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# INTERNATIONAL STANDARD



# 2853

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Metal pipes and fittings — Stainless steel screwed couplings for the food industry

*Tuyauteries et raccords métalliques — Raccords filetés en acier inoxydable pour l'industrie alimentaire*

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## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2853 was drawn up by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and circulated to the Member Bodies in July 1974.

It has been approved by the Member Bodies of the following countries :

Bulgaria	Israel	Sweden
Chile	Norway	Switzerland
Denmark	Poland	Thailand-2853-1976
France	Romania	Turkey
Hungary	South Africa, Rep. of	United Kingdom
India	Spain	

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Australia  
Germany  
U.S.A.

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# Metal pipes and fittings — Stainless steel screwed couplings for the food industry

## 1 SCOPE

This International Standard specifies the dimensions, tolerances, surface roughness, materials, assembling and hygienic requirements for :

- a) welded and expanded type male parts and liners,
- b) nuts and gaskets,

in screwed pipe couplings with trapezoidal thread for the food industry.

## 2 FIELD OF APPLICATION

Male parts and liners for screwed couplings with trapezoidal threads for the food industry are intended to be applied to stainless steel tubes specified in ISO 2037.

## 3 REFERENCES

ISO 48, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD)*.

ISO/R 79, *Brinell hardness test for steel and cast iron*.

ISO/R 80, *Rockwell hardness test (B and C scales) for steel*.

ISO/R 81, *Vickers hardness test for steel*.

ISO/R 468, *Surface roughness*.

ISO 2037, *Pipes and fittings — Stainless steel tubes for the food industry*.

ISO 2604/II, *Steel products for pressure purposes — Quality requirements — Part II : Wrought seamless tubes*.

## 4 SYMBOLS

$A$  = allowance of male part thread

$B_1$  = inside diameter of support ring

$B_2$  = outside diameter of support ring

$C_1$  = spigot diameter of expanded type male part and liner

$C_2$  = spigot diameter of welded type male part and liner

$C_3$  = inside diameter of hexagon and round nut

$C_4$  = inside diameter of gasket

$C_5$  = inside diameter of expanded type male part and liner

$C_6$  = inside diameter of welded type male part and liner

$C_7$  = outside diameter of expanded and welded type liner

$C_8$  = outside diameter of round nut

$C_9$  = centring inside diameter of nut

$C_{10}$  = outside diameter of neck of welded type male part and liner

$d$  = major diameter of male part thread

$d_1$  = minor diameter of male part thread

$d_2$  = pitch diameter of male part thread

$D$  = major diameter of nut thread

$D_1$  = minor diameter of nut thread

$D_2$  = pitch diameter of nut thread

$E$  = inside diameter of gasket lip

$F_1$  = total length of expanded type male part

$F_2$  = total length of welded type male part and liner

$F_3$  = total length of expanded type liner

$F_4$  = total length of hexagon and round nut

$F_5$  = inside width of support ring

$G_1$  = length of external thread of expanded and welded type male part

$G_2$  = length of internal thread of hexagon and round nut

$H$  = height of fundamental triangle of thread

$J$  = chamfer diameter of round nut

$K$  = length of spigot of expanded and welded type male part and liner

$L_1$  = flange thickness of expanded and welded type liner

$L_2$  = inside flange thickness of hexagon and round nut

$M_1$  = outside diameter of lip of gasket to be used with support ring

$M_2$  = outside diameter of lip of gasket to be used without support ring

$N_1$  = width across slots of round nut

$N_2$  = width across flats of hexagon nut

$O$  = width of slot of round nut

## ISO 2853-1976 (E)

$P$  = pitch of thread

$R_1$  = fillet radius of welded type male part

$R_2$  = fillet radius of welded type liner

$S$  = outside diameter of gasket (lip excluded) to be used with support ring

$T_2$  = length of lip of gasket to be used with support ring

$T_3$  = wall thickness of support ring

$U$  = total thickness of gasket

$V$  = compression thickness of gasket

$w$  = root width of male part threads on GO side profile

$W$  = root width of nut threads on GO side profile

$X_1$  = lock ring groove diameter

$X_2$  = lock ring outside diameter

$\alpha_1$  = angle of chamfer of round nut

$\alpha_2$  = angle of flange of support ring

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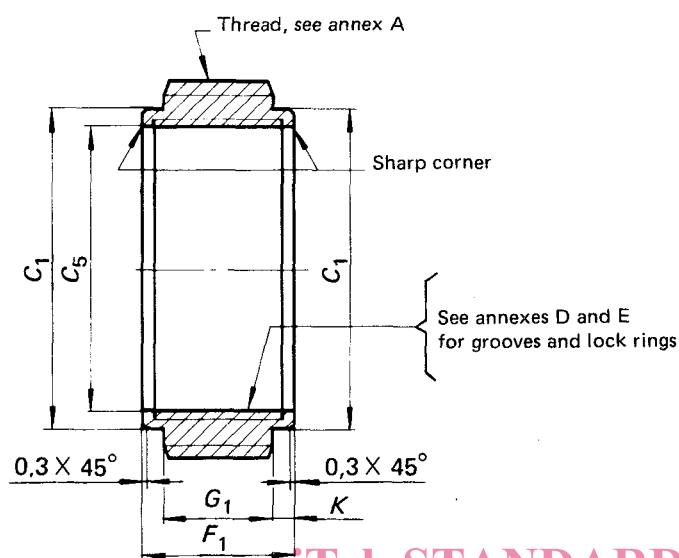
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5 EXPANDED TYPE MALE PART

5.1 Dimensions

$G_1 = 13,5 \text{ mm (0.531 in)}$   
 $K = 3 \text{ mm (0.118 in)}$



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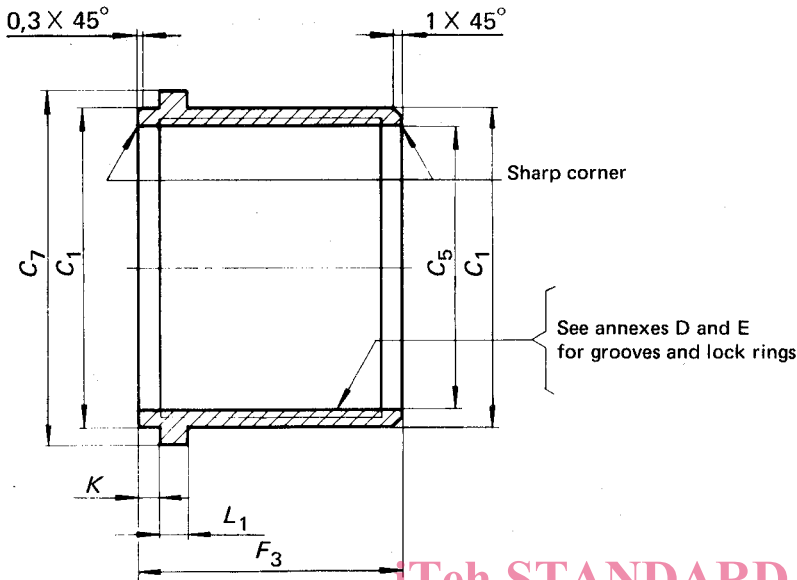
Nominal size		$C_1$		$C_5$		$F_1$	
mm	in	mm	in	mm	in	mm	in
12	—	15,0	0.591	12,0	0.472	17	0.669
18	—	21,2	0.835	18,0	0.709	17	0.669
22	—	25,4	1.000	22,0	0.866	17	0.669
25	—	29,0	1.142	25,0	0.984	17	0.669
28	—	31,8	1.252	28,0	1.102	17	0.669
33,7	1.327	38,0	1.496	33,7	1.327	20	0.787
38	1.500	42,5	1.673	38,0	1.496	20	0.787
40	—	44,5	1.752	40,0	1.575	20	0.787
51	2.000	56,0	2.205	51,0	2.008	20	0.787
63,5	2.500	69,7	2.744	63,5	2.500	25	0.984
70	2.750	76,2	3.000	70,0	2.756	25	0.984
76,1	3.000	82,3	3.240	76,1	2.996	30	1.181
88,9	3.500	95,4	3.756	88,9	3.500	30	1.181
101,6	4.000	108,4	4.268	101,6	4.000	30	1.181

5.2 Tolerances

Spigot diameter  $C_1$  : h10  
 Inside diameter  $C_5$  : A10  
 Total length  $F_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Length of thread  $G_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Length of spigot  $K$  :  $\pm 0,1 \text{ mm (0.004 in)}$

6 EXPANDED TYPE LINER

6.1 Dimensions



$K = 3 \text{ mm (0.118 in)}$   
 $L_1 = 4 \text{ mm (0.157 in)}$

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Nominal size		$C_1$		$C_5$		$C_7$		$F_3$	
mm	in	mm	in	mm	in	mm	in	mm	in
12	—	15,0	0.591	12,0	0.472	19,6	0.772	16	0.630
18	—	21,2	0.835	18,0	0.709	25,8	1.016	18	0.709
22	—	25,4	1.000	22,0	0.866	30,0	1.181	20	0.787
25	—	29,0	1.142	25,0	0.984	33,8	1.331	20	0.787
28	—	31,8	1.252	28,0	1.102	36,6	1.441	20	0.787
33,7	1.327	38,0	1.496	33,7	1.327	42,5	1.673	20	0.787
38	1.500	42,5	1.673	38,0	1.496	47,0	1.850	20	0.787
40	—	44,5	1.752	40,0	1.575	49,0	1.929	20	0.787
51	2.000	56,0	2.205	51,0	2.008	60,5	2.382	25	0.984
63,5	2.500	69,7	2.744	63,5	2.500	74,0	2.913	30	1.181
70	2.750	76,2	3.000	70,0	2.756	80,9	3.185	30	1.181
76,1	3.000	82,3	3.240	76,1	2.996	87,5	3.445	30	1.181
88,9	3.500	95,4	3.756	88,9	3.500	101,0	3.976	30	1.181
101,6	4.000	108,4	4.268	101,6	4.000	114,1	4.492	30	1.181

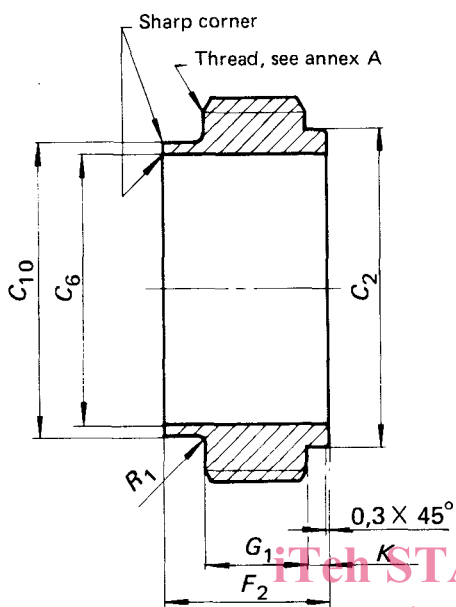
6.2 Tolerances

- Spigot diameter  $C_1$  : h10
- Inside diameter  $C_5$  : A10
- Outside diameter  $C_7$  : h10
- Length of spigot  $K$  :  $\pm 0,1 \text{ mm (0.004 in)}$
- Flange thickness  $L_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$
- Total length  $F_3$  :  $\pm 0,2 \text{ mm (0.008 in)}$



7 WELDED TYPE MALE PART

7.1 Dimensions



$G_1 = 13,5 \text{ mm (0.531 in)}$   
 $F_2 = 21,5 \text{ mm (0.846 in)}$   
 $K = 3 \text{ mm (0.118 in)}$   
 $R_1 = 2,5 \text{ mm (0.098 in)}$

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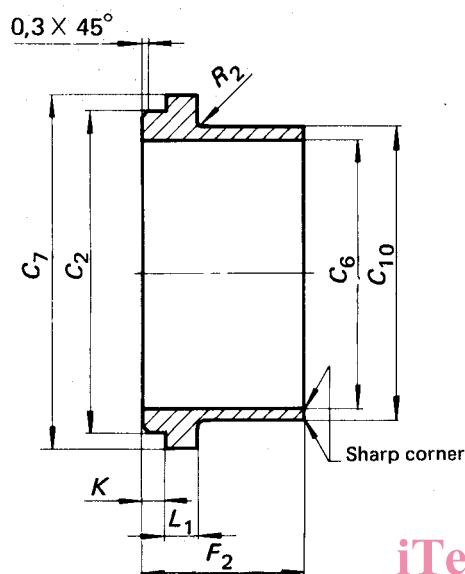
Nominal size		C <sub>2</sub>		C <sub>6</sub>		C <sub>10</sub>	
mm	in	mm	in	mm	in	mm	in
25	—	29,2	1.150	22,6	0.890	25,6	1.008
28	—	32,0	1.260	25,6	1.008	28,6	1.126
33,7	1.327	38,2	1.504	31,3	1.232	34,3	1.350
38	1.500	42,7	1.681	35,6	1.402	38,6	1.520
40	—	44,7	1.760	37,6	1.480	40,6	1.598
51	2.000	56,2	2.213	48,6	1.913	51,6	2.031
63,5	2.500	69,9	2.752	60,3	2.374	64,1	2.524
70	2.750	76,4	3.008	66,8	2.630	70,6	2.780
76,1	3.000	82,6	3.252	72,9	2.870	76,7	3.020
88,9	3.500	95,7	3.768	84,9	3.343	89,8	3.535
101,6	4.000	108,7	4.280	97,6	3.843	102,5	4.035

7.2 Tolerances

Spigot diameter  $C_2$  : h10  
 Inside diameter  $C_6$  : H11  
 Total length  $F_2$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Length of thread  $G_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Length of spigot  $K$  :  $\pm 0,1 \text{ mm (0.004 in)}$   
 Fillet radius  $R_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Outside diameter of neck  $C_{10}$  : h11

8 WELDED TYPE LINER

8.1 Dimensions



$K = 3 \text{ mm (0.118 in)}$   
 $L_1 = 4 \text{ mm (0.157 in)}$   
 $F_2 = 21,5 \text{ mm (0.846 in)}$   
 $R_2 = 2 \text{ mm (0.079 in)}$

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Nominal size		$C_2$		$C_6$		$C_7$		$C_{10}$	
mm	in	mm	in	mm	in	mm	in	mm	in
25	—	29,2	1.150	22,6	0.890	33,8	1.331	25,6	1.008
28	—	32,0	1.260	25,6	1.008	36,6	1.441	28,6	1.126
33,7	1.327	38,2	1.504	31,3	1.232	42,5	1.673	34,3	1.350
38	1.500	42,7	1.681	35,6	1.402	47,0	1.850	38,6	1.520
40	—	44,7	1.760	37,6	1.480	49,0	1.929	40,6	1.598
51	2.000	56,2	2.213	48,6	1.913	60,5	2.382	51,6	2.031
63,5	2.500	69,9	2.752	60,3	2.374	74,0	2.913	64,1	2.524
70	2.750	76,4	3.008	66,8	2.630	80,9	3.185	70,6	2.780
76,1	3.000	82,6	3.252	72,9	2.870	87,5	3.445	76,7	3.020
88,9	3.500	95,7	3.768	84,9	3.343	101,0	3.976	89,8	3.535
101,6	4.000	108,7	4.280	97,6	3.843	114,1	4.492	102,5	4.035

8.2 Tolerances

Spigot diameter  $C_2$  : h10

Inside diameter  $C_6$  : H11

Outside diameter  $C_7$  : h10

Length of spigot  $K$  :  $\pm 0,1 \text{ mm (0.004 in)}$

Flange thickness  $L_1$  :  $\pm 0,2 \text{ mm (0.008 in)}$

Total length  $F_2$  :  $\pm 0,2 \text{ mm (0.008 in)}$

Fillet radius  $R_2$  :  $\pm 0,2 \text{ mm (0.008 in)}$

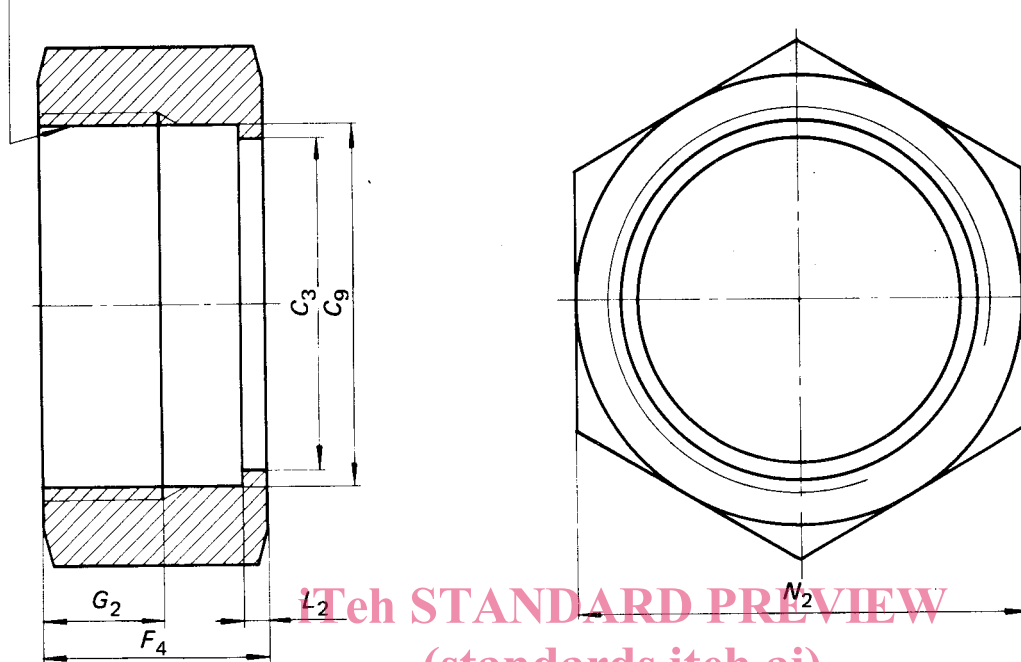
Outside diameter of neck  $C_{10}$  : h11

9 HEXAGON NUT

9.1 Dimensions

$F_4 = 30 \text{ mm (1.181 in)}$   
 $G_2 = 16 \text{ mm (0.630 in)}$   
 $L_2 = 3,5 \text{ mm (0.138 in)}$

Thread, see annex A



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Nominal size		$C_3$		$C_9$		$N_2$	
mm	in	mm	in	mm	in	mm	in
12	—	16,0	0.630	20,10	0.791	32	1.260
18	—	22,2	0,874	26,47	1.042	41	1.614
22	—	26,4	1.039	30,74	1.210	46	1.811
25	—	30,5	1.201	34,34	1.352	46	1.811
28	—	32,8	1.291	37,11	1.461	50	1.969
33,7	1.327	39,0	1.535	43,18	1.700	60	2.362
38	1.500	43,5	1.713	47,86	1.884	60	2.362
40	—	45,5	1.791	49,89	1.964	65	2.560
51	2.000	57,0	2.244	61,37	2.416	75	2.953
63,5	2.500	70,7	2.783	74,88	2.948	90	3.543
70	2.750	77,2	3.039	81,79	3.220	100	3.937
76,1	3.000	83,3	3.280	88,40	3.480	105	4.134
88,9	3.500	97,0	3.819	101,91	4.012	115	4.528
101,6	4.000	110,0	4.331	115,42	4.544	135	5.315

9.2 Tolerances

Inside diameter  $C_3$  : H11  
 Centring diameter  $C_9$  :  $+0,16 \text{ mm (0.006 in)}$   
 0  
 Total length  $F_4$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Length of thread  $G_2$  :  $\pm 1 \text{ mm (0.039 in)}$   
 Inside flange thickness  $L_2$  :  $\pm 0,2 \text{ mm (0.008 in)}$   
 Width across flats  $N_2$  : h15