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ISO 15750-3

Second edition
2022-05

Packaging — Steel drums —

Part 3: Inserted flange-type closure systems

Emballages — Fûts en acier —

Partie 3: Systèmes de fermeture à collerette (filetée) sertie

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html

This document was prepared by Technical Committee ISO/TC 122, *Packaging*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 261, *Packaging*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15750-3:2002), which has been technically revised.

The main changes are as follows:

— in 4.3, finish of the flanges, steel plugs, label rings and protection rings can now be chosen between the purchaser and the supplier;

— in Annex C, the configuration and dimensions of zinc-alloy die cast plugs were deleted due to obsolescence;

— in C.1, Figure C.1, the zinc-alloy plug is obsolete and has been replaced with the steel plug;

— in C.7, materials of washers for flanges and plugs can now be agreed between the purchaser and the supplier.

A list of all parts in the ISO 15750 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Packaging — Steel drums —

Part 3: Inserted flange-type closure systems

1 Scope

This document specifies the characteristics, dimensions and finish of the inserted flange-type closure systems used for steel drums.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges*

ISO 3573, *Hot-rolled carbon steel sheet of commercial and drawing qualities*

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 5002, *Hot-rolled and cold-reduced electrolytic zinc-coated carbon steel sheet of commercial and drawing qualities*

ISO 11949, *Cold-reduced tinmill products — Electrolytic tinplate*

ISO 11950, *Cold-reduced tinmill products — Electrolytic chromium/chromium oxide-coated steel*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
inserted flange-type closure
mechanical fixed steel insert with threads, closable with plugs made of steel, other metals or synthetic materials such as plastics, ensuring a leaktight closing in drums

3.2
elastomer
macromolecular material which returns rapidly to its initial dimensions and shape after substantial deformation by a weak stress and release of the stress

[SOURCE: ISO 472:2013, 2.327, modified — Note 1 to entry has been deleted.]

3.3
thermoplastics
plastics that are capable of being repeatedly softened by heating and hardened by cooling through a temperature range characteristic of the plastics and, in the softened state, of being repeatedly shaped by flow into articles by moulding, extrusion or forming

4 Dimensions, materials and finish

4.1 The nominal pitch diameter and the pitch of the thread of the closures G 2 and G 3/4 shall conform to ISO 228-1.

These closures shall fit GO gauges conforming to ISO 228-2.

4.2 The dimensions and materials of the closure systems shall be in accordance with the relevant annexes for the closure type, i.e.:

— Annex A: octagonal base closure system (type A closure);

— Annex B: serrated base closure system (type B closure);

— Annex C: octagonal (G 2)/hexagonal (G 3/4) base closure system (type C closure).

4.3 The finish of the flanges, steel plugs, label rings and protection rings shall be chosen and agreed between the purchaser and the supplier.

If for reasons of compatibility another finish of the closure system is required, the nature of the internal and external finish should be agreed upon between the purchaser and the supplier.

5 Design and construction

5.1 Flanges

The flanges shall be the mechanical inserted type and shall make a leaktight fit when inserted.

5.2 Plugs

The plugs shall be designed so that they can be inserted or removed by means of a simple tool.

The plugs shall have a wrenching insert projection welded to the bottom of the sump of the plug or have a wrenching device formed as part of the plug.

The dimensions of the wrenching insert shall be such that the plugs can be operated by a universal tool for steel and plastics plugs. Examples are shown in Annex D.

For recommended closing torques, see Annex E.

5.3 Capseals and overseals

Capseals or overseals, when fitted, shall be the manual or pneumatic crimping type and shall have provisions for customs sealing and evidence of tampering.

Capseals/overseals shall be so designed that they can be removed by means of a simple tool.

5.4 Label rings and protection rings

Label rings and/or protection rings shall be designed so that, when fitted, they can be mechanically inserted simultaneously with the flanges. Label rings shall have provisions for customs sealing.

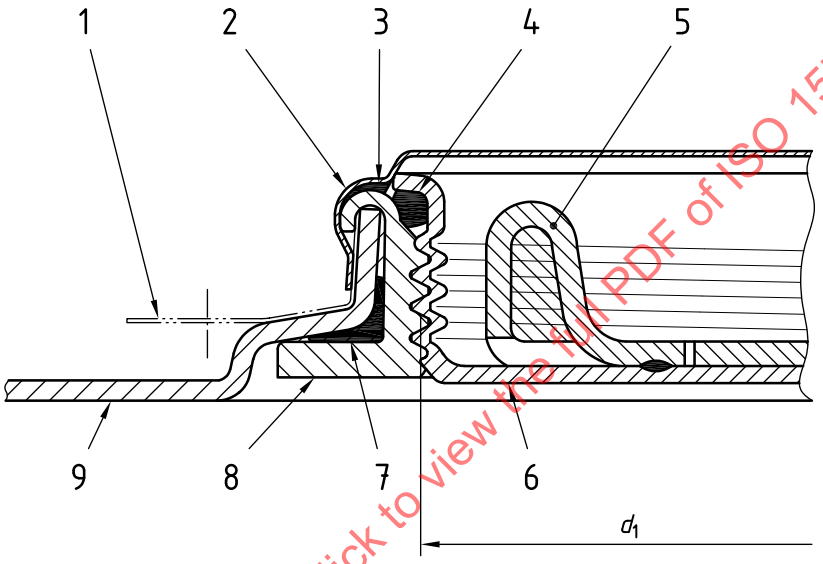
NOTE Label rings and/or protection rings can provide adequate reinforcement for the flange insertion and can protect the drum stock neck against corrosion.

Annex A
(normative)

Octagonal base closure system (type A closure)

A.1 Nomenclature for closure system

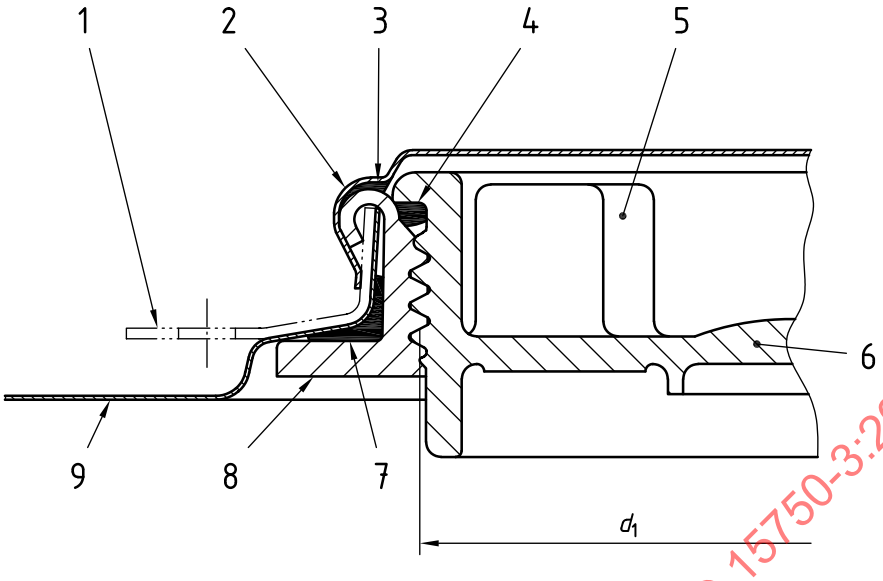
Closure components of the closure system may deviate from those shown in Figures A.1 and A.2. However, the specified dimensions shall be followed.



Key

1	optional label ring/protection ring	6	example with steel plug
2	capseal	7	elastomer flange washer
3	gasket	8	flange
4	plug washer	9	drum stock
5	wrenching insert	d_1	Nominal pitch diameter.

Figure A.1 — Assembly in medium- and heavy-gauge stock



Key

1	label ring/protection ring	6	example with plastic plug
2	capseal	7	elastomer flange washer
3	gasket	8	flange
4	plug washer	9	drum stock
5	wrenching insert	d_1	Nominal pitch diameter.

Figure A.2 — Assembly in light-gauge drum stock

A.2 Flanges and elastomer flange washer

A.2.1 Dimensions

Specific dimensions for flanges and elastomer flange washers shall be as shown in Figures A.3 and A.4 and specified in Table A.1.

Flanges and elastomer washers may deviate from those shown in the figures.

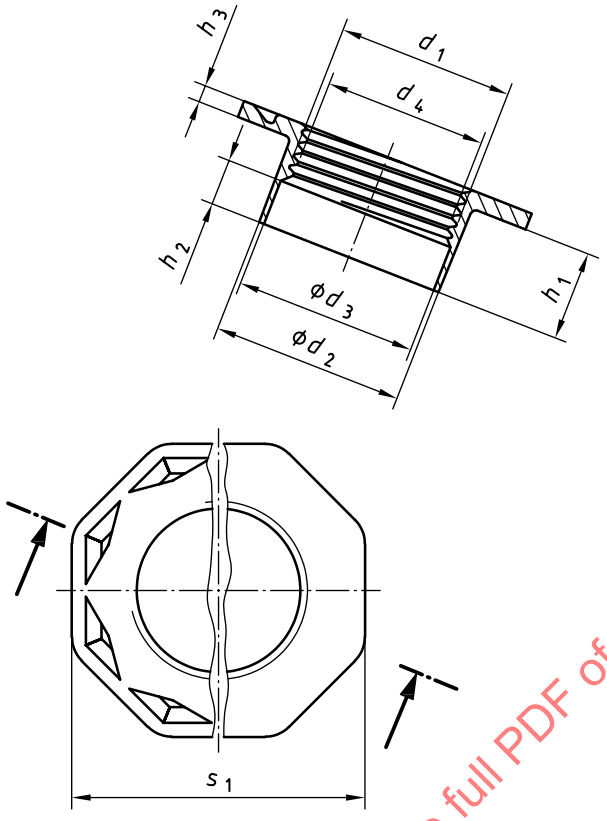


Figure A.3 — Flange

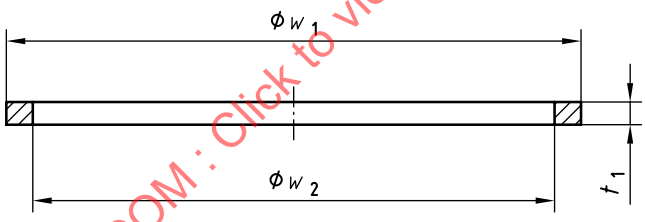


Figure A.4 — Elastomer flange washer

Table A.1 — Flanges and elastomer flange washers

Dimensions in millimetres

Thread	Nominal pitch diameter	Flange dimensions							Elastomer flange washer dimensions
	d_1	d_2 ±0,3	d_3 ±0,3	d_4 ±0,3	h_1 ±0,5	h_2 ±0,5	h_3 ±0,4	s_1 ±0,3	$w_1 \times w_2 \times t_1$ ±1,0 × ± 1,0 × ± 0,5
G 3/4	[a]	29,0	27,2	24,5	12,9	7,2	2,7	43,7	32 × 27,2 × 2,6
G 2	[a]	62,4	60,4	57,1	15,8	7,9	2,8	77,9	67 × 60,5 × 2,6

[a] Conforming to ISO 228-1.

A.2.2 Materials and configuration

Flanges shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for its intended use.

The specific type of elastomer shall be agreed between the purchaser and the supplier.

Alternative configurations of the flange and flange washer(s) should be agreed between the purchaser and the supplier.

A.3 Label rings and protection rings

A.3.1 Dimensions

Specific dimensions for label rings and protection rings shall be as shown in Figures A.5 and A.6 and specified in Table A.2.

Label rings and protection rings may deviate from those shown in the figures.

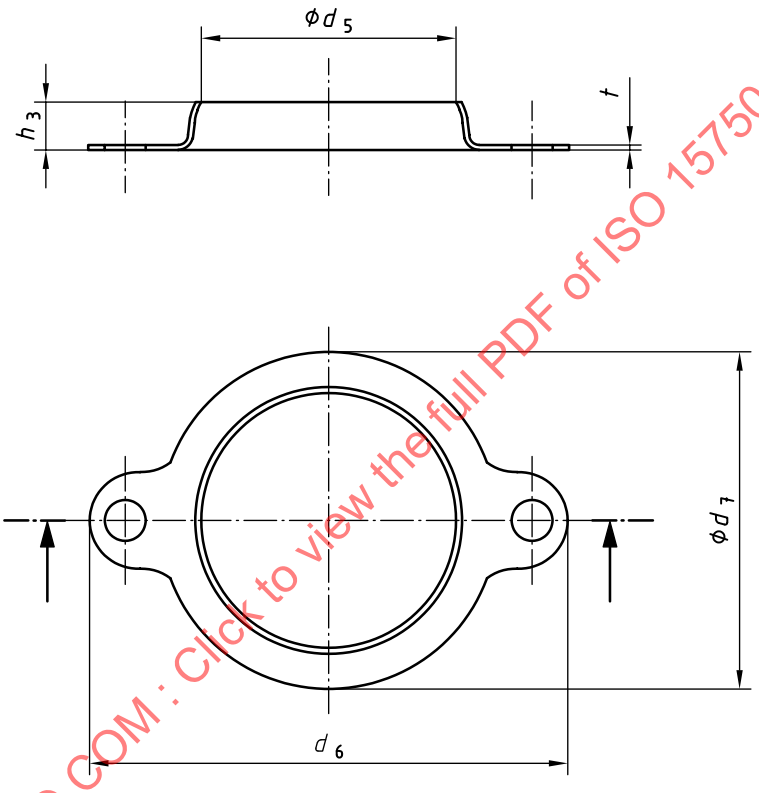


Figure A.5 — Label ring

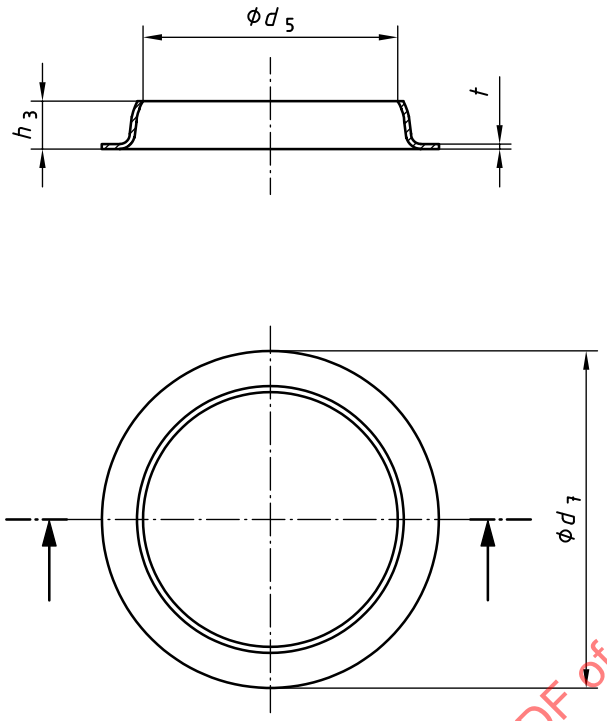


Figure A.6 — Protection ring

Table A.2 — Label rings and protection rings

Dimensions in millimetres

Thickness of end stock x	Thread	Dimensions d_5 ±0,4	 d_6 ±0,4	 d_7 ±0,4	 h_3 ±0,4	Thickness of label rings and protection rings t
Light gauge 0,5 ≤ x < 0,8	G 3/4	29,7	54,0	41,0	6,4	0,8
	G 2	62,3	98,5	74,5	8,4	
Medium gauge 0,8 ≤ x < 1,5	G 3/4	31,0	58,5	41,0	5,4	0,3[a]
	G 2	63,5	99,5	74,5	8,2	
Heavy gauge 1,5 ≤ x < 2,0	G 3/4	31,3	58,5	41,0	5,7	0,3[a]
	G 2	65,7	99,5	74,5	7,3	

[a] The use of label or protection rings is optional for medium- and heavy-gauge end stock.

A.3.2 Materials and configuration

Label and protection rings shall be made from mild steel in accordance with ISO 5002 or another material appropriate to the requirements for its intended use.

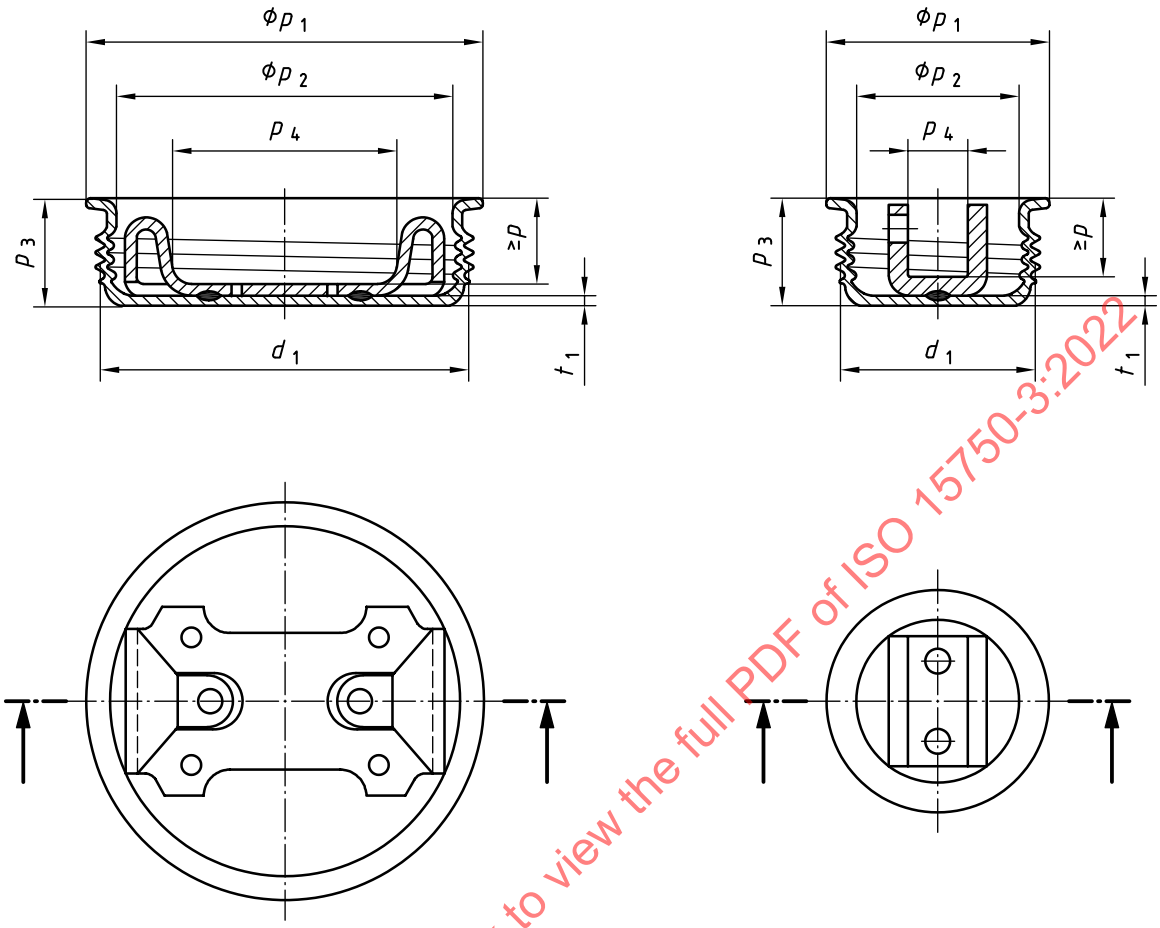
Alternative configurations of label and protection rings should be agreed between the purchaser and the supplier.

A.4 Steel plugs and elastomer or thermoplastics plug washers

A.4.1 Dimensions

Specific dimensions for steel plugs and elastomer or thermoplastics plug washers shall be as shown in Figures A.7 and A.8 and specified in Table A.3.

Steel plugs and elastomer or thermoplastics plug washers may deviate from those shown in the figures.



a) G 2 thread **b) G 3/4 thread**

Figure A.7 — Steel plug

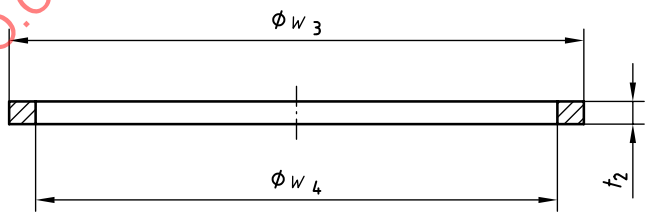


Figure A.8 — Elastomer plug washer

Table A.3 — Steel plugs and elastomer plug washers

Dimensions in millimetres

Thread	Nominal pitch diameter d_1	Plug dimensions						Elastomer plug washer dimensions $w_3 \times w_4 \times t_2$ ±1,0 × ± 1,0 × ± 0,5
		p_1 ±0,5	p_2 ±0,7	p_3 ±0,7	p_4[b] ±1,5	p[c] min.	t_1 ±0,2	
G 3/4	[a]	28,1	20,5	13,7	8,5	8,5	1,2	25,5 × 20,3 × 2,4
G 2	[a]	61,2	53,6	15,5	33,5	11,5	1,2	56,0 × 50,5 × 2,7

[a] Conforming to ISO 228-1.

[b] Dimension p_4 for G 2 is measured at a position 2 mm above the top of the flat part of the wrenching insert.

[c] Dimension p (min.) is measured from the top of the plug to the top of the flat part of the wrenching insert..

A.4.2 Materials and configuration

Plugs shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for their intended use.

The position of the wrenching inserts shall be not more than 0,5 mm out of centre.

Plug washers should be made from elastomer; however, thermoplastics materials are also acceptable. The specific type of elastomer or thermoplastics shall be agreed between the purchaser and the supplier.

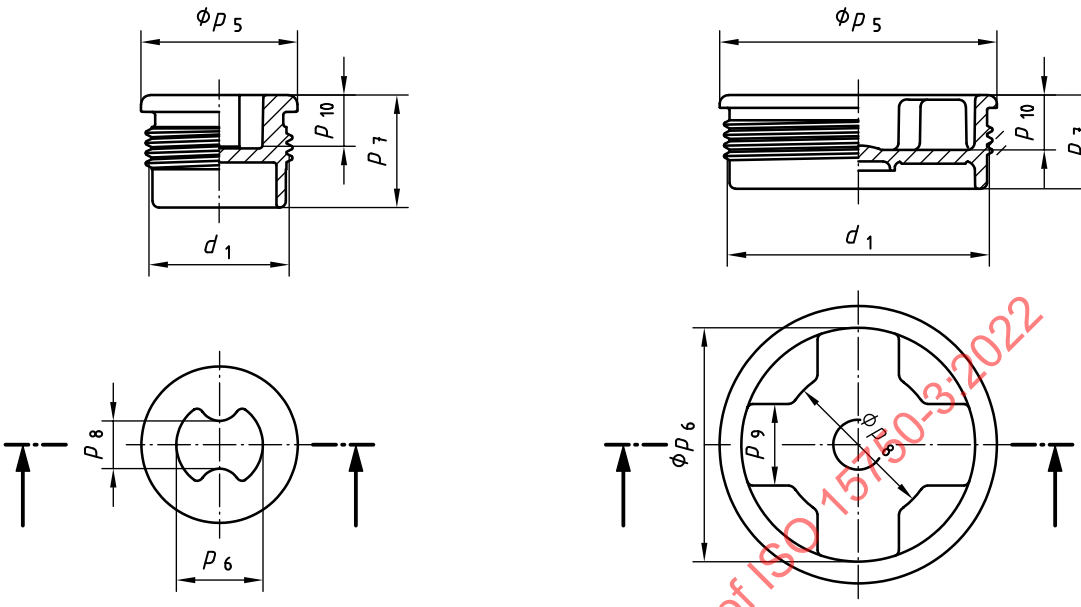
Alternative configurations of the plug and plug washer should be agreed between the purchaser and the supplier.

A.5 Plastic plugs and elastomer plug washers

A.5.1 Dimensions

Specific dimensions for plastics plug and elastomer plug washers shall be as shown in Figures A.9 and A.10 and specified in Table A.4.

Plastics plugs and elastomer plug washers may deviate from those shown in the figures.



a) G 3/4 thread b) G 2 thread

Figure A.9 — Plastics plug

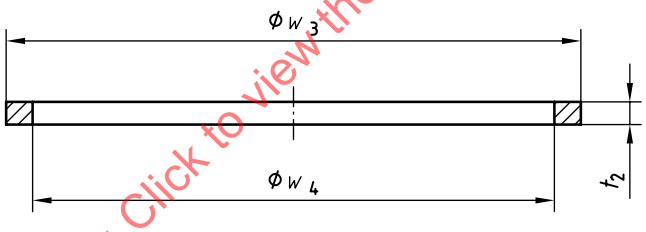


Figure A.10 — Elastomer plug washer

Table A.4 — Plastics plugs and elastomer plug washers

Dimensions in millimetres

Thread	Nominal pitch diameter d_1	Plug dimensions p_5 ±0,4	p_6 ±0,4	p_7 ±0,4	p_8 ±0,4	p_9 ±0,4	p_{10} ±0,4	Elastomer plug washer dimensions $w_3 \times w_4 \times t_2$ ±1,0 × ±1,0 × ±0,5
G 3/4	[a]	27,9	17,3	20,0	8,5	N.A.	9,5	25,5 × 20,3 × 2,4
G 2	[a]	61,1	51,5	20,5	34,0	18,0	12,0	56,0 × 50,5 × 2,7

Key

N.A. Not applicable.

[a] Conforming to ISO 228-1.

A.5.2 Materials and configuration

Plugs shall be made from a copolymer of polypropylene. Other materials may be agreed between the purchaser and the supplier.

Plug washers should be made from elastomer; however, thermoplastics materials are also acceptable. The specific type of elastomer or thermoplastics shall be agreed by the purchaser and the supplier.

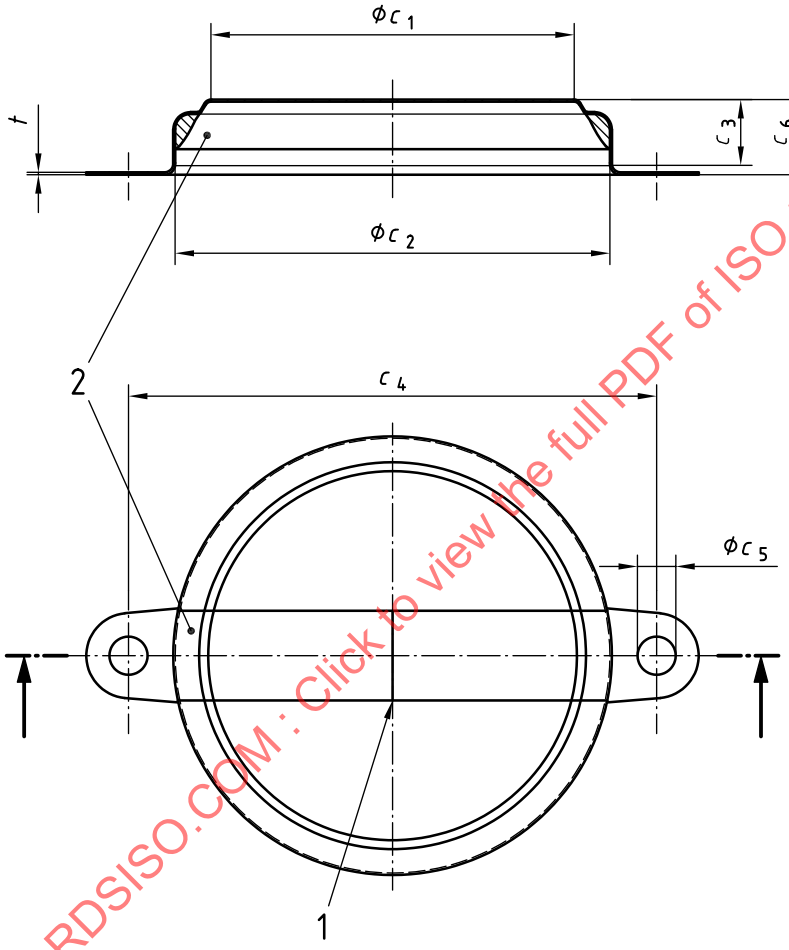
Alternative configurations of the plug and plug washer should be agreed between the purchaser and the supplier.

A.6 Capseals

A.6.1 Dimensions

Specific dimensions for capseals shall be as shown in Figure A.11 and specified in Table A.5.

Capseals may deviate from those shown in the figure.



Key

1 scored lines

2 flowed-in gasket

Figure A.11 — Capseal

Table A.5 — Capseal

Dimensions in millimetres

Thread	Capseal dimensions						Thickness of printed capseals
	c_1 ±0,4	c_2 ±0,4	c_3 ±0,4	c_4 ±0,4	c_5 ±0,2	c_6 ±0,7	t ±0,05
G 3/4	29,0	35,1	8,9	43,0	3,5	9,9	0,35
G 2	62,4	69,8	11,2	85,0	4,8	12,2	0,35
Printing of the capseal (if required) should be agreed between the purchaser and the supplier.							

A.6.2 Materials and configuration

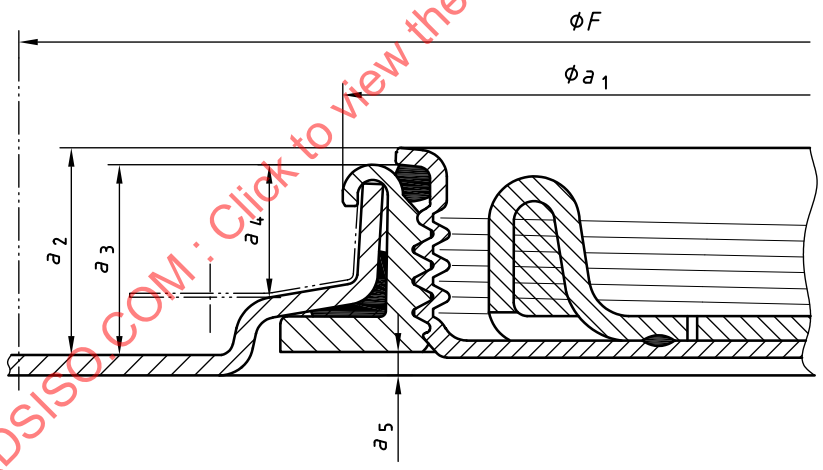
Capseals shall be made from low-carbon sheet steel in accordance with ISO 11949 or ISO 11950, or another material suitable for its intended use.

Alternative configurations should be agreed between the purchaser and the supplier.

A.7 Assembly without capseal

Specific dimensions for an assembly without capseal shall be as shown in Figure A.12 and specified in Table A.6.

An assembly without capseal may deviate from that shown in the figure.



NOTE ISO 15750-1 and ISO 15750-2 require that the closure assembly does not protrude above the drum chime.

Figure A.12 — Assembly without capseal

Table A.6 — Closure assembly without capseal

Dimensions in millimetres

Thread	Closure assembly					Minimum free space required around closure for capseal application tools
	a_1 ±0,5	a_2 ±0,5	a_3 ±0,5	a_4 ±0,5	a_5 N.A.	F
G 3/4	33,9	11,7	11,2	6,6	> 0	90
G 2	68,4	14,5	13,6	9,4	> 0	110

Key

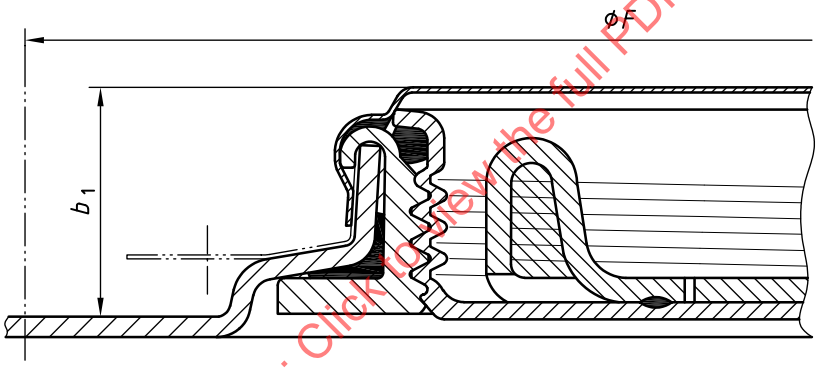
N.A. Not applicable.

The recommendations of the supplier of the closures on insertion of the flanges should be followed if they deviate from the above.

A.8 Assembly with capseal

Specific dimensions for an assembly with capseal shall be as shown in Figure A.13 and specified in Table A.7.

An assembly with capseal may deviate from that shown in the figure.



NOTE ISO 15750-1 and ISO 15750-2 require that the closure assembly does not protrude above the drum chime.

Figure A.13 — Assembly with capseal

Table A.7 — Closure assembly with capseal

Dimensions in millimetres

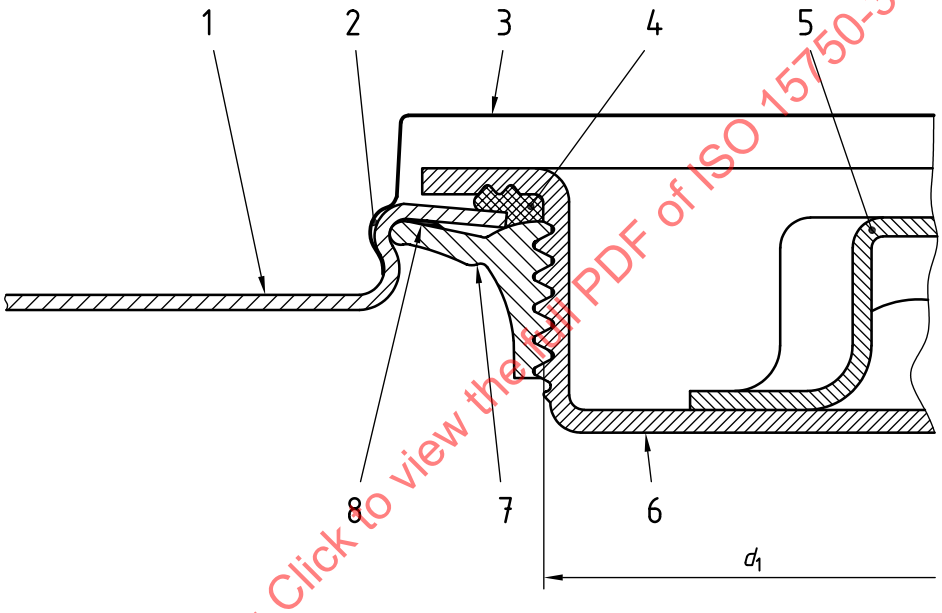
Thread	Dimension b_1 ±0,5	Minimum free space required around closure for capseal application tools F
G 3/4	14,1	90
G 2	17,3	110
The recommendations of the supplier of the closures on insertion of the flanges should be followed if they deviate from the above.		

Annex B
(normative)

Serrated base closure system (type B closure)

B.1 Nomenclature for closure system

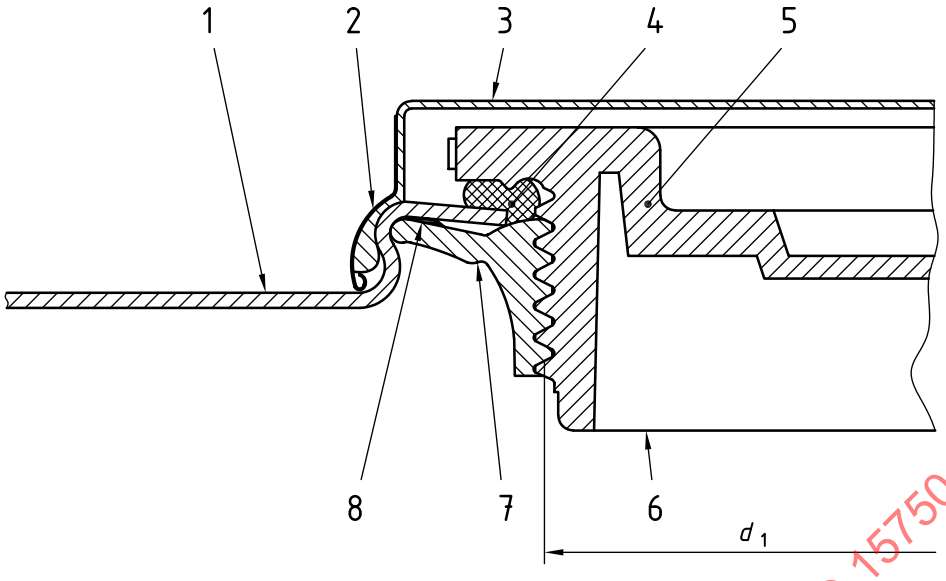
Closure components of the closure system may deviate from those shown in Figures B.1 and B.2. However, the specified dimensions shall be followed.



Key

1	drum stock	5	wrenching insert
2	compound	6	steel plug
3	overseal	7	flange
4	washer	8	compound
d_1	Nominal pitch diameter.		

Figure B.1 — Assembly cross-section showing steel G 2 plug



Key

1	drum stock	5	wrenching part
2	metallic ring	6	plastics plug
3	overseal (plastics)	7	flange
4	washer	8	compound
d_1	Nominal pitch diameter.		

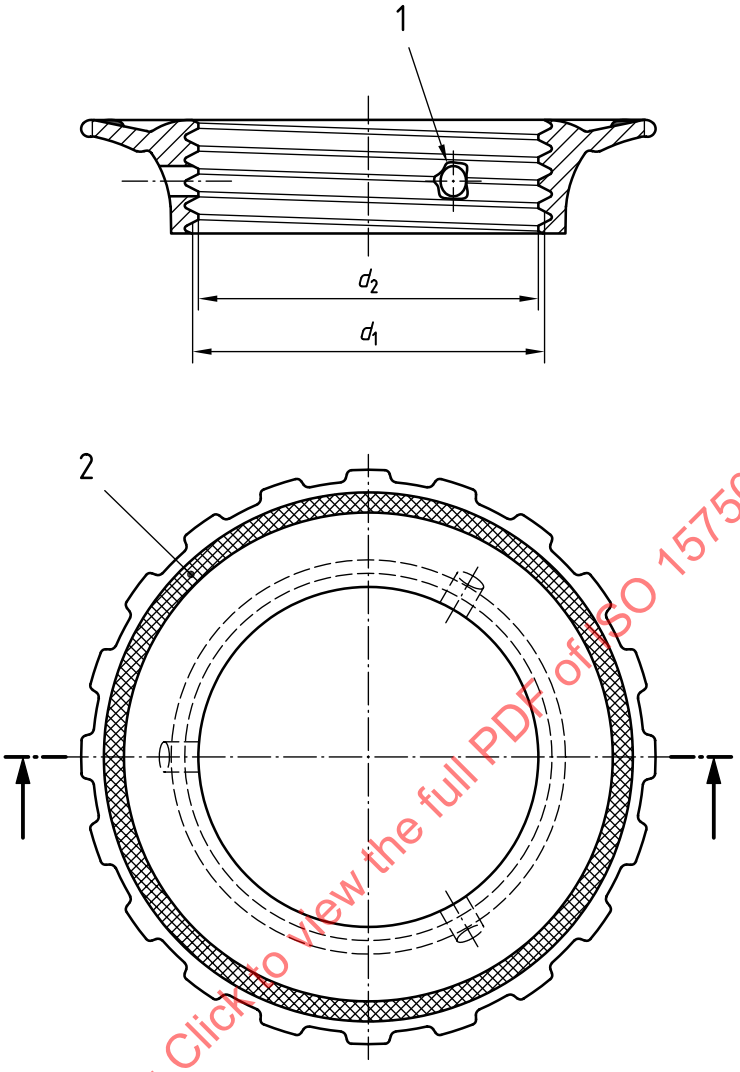
Figure B.2 — Assembly cross-section showing plastics G 2 plug

B.2 Flanges and sealing features

B.2.1 Dimensions

Specific dimensions for the flange shall be as shown in Figure B.3 and specified in Table B.1.

The flange may deviate from that shown in the figure.



Key

1 drain hole

2 compound

Figure B.3 — Flange

Table B.1 — Flange

Dimensions in millimetres

Thread	Nominal pitch diameter d_1	Flange dimension d_2 ±0,3
G 3/4	[a]	24,5
G 2	[a]	57,1

[a] Conforming to ISO 228-1 as inserted.

B.2.2 Materials and configuration

Flanges shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for its intended use.

The specific type of compound shall be agreed between the purchaser and the supplier.

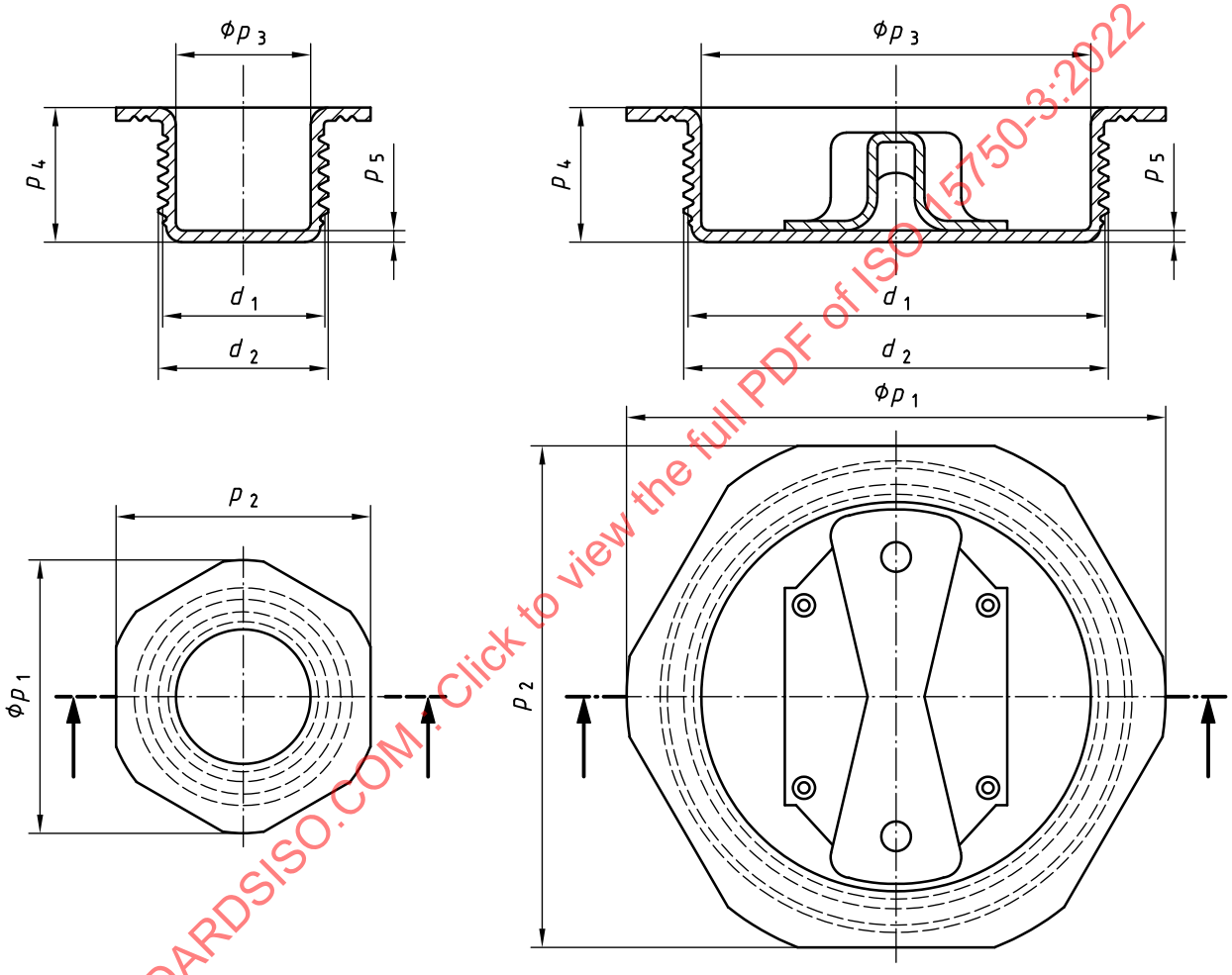
Alternative configurations of the flange should be agreed between the purchaser and the supplier.

B.3 Steel plugs and plug washers

B.3.1 Dimensions

Specific dimensions for steel plugs and elastomer plug washers shall be as shown in Figures B.4 and B.5 and specified in Table B.2.

The steel plugs and elastomer plug washers may deviate from those shown in the figures.



a) G 3/4 thread b) G 2 thread

Figure B.4 — Steel plug

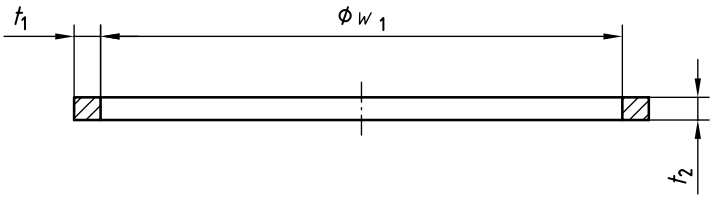


Figure B.5 — Elastomer plug washer

Table B.2 — Steel plugs and elastomer washers

Dimensions in millimetres

Thread	Nominal pitch diameter d_1	Plug dimensions						Elastomer plug washer dimensions $w_1 \times t_1 \times t_2$ ±0,5 × ± 0,8 × ± 0,5
		d_2 ±0,4	p_1 ±0,4	p_2 ±0,4	p_3 min.	p_4 ±0,8	p_5 min.	
G 3/4	[a]	26,3	41,7	38,0	20,1	19,8	1,0	25,4 × 5,4 × 3,0
G 2	[a]	59,0	79,0	73,4	54,0	20,2	1,0	58,0 × 6,4 × 3,0

[a] Conforming to ISO 228-1.

B.3.2 Materials and configuration

Plugs shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for its intended use.

Plug washers should be made of elastomer; however, thermoplastics materials are also acceptable. The specific type of elastomer or thermoplastics shall be agreed between the purchaser and the supplier.

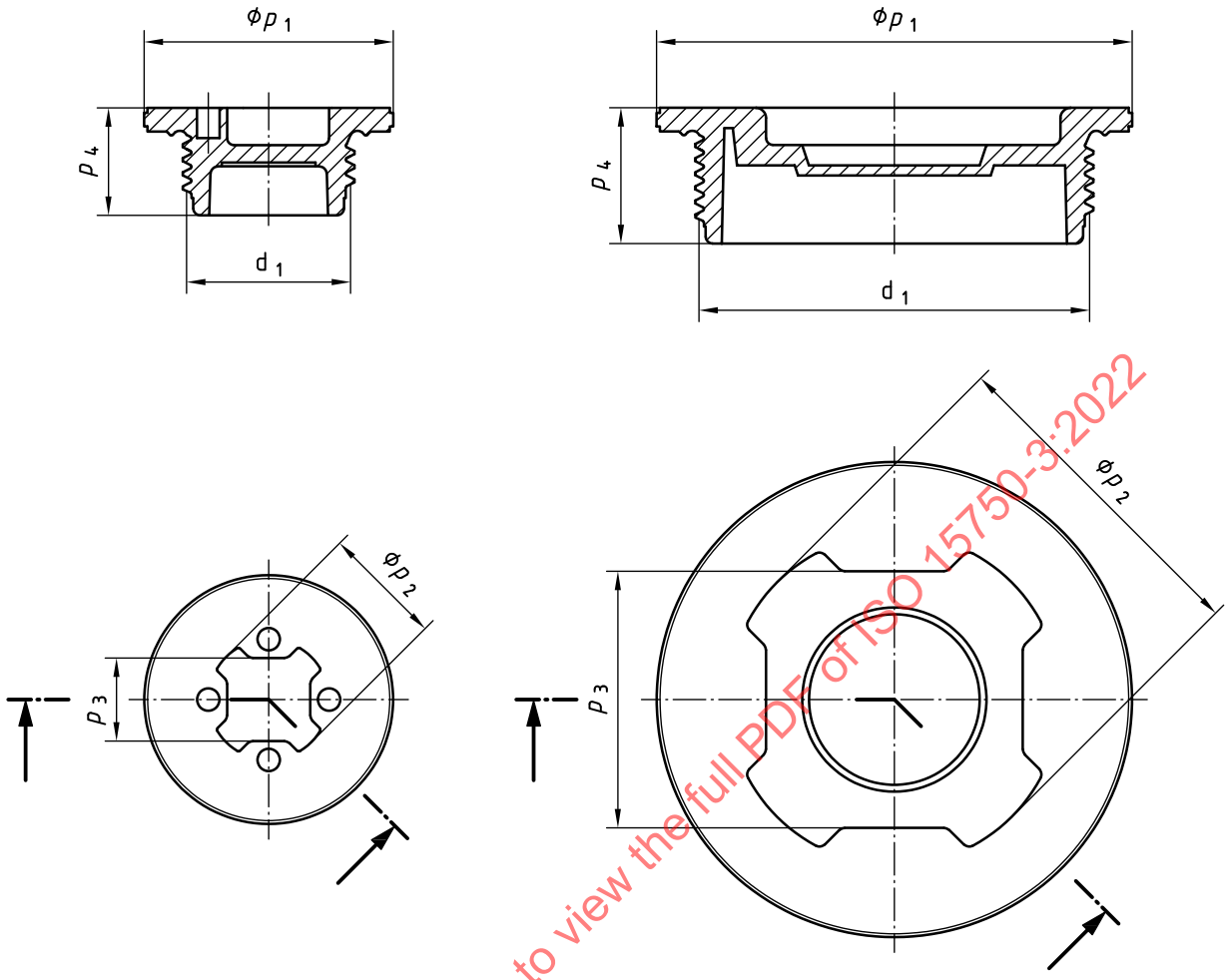
Alternative configurations of the plug and plug washer should be agreed between the purchaser and the supplier.

B.4 Plastics plugs and elastomer plug washers

B.4.1 Dimensions

Specific dimensions for the plastics plugs and elastomer plug washers shall be as shown in Figures B.6 and B.7 and specified in Table B.3.

The plastics plugs and elastomer plug washers may deviate from those shown in the figures.



a) G 3/4 thread

b) G 2 thread

Figure B.6 — Plastics plug

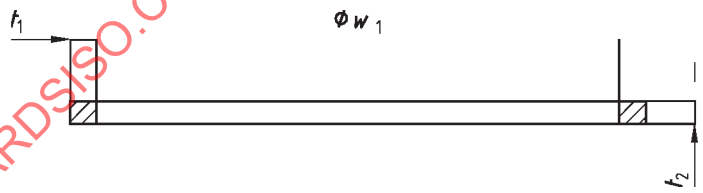


Figure B.7 — Elastomer plug washer

Table B.3 — Plastics plug and elastomer plug washer

Dimensions in millimetres

Thread	Nominal pitch diameter d_1	Plastics plug dimensions				Elastomer plug washer dimensions
		p_1 ±0,9	p_2 min.	p_3 min.	p_4 ±0,8	$w_1 \times t_1 \times t_2$ ±0,5 × ± 0,8 × ± 0,5
G 3/4	[a]	38,7	18,2	6,4	16,1	25,4 × 5,4 × 3,0
G 2	[a]	73,5	51,2	39,9	21,1	58,0 × 6,4 × 3,0

[a] Conforming to ISO 228-1.

B.4.2 Materials and configuration

Plugs shall be made from a copolymer of polypropylene; other suitable materials may be agreed between the purchaser and the supplier.

Plug washers shall be made from elastomer. The specific type of elastomer shall be agreed between the purchaser and the supplier.

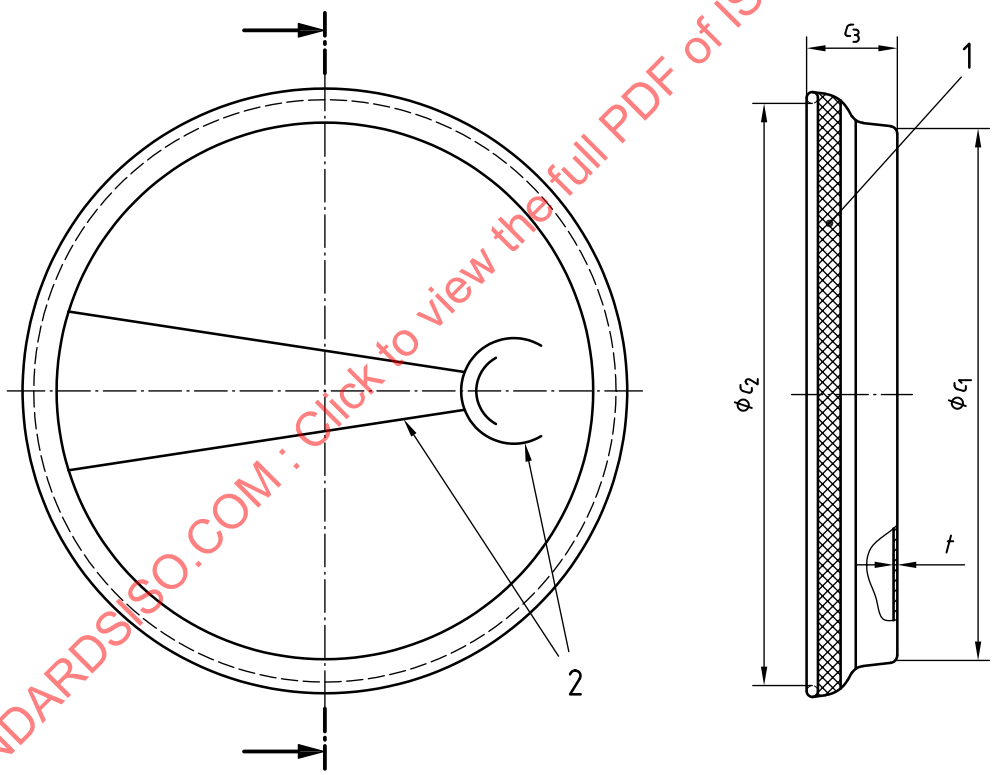
Alternative configurations of plugs and plug washers should be agreed between the purchaser and the supplier.

B.5 Protective covers and metal overseals

B.5.1 Dimensions

Specific dimensions for the protective covers and overseals shall be as shown in Figure B.8 and specified in Table B.4.

The protective covers or overseals may deviate from those shown in the figure.



Key

1 compound

2 scored lines

Figure B.8 — Metal overseal

Table B.4 — Metal overseal

Dimensions in millimetres

Thread	Metal overseal dimensions			Thickness of printed capseals
	c_1 max.	c_2 min.	c_3 max.	t ±0,05
G 3/4	41,5	48,1	13,8	0,23
G 2	78,7	85,6	14,7	0,23
Printing of the overseal (if required) should be agreed between the purchaser and the supplier.				

B.5.2 Materials and configuration

Overseals shall be made from low-carbon sheet steel in accordance with ISO 11949 or ISO 11950, or other material suitable for its intended use.

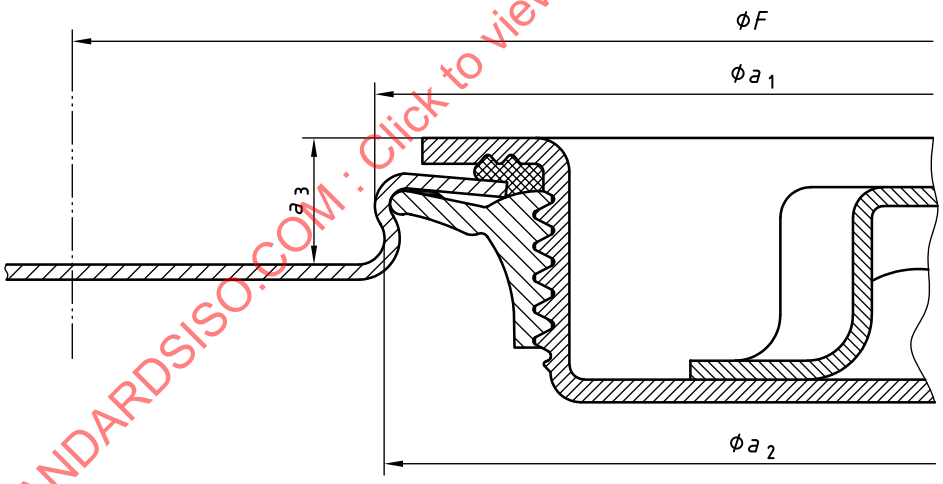
Alternative configurations of the overseal should be agreed between the purchaser and the supplier.

B.6 Closure assembly without overseal

B.6.1 Dimensions

Specific dimensions for the closure assembly without overseal shall be as shown in Figure B.9 and specified in Table B.5.

The closure assembly may deviate from that shown in the figure.



NOTE ISO 15750-1 and ISO 15750-2 require that the closure assembly does not protrude above the drum chime.

Figure B.9 — Assembly without overseal

Table B.5 — Assembly without overseal

Dimensions in millimetres

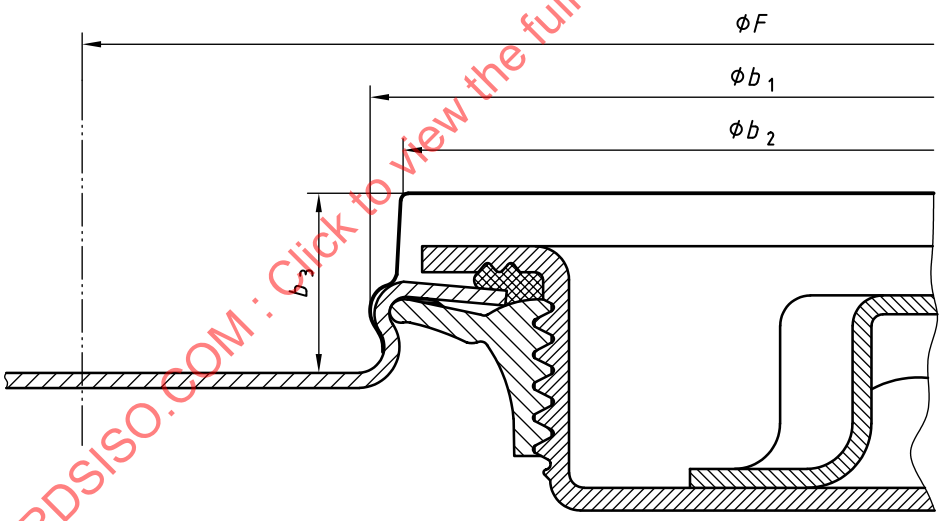
Thread	Closure assembly dimensions			Minimum free space required around closure for overseal application tools
	a_1	a_2	a_3	F
Tolerances	±0,5	±1,7	max.	min.
G 3/4	47,6	45,1	12,7	76,0
Tolerances	±1,0	±2,3	max.	min.
G 2	84,7	81,0	14,0	128,0
The recommendations of the supplier of the closures on insertion of the flanges should be followed if they deviate from the above.				

B.7 Closure assembly with overseal

B.7.1 Dimensions

Specific dimensions for a closure assembly with overseal shall be as shown in Figure B.10 and specified in Table B.6.

The closure assembly may deviate from that shown in the figure.



NOTE ISO 15750-1 and ISO 15750-2 require that the closure assembly does not protrude above the drum chime.

Figure B.10 — Assembly with overseal

Table B.6 — Assembly with overseal

Dimensions in millimetres

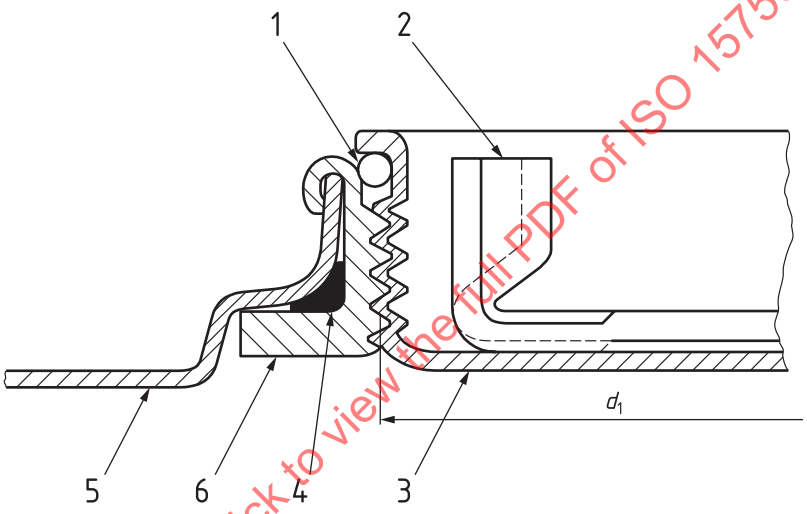
Thread	Closure assembly dimensions			Minimum free space required around closure for capseal application tools
	b_1 ±2,0	b_2 ±1,0	b_3 max.	F
G 3/4	50,1	43,8	15,0	76,0
G 2	86,3	80,6	15,0	128,0
The recommendations of the supplier of the closures on insertion of the flanges should be followed if they deviate from the above.				

Annex C
(normative)

Octagonal (G 2)/hexagonal (G 3/4) base closure system (type C closure)

C.1 Nomenclature for closure system

Closure components of the closure system may deviate from those shown in Figure C.1. However, the specified dimensions shall be followed.



Key

1 plug washer
2 wrenching part
3 plug
4 flange washer
5 drum stock
6 flange
d_1 Nominal pitch diameter.

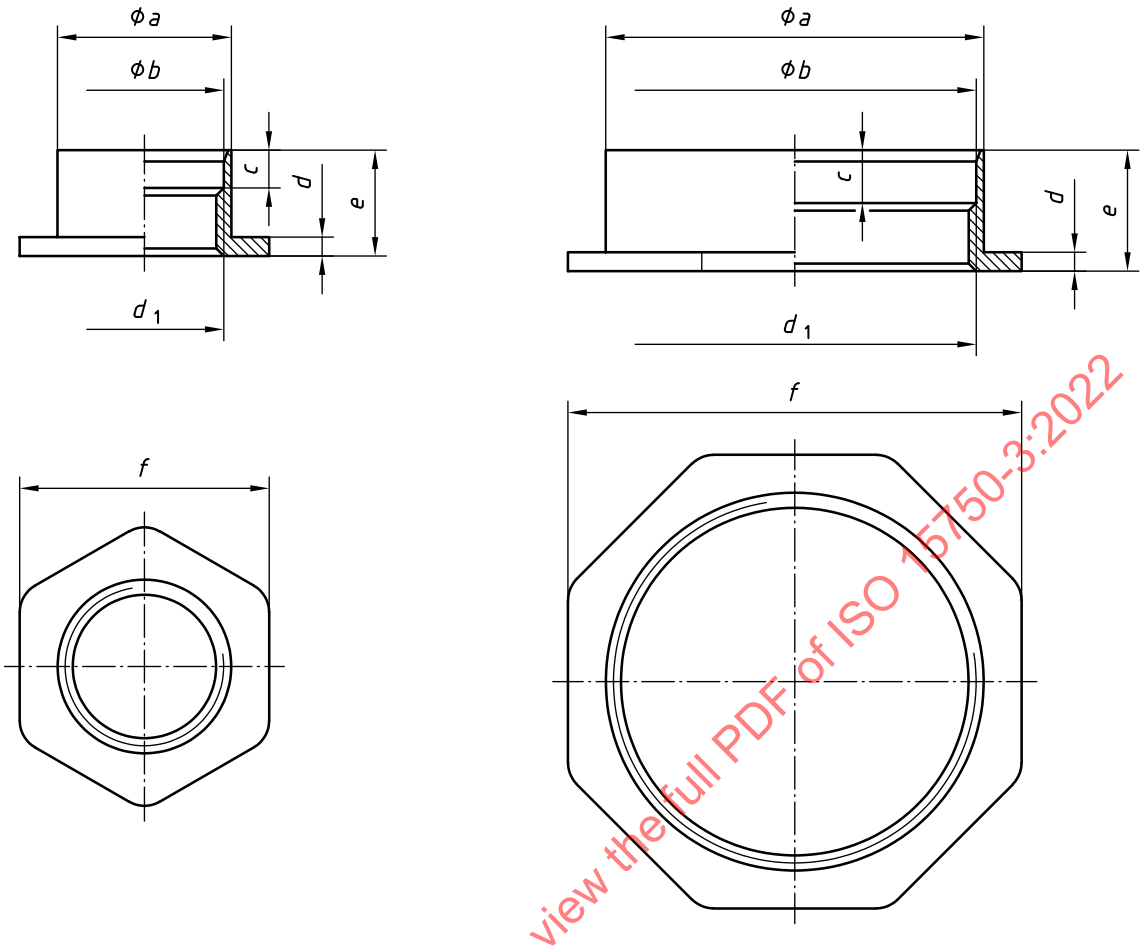
Figure C.1 — Assembly in medium- and heavy-gauge drum stock

C.2 Configuration and dimensions of flanges

C.2.1 Dimensions

Specific dimensions for flanges shall be as shown in Figure C.2 and specified in Table C.1.

The flanges may deviate from those shown in the figure.



a) G 3/4 thread

b) G 2 thread

Figure C.2 — Flange

Table C.1 — Flange

Dimensions in millimetres

Thread	Nominal pitch diameter	Flange dimensions					
		a	*b*	*c*	*d*	*e*	*f*
	d_1	±0,3	±0,3	±0,3	±0,4	±0,4	±0,3
G 3/4	a	30,0	28,2	7,5	3,1	16,8	40,5
G 2	a	63,5	61,2	8,5	3,1	19,0	75,0
a Conforming to ISO 228-1 as inserted.							

C.2.2 Materials and configuration

Flanges shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for its intended use.

The configuration and material of the flange washer(s) should be agreed between the purchaser and the supplier.

Alternative configurations of the flange should be agreed between the purchaser and the supplier.

C.3 Configuration and dimensions of label rings and protection rings

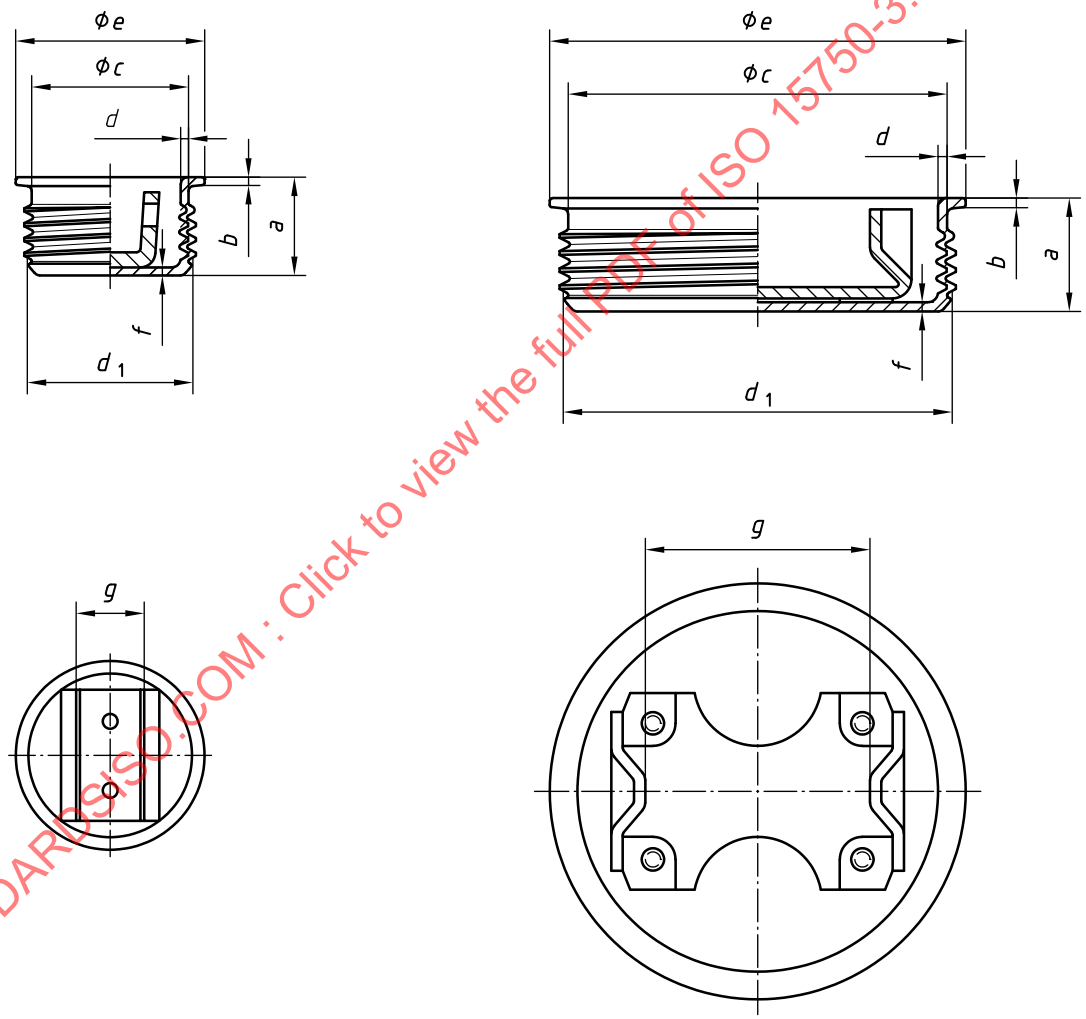
For light-, medium- and heavy-gauge end stock material, label rings and/or protection rings are optional. If such rings are required, rings similar to those specified in A.3 should be used.

C.4 Configuration and dimensions of steel plugs

C.4.1 Dimensions

Specific dimensions for steel plugs shall be as shown in Figure C.3 and specified in Table C.2.

The steel plugs may deviate from those shown in the figure.



a) G 3/4 thread **b) G 2 thread**

Figure C.3 — Steel plug

Table C.2 — Steel plug

Dimensions in millimetres

Thread	Nominal pitch diameter	Plug dimensions						
		a	*b*	*c*	*d*	*e*	*f*	*g*
	d_1	min.	min.	±0,3	min.	±0,5	min.	±1,5
G 3/4	[a]	14,0	1,0	23,7	1,0	28,0	1,0	9,5
G 2	[a]	15,0	1,0	56,0	1,0	61,0	1,0	34,5

[a] Conforming to ISO 228-1.

C.4.2 Materials and configuration

Plugs shall be made from either mild steel in accordance with ISO 3573 or ISO 3574, or another material suitable for its intended use.

The configuration and material specification of the plug washers shall be agreed between the purchaser and the supplier.

Alternative configurations of the plugs should be agreed between the purchaser and the supplier.

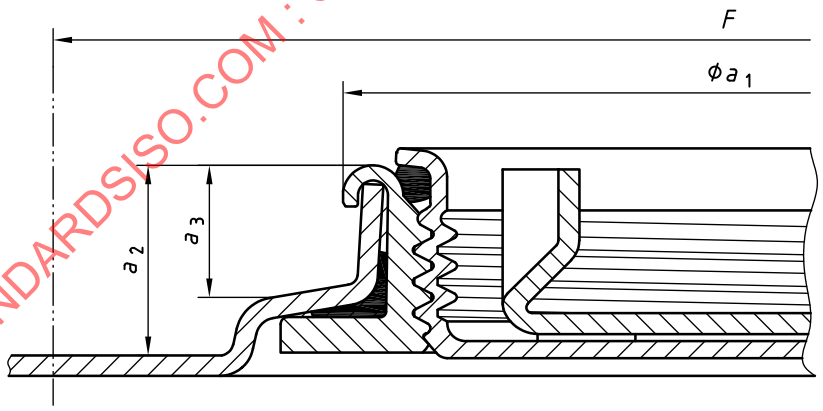
C.5 Configuration and dimensions of capseals

If capseals are required to protect the closures and or the product packed, then capseals similar to those specified in A.6 should be used.

C.6 Assembly without capseal

Specific dimensions for an assembly without capseal shall be as shown in Figure C.4 and specified in Table C.3.

The assembly without capseal may deviate from that shown in the figure.



NOTE ISO 15750-1 and ISO 15750-2 require that the closure assembly does not protrude above the drum chime.

Figure C.4 — Assembly without capseal

Table C.3 — Assembly without capseal

Dimensions in millimetres

Thread	Closure assembly dimensions			Minimum free space required around closure for capseal application tools
	a_1 ±0,5	a_2 ±1,0	a_3 ±1,0	F
G 3/4	35,5	10,9	7,0	90
G 2	69,5	12,5	8,6	110
The recommendations of the supplier of the closures on insertion of the flanges should be followed if they deviate from the above.				

C.7 Washers

C.7.1 Washers for flanges

C.7.1.1 Dimensions

Specific dimensions for the washers for flanges shall be as shown in Figure C.5 and specified in Table C.4.

The washers for flanges may deviate from those shown in the figure.

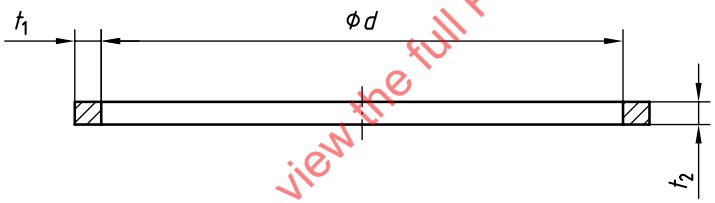


Figure C.5 — Washer for flange

Table C.4 — Washer for flange

Dimensions in millimetres

Thread	Dimension		
	d ±1,0	t_1 ±0,5	t_2 ±0,5
G 3/4	29,0	2,0	2,8
G 2	62,0	2,3	3,0

C.7.1.2 Materials and configuration

The configuration and material specification of the washer for the flange shall be agreed between the purchaser and the supplier.

C.7.2 Washers for plugs

C.7.2.1 Dimensions

Specific dimensions for the washers for plugs shall be as shown in Figure C.6 and specified in Table C.5.

The washers for plugs may deviate from those shown in the figure.