coding holes

Code designation	Hole number				Description	Format application
	1	2	3	4		
A	0	0	0	0	16 μ m tape, class 850	D-1
B	1	0	0	0	Undefined	
C	0	1	0	0	13 μ m tape, class 850	D-1
D	1	1	0	0	Undefined	
E	0	0	1	0	Cleaning tape	NA
F	1	0	1	0	11 μ m tape, class 1700	(D-6)
G	0	1	1	0	Undefined	
H	1	1	1	0	Undefined	
I	0	0	0	1	Undefined	
J	1	0	0	1	Undefined	
K	0	1	0	1	13 μ m tape, class 1500	D-2
L	1	1	0	1	Undefined	
M	0	0	1	1	Undefined	
N	1	0	1	1	11 μ m tape – Reserved	Reserved
O	0	1	1	1	Undefined	
P	1	1	1	1	11 μ m tape – Reserved	Reserved

6.2 The dimensions and location of the user holes are specified in figures 13 to 15. Their use shall be defined as follows:

6.2.1 When a "0" state exists, the user holes shall identify the following conditions:

Hole number 1: Total record lock out
(audio/video/cue/time
code/control track)

Hole number 2: Reserved and undefined

Hole number 3: Video and control track record
lock out

Hole number 4: Reserved and undefined

6.2.2 The user plug mechanism shall withstand an axial force of 0.5 N.

7 Leader/trailer tape

7.1 The cassette shall include leader and trailer tape. When attached to the hub, there shall be a length of $300 \text{ mm} \pm 30 \text{ mm}$ between the splice point and the outside of the shell.

7.2 The leader/trailer tape material shall be polyester or equivalent having a transmissivity of at least 60% when measured with a 700 nm to 900 nm light source.

7.3 When attached to the hub, the leader/trailer tape shall not separate when subjected to a force of 22 N or less.

7.4 The width of the leader/trailer tape shall be $19.000 \text{ mm} \pm 0.025 \text{ mm}$.

7.5 The thickness of the leader/trailer tape shall be $20 \text{ } \mu\text{m} \pm 10 \text{ } \mu\text{m}$.

7.6 The splicing tape used to attach the leader tape shall be applied to the nonmagnetic coated side.

8 Reels

8.1 The dimensions of the reels and the relationship between the reels and reel tables are specified in figures 16 and 17.

8.2 The reels shall be locked automatically when the cassette is removed from the recorder/player.

8.3 When an S cassette is inserted into a recorder/player, the reels shall be unlocked automatically as specified in figure 18.

8.3.1 The force needed to release the reel lock of the S cassette shall be 0.6 N max.

8.4 When an M or L cassette is inserted into a recorder/player, the reel shall be unlocked automatically by opening the lid as specified in figures 19 and 20.

8.5 The reel shall be held in position by a reel spring with a force as shown in table 3, when the height of the reel table support is $2.0 \text{ mm} \pm 0.2 \text{ mm}$ from datum plane Z.

9 Lid

9.1 The lid shall be unlocked and opened by the recorder/player when the cassette is inserted.

9.1.1 The lid shall be unlocked by a 0.6 N max force being exerted upon the release pin, as specified in figures 21 and 23.

9.1.2 The inner door shall be lifted by the recorder/player to the position shown in figure 22.

9.2 The outer door when open shall not exceed 51 mm with respect to datum plane Z, as specified in figure 22.

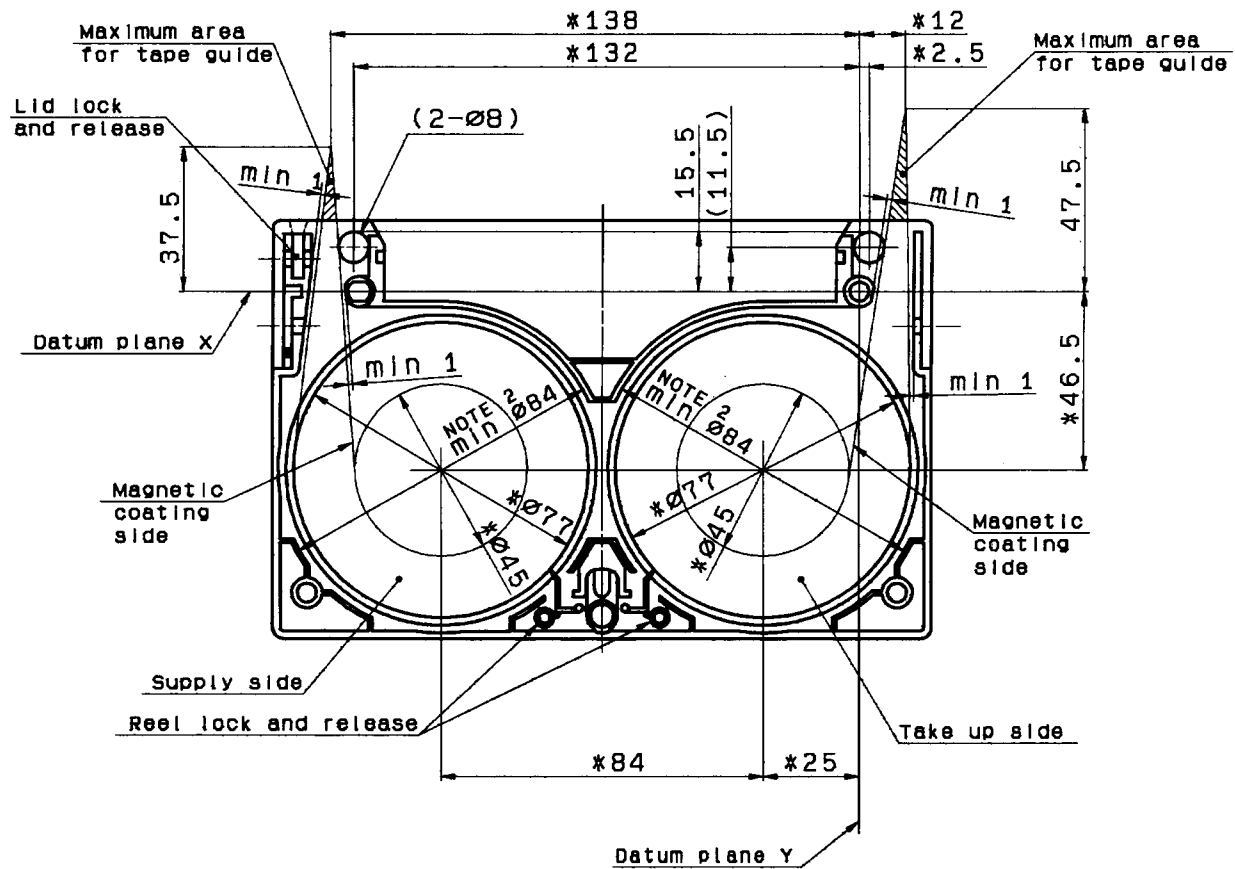
9.3 When the cassette is removed from the recorder/player, the lid shall lock automatically.

9.4 The maximum force to open the lid shall be 1.5 N at the minimum height defined in figure 22.

9.5 The force required to open the lid shall be applied $90^\circ \pm 5^\circ$ to datum plane Z.

10 Space for tape loading mechanism

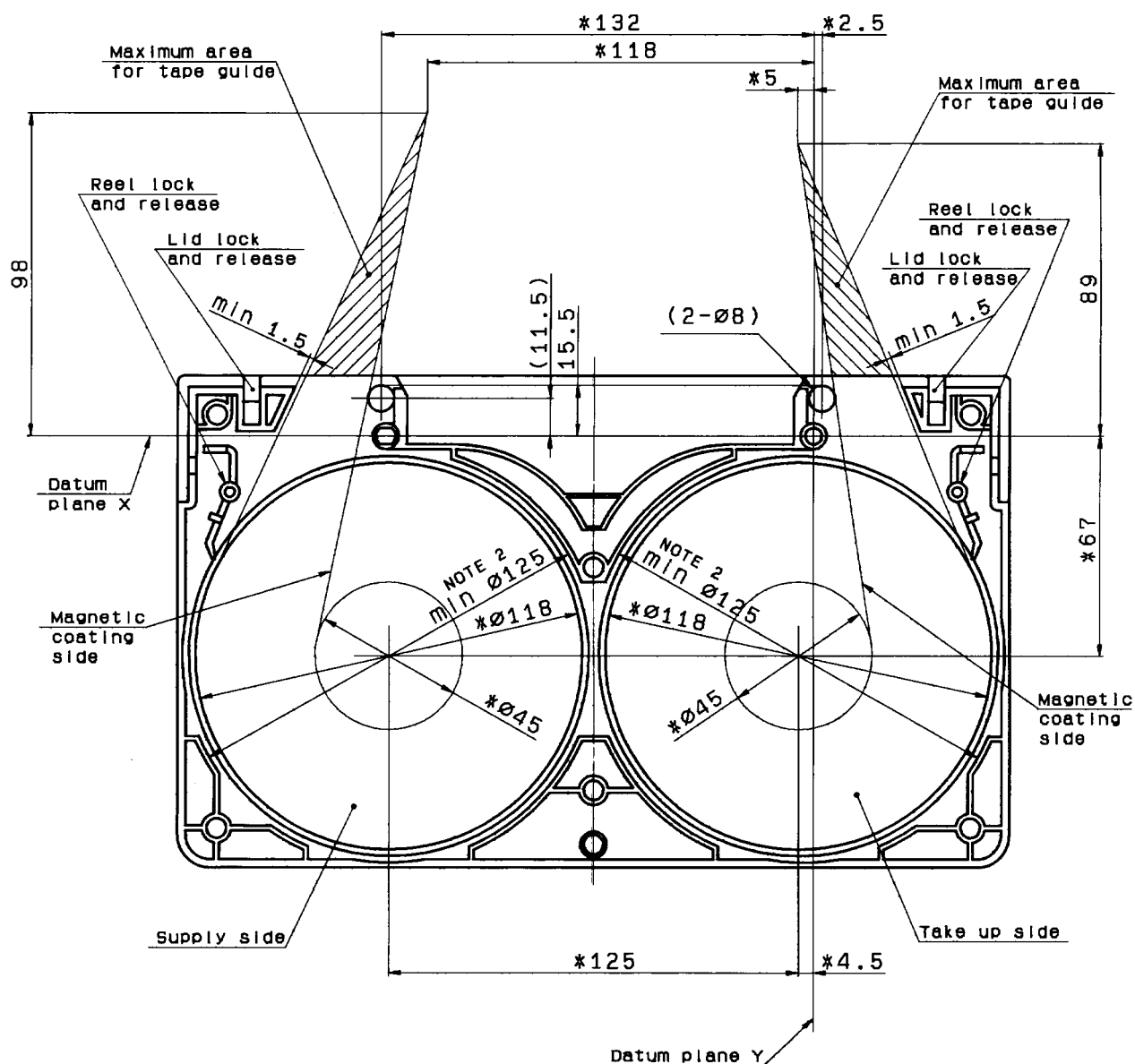
The shaded area of figure 23, intended for manufacturers of DTTRs, is the area available for loading (threading) of tape. It should be noted that the dimensions defining this space are not cassette dimensions, but are shown to be an interference-free space. Cassette dimensions are shown in figures 7, 8, and 9.



NOTES

- 1 Dimensions marked with an asterisk are nominal values specifying the tape path.
- 2 Area for the reel.

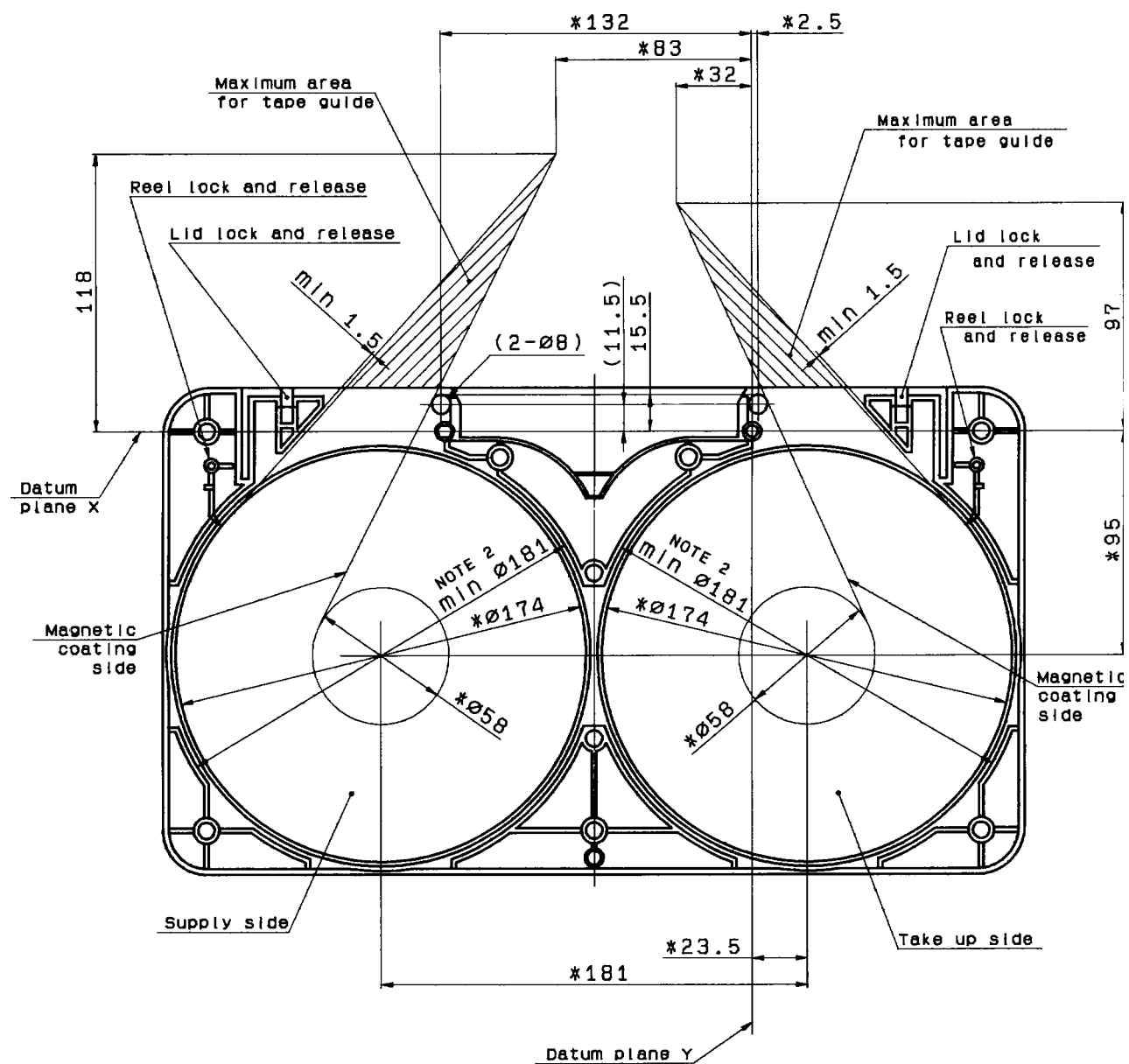
**Figure 1 – Internal structure and tape path of S cassette – Top view
(for reference only)**



NOTES

- 1 Dimensions marked with an asterisk are nominal values specifying the tape path.
- 2 Area for the reel.

**Figure 2 – Internal structure and tape path of M cassette – Top view
(for reference only)**



NOTES

- 1 Dimensions marked with an asterisk are nominal values specifying the tape path.
2 Area for the reel.

**Figure 3 – Internal structure and tape path of L cassette – Top view
(for reference only)**

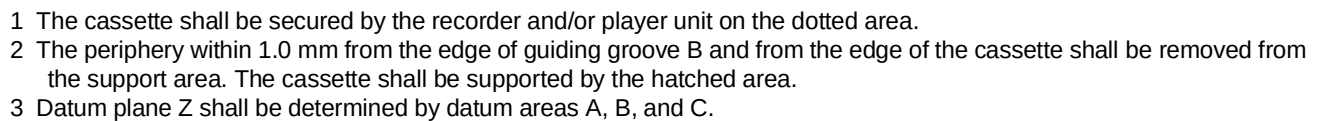
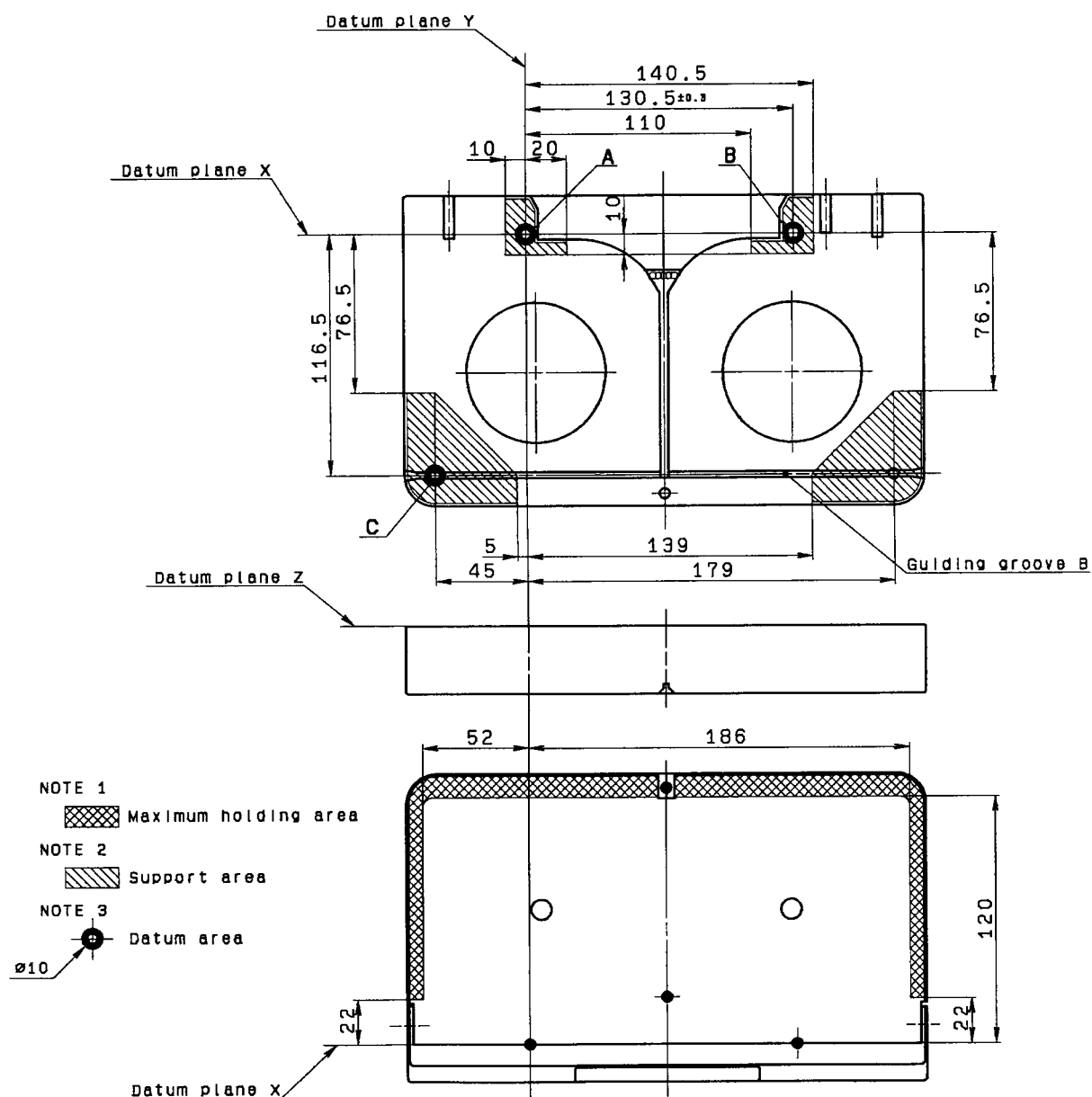


Figure 4 – Datum area, support area and holding area of S cassette



NOTES

- 1 The cassette shall be secured by the recorder and/or player unit on the dotted line.
- 2 The periphery within 1.0 mm from the edge of guiding groove B and from the edge of the cassette shall be removed from the support area. The cassette shall be supported by the recorder and/or player unit on the hatched area.
- 3 Datum plane Z shall be determined by datum areas A, B, and C.

Figure 5 – Datum area, support area and holding area of M cassette