DEUTSCHE NORM December 1998

Compression fittings and couplings

DIN 2353

ICS 23.040.60

Supersedes June 1991 edition.

Lötlose Rohrverschraubungen mit Schneidring – Vollständige Verschraubung und Übersicht

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

Contents

Page

Foreword ... 1

1 Scope ... 2

2 Normative references ... 2

3 Coupling assemblies ... 2

3.1 Stud fittings with type C (taper) stud end as in DIN 3852-1 and DIN 3852-2 ... 2

3.2 Stud fittings with type A or B (male) stud end as in DIN 3852-1 and DIN 3852-2 ... 5

3.3 Union fittings ... 7

3.4 Bulkhead fittings ... 7

3.5 Swivel adaptors ... 7

3.6 Weld-on or weld-in fittings ... 7

Page

4 Connecting dimensions and length of free pipe end ... 7

5 Parts list ... 9

6 Materials ... 10

7 Design features ... 10

7.1 Ports and compression ends ... 10

7.2 Stud ends ... 10

7.3 Finish ... 10

8 Technical delivery conditions ... 10

Foreword

This standard has been prepared by the *Arbeitsausschuß Rohrverschraubungen* (Compression Couplings Standards Committee).

Amendments

This standard differs from the June 1991 edition as follows:

a) DIN 2353 has been completely revised. It now specifies only those fittings and coupling assemblies which are not covered in DIN EN ISO 8434-1.

b) S 14 series stud ends are no longer specified.

Previous editions

DIN 2353: 1958-04, 1966-06, 1991-06.

Continued on pages 2 to 10.

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

© No part of this translation may be reproduced without the prior permission of *DIN Deutsches Institut für Normung e. V.*, Berlin.
Beuth Verlag GmbH, D-10772 Berlin, has the exclusive right of sale for German Standards *(DIN-Normen)*.

Ref. No. DIN 2353 : 1998-12
English price group 08 *Sales No. 0108*
11.99

1 Scope

This standard specifies the design and dimensions of compression fittings and couplings, with stud ends in compliance with DIN 3852-1, DIN 3852-2 or DIN 3852-11, as well as ISO 6149-1, ISO 6149-2 and ISO 6149-3, which are made from standardized components and are not covered in ISO 8434-1.

See clause 5 for list of coupling assembly components.

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

DIN 2391-1	Seamless precision steel tubes – Dimensions
DIN 3852-1	Stud ends and tapped holes with metric fine pitch thread, for use with compression couplings, valves and screw plugs – Dimensions
DIN 3852-2	Stud ends and tapped holes with pipe thread, for use with compression couplings, valves and screw plugs – Dimensions
DIN 3852-11	Type E stud ends and tapped holes for use with compression couplings, valves and screw plugs – Dimensions
DIN 3853	Compression couplings – Compression ends for coupling nuts
DIN 3859-1	Compression couplings – Part 1: Technical delivery conditions*)
DIN 3861	Compression rings (ferrules) for use with compression couplings – Design and type W compression ends (ports)
DIN 3870	Compression couplings – Coupling nuts
DIN 3871	Compression couplings – Male fittings
DIN 3900	Compression couplings – Compression couplings with tapered stud end
DIN 3901	Compression couplings – Male stud compression couplings
DIN 3903	Compression couplings – Taper stud elbows
DIN 3904	Compression couplings – Male stud elbows
DIN 3906	Compression couplings – Taper stud tees (stud branch)
DIN 3907	Compression couplings – Male stud tees (stud branch)
DIN 3913	Compression couplings – Taper stud tees (stud run)
DIN 3914	Compression couplings – Male stud tees (stud run)
DIN 3955	Compression couplings – Male stud coupling assemblies
DIN 7603	Washers for compression coupling assemblies and screw plugs
DIN 50942	Phosphating metals – Principles and testing
DIN 80705	Thin nuts with coarse or fine pitch thread and with small widths across flats
DIN EN ISO 8434-1	Metallic tube connections for fluid power and general use – Part 1: 24° compression fittings (ISO 8434-1 : 1994)
ISO 4042 : 1989	Threaded components – Electroplated coatings
ISO 6149-1 : 1993	Connections for fluid power and general use – Ports and stud ends with ISO 261 threads and O-ring sealing – Part 1: Ports with O-ring seal in truncated housing
ISO 6149-2 : 1993	Connections for fluid power and general use – Ports and stud ends with ISO 261 threads and O-ring sealing – Part 2: Heavy-duty (S series) stud ends – Dimensions, design, test methods and requirements
ISO 6149-3 : 1993	Connections for fluid power and general use – Ports and stud ends with ISO 261 threads and O-ring sealing – Part 3: Light-duty (L series) stud ends – Dimensions, design, test methods and requirements

3 Coupling assemblies

3.1 Stud fittings with type C (taper) stud end as in DIN 3852-1 and DIN 3852-2

It is recommended not to adopt the L and S series of fittings with tapered stud end for new designs. In these cases, types C and D fittings should be used instead of types A and B, and types DD, EE and FF swivel adaptors together with DIN 3901 straight (male stud) fittings instead of types F, G, M, N, AA, and AB.

*) At present at draft stage.

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

Tightness cannot be guaranteed, since this is a function of the medium conveyed, the working pressure and temperature, and the combination of materials used. Depending on the application, it is therefore recommended that a type C stud end with a seal be used.

Straight fitting
Type A, with metric thread
Type B, with pipe thread

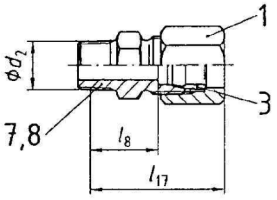


Figure 1: Straight fitting

Elbow
Type F, with metric thread
Type G, with pipe thread

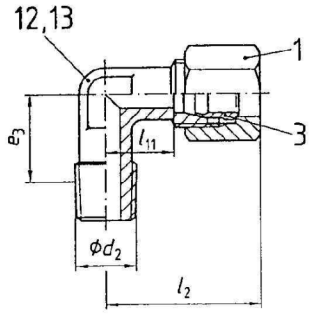


Figure 2: Elbow

Branch tee
Type M, with metric thread
Type N, with pipe thread

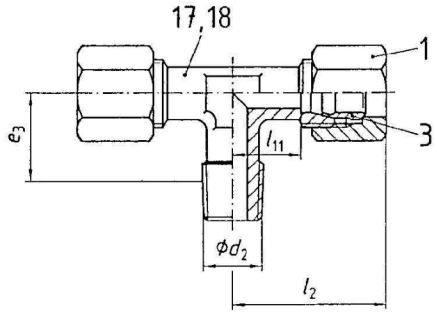


Figure 3: Branch tee

Run tee
Type AA, with metric thread
Type AB, with pipe thread

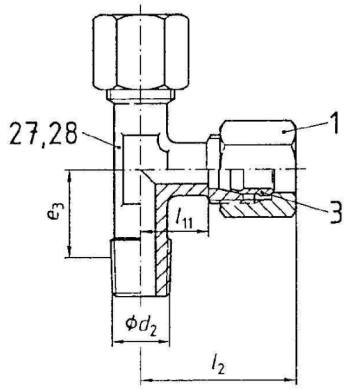


Figure 4: Run tee

Designation of a straight fitting with metric thread (A), extra-light duty series (LL), in steel (St), for an 8 mm pipe outside diameter (8):

Fitting DIN 2353 – ALL 8 – St

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

Table 1: Dimensions of fittings with taper stud end

Series	Pipe outside diameter	Rated for a nominal pressure, in bar, of [1]	Thread size (d_2) of type C stud end (as in DIN 3852-1 and DIN 3852-2) for types		Approx. installed length (with nut tightened)		Approx. distance from centre to pipe,	Approx. pipe clear distances		Approx. mass per 100 units, in kg, for types *)			
			A, AA, F, M [2]	B, AB, G, N [2]	l_{17}	l_2	e_3	l_8	l_{11}	A, B	M, N [3]	F, G [3]	AA, AB [3]
LL (extra-light duty)	**4**	100	M 8 × 1 keg	R 1/8	20	21	12	10,5	11	1,4	2,4	1,4	2,5
	5		M 8 × 1 keg	R 1/8	20,5	21	12	9	9,5	1,5	2,6	1,5	2,7
	6		M 10 × 1 keg	R 1/8	20,5	21	12	9	9,5	1,6	2,7	1,6	2,8
	8		M 10 × 1 keg	R 1/8	23,5	23	15	11	11,5	1,8	4,1	2,3	3,8
L (light duty)	**6**	250	M 10 × 1 keg	R 1/8	–	27	15	–	12	–	5,1	2,0	5,6
	8		M 12 × 1,5 keg	R 1/4	–	29	18	–	14	–	7,2	3,6	7,7
	10		M 14 × 1,5 keg	R 1/4	–	30	19	–	15	–	10,0	5,2	10,0
	12		M 16 × 1,5 keg	R 3/8	–	32	20	–	17	–	12,6	7,3	13,1
	15		M 18 × 1,5 keg	R 1/2	–	36	24	–	21	–	20,5	13,0	21,0
	18	160	M 22 × 1,5 keg	R 1/2	–	40	26,5	–	23,5	–	30,4	16,6	30,4
S (heavy duty)	**6**	400	M 12 × 1,5 keg	R 1/4	–	31	18	–	16	–	8,9	5,2	8,9
	8		M 14 × 1,5 keg	R 1/4	–	32	19	–	17	–	11,4	6,4	10,4
	10		M 16 × 1,5 keg	R 3/8	–	34	20	–	17,5	–	15,0	9,7	16,0
	12		M 18 × 1,5 keg	R 3/8	–	38	20	–	21,5	–	19,6	10,8	19,6
	16		M 22 × 1,5 keg	R 1/2	–	43	22,5	–	24,5	–	30,9	18,9	32,3

*) For fittings made of steel, taking the density of steel as 7,85 kg/dm^3.
[1]) Applies only to steel couplings (cf. DIN 3859-1 for technical delivery conditions).
[2]) Specifications for type A and B coupling assemblies have only been made for the LL series.
[3]) The values specified apply to a forged body.

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

3.2 Stud fittings with type A or B (male) stud end[1]) as in DIN 3852-1 and DIN 3852-2
(figures show type A male stud end)

Straight fitting[2])
Type C, with metric thread
Type D, with pipe thread

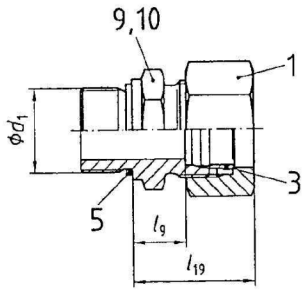


Figure 5: Straight fitting

Elbow
Type H, with metric thread
Type J, with pipe thread

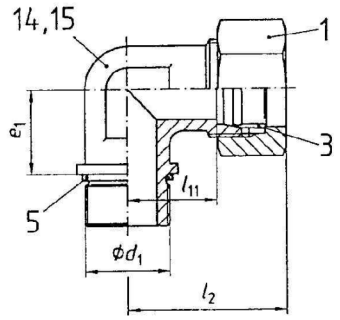


Figure 6: Elbow

Branch tee
Type O, with metric thread
Type P, with pipe thread

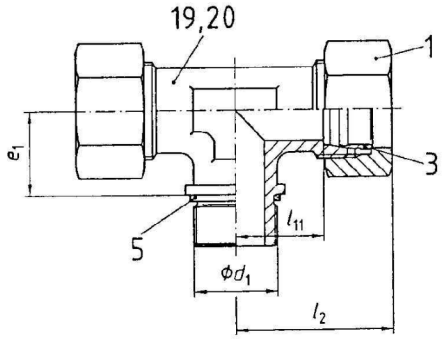


Figure 7: Branch tee

Run tee
Type BA, with metric thread
Type BB, with pipe thread

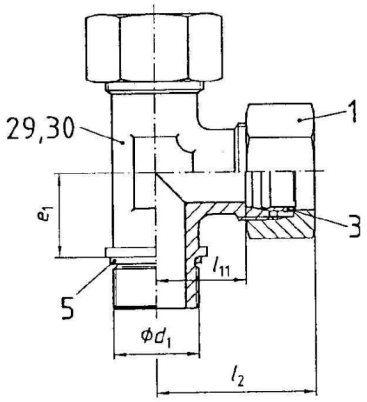


Figure 8: Run tee

Designation of a straight fitting with pipe thread (D), heavy-duty series (S), in steel (St), for a 12 mm pipe outside diameter (12):

Fitting DIN 2353 – DS 12 A – St

Note that certain fittings permit the use of larger thread sizes. The fitting given in the above designation, for example, may be supplied with a thread of size G $^1/_2$, in which case the designation should be amended to read:

Fitting DIN 2353 – DS 12 A – G $^1/_2$ – St

[1]) Cf. subclause 7.2.1.
[2]) With type A stud end.

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

Table 2: Dimensions of fittings with male stud end

Series	Pipe outside diameter	Rated for a nominal pressure, in bar, of[1]	Thread size (d_1) of stud end (as in DIN 3852-1 and DIN 3852-2) for types		Approx. installed length (with nut tightened), l_{19}	Approx. pipe clear distances, l_9		Approx. mass per 100 units, in kg, for types*)	
			C	D		DIN 3852	ISO 6149	C	D
LL (extra-light duty)	**4**	100	M 8 × 1	G 1/8 A	20	9,5	–	1,5	1,5
	5		M 8 × 1	G 1/8 A	20	8	–	1,7	1,7
	6		M 10 × 1	G 1/8 A	20	8	–	1,9	1,9
	8		M 10 × 1	G 1/8 A	21	9	–	2,0	2,0
L (light duty)	**6**	250	M 10 × 1	G 1/8 A	23	8,5	9,5	2,5	2,5
	8		M 12 × 1,5	G 1/4 A	25	10	10	4,0	4,5
	10		M 14 × 1,5	G 1/4 A	26	11	11	4,7	4,7
	12		M 16 × 1,5	G 3/8 A	27	12,5	12,5	6,3	6,9
	15		M 18 × 1,5	G 1/2 A	29	14[2]	13,5	9,5	11,5
	18	160	M 22 × 1,5	G 1/2 A	31	14,5	14,5	12,9	12,9
	22		M 26 × 1,5	G 3/4 A	33	16,5	16,5	17,6	17,6
	28	100	M 33 × 2	G 1 A	34	17,5	17,5	24,7	24,7
	35		M 42 × 2	G 1 1/4 A	39	17,5	17,5	40,7	40,7
	42		M 48 × 2	G 1 1/2 A	42	19	19	45,6	45,6
S (heavy duty)	**6**	630	M 12 × 1,5	G 1/4 A	28	13	13	4,5	5,0
	8		M 14 × 1,5	G 1/4 A	30	15	15	5,5	5,5
	10		M 16 × 1,5	G 3/8 A	31	15	15	8,2	8,2
	12		M 18 × 1,5	G 3/8 A	33	17	17	10,5	9,5
	12[3]		–	G 1/2 A[3]	34	17,5	–	–	13,5
	16	400	M 22 × 1,5	G 1/2 A	37	18,5	18,5	15,4	15,4
	16[3]		–	G 3/4 A[3]	39	20,5	–	–	21,8
	20		M 27 × 2	G 3/4 A	42	20,5	20,5	25,3	25,3
	25		M 33 × 2	G 1 A	47	23	23	46,5	46,5
	30	250	M 42 × 2	G 1 1/4 A	50	23,5	23,5	64,4	64,4
	38		M 48 × 2	G 1 1/2 A	57	26	26	88,9	88,9

*) For fittings made of steel, taking the density of steel as 7,85 kg/dm^3.
[1]) Applies only to steel fittings (cf. DIN 3859-1 for technical delivery conditions).
[2]) In the case of fittings with an outside diameter of 15 mm (metric thread), l_9 shall be 13,5 mm.
[3]) Only permitted for special applications.

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

Table 3: Dimensions of elbows, branch tees and run tees

Series	Pipe outside diameter	Rated for a nominal pressure, in bar, of[1])	Thread size (d_1) of stud end (as in DIN 3852-1 and DIN 3852-2) for types		Approx. distance from centre to pipe, e_1	Approx. installed length (with nut tightened), l_2	Approx. pipe clear distance, l_{11}	Approx. mass per 100 units, in kg, for types*)		
			BA, H, O	BB, J, P				H, J	O, P	BA, BB
L (light duty)	**22**	160	M 26 × 1,5	G 3/4 A	26	44	27,5	24,6	38,7	42,7
	28	100	M 33 × 2	G 1 A	30	47	30,5	34,7	64,5	75,0
	35		M 42 × 2	G 1 1/4 A	34	56	34,5	61,2	108,9	108,9
	42		M 48 × 2	G 1 1/2 A	39	63	40	84,6	153,3	163,3
S (heavy duty)	**20**	400	M 27 × 2	G 3/4 A	26	48	26,5	30,3	48,8	50,2
	25		M 33 × 2	G 1 A	30	54	30	58,0	52,9	87,1
	30	250	M 42 × 2	G 1 1/4 A	34	62	35,5	74,4	116,9	118,4
	38		M 48 × 2	G 1 1/2 A	39	72	41	98,9	166,9	168,8

*) For fittings made of steel, taking the density of steel as 7,85 kg/dm^3.
[1]) Applies only to steel couplings (cf. DIN 3859-1 for technical delivery conditions).

3.3 Union fittings

See DIN EN ISO 8434-1.

3.4 Bulkhead fittings

See DIN EN ISO 8434-1.

3.5 Swivel adaptors

See DIN EN ISO 8434-1.

3.6 Weld-on or weld-in fittings

See DIN EN ISO 8434-1.

4 Connecting dimensions and length of free pipe end

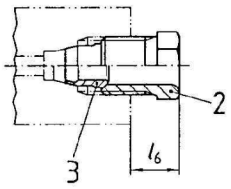


Figure 9: Male fitting
(to be inserted in appliance)

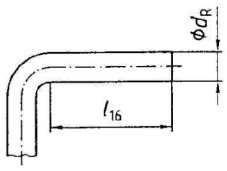


Figure 10: Length of free pipe end

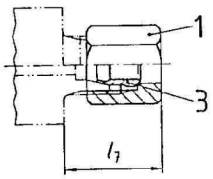


Figure 11: Set-on coupling nut
(to be fitted to appliance)

A certain length of free pipe end is required to facilitate assembly.

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

Table 4: Connecting dimensions and length of free pipe end

Series	Pipe outside diameter, d_R	Rated for a nominal pressure, in bar, of[1)]	Approx. installed length (with nut or male fitting tightened)		Approx. length of free pipe end, l_{16}
			l_6	l_7	
LL (extra-light duty)	**4**	100	6	14	19
	5		7	14	21
	6		7	14	21
	8		8	15	21
L (light duty)	**6**	250	10	18	25
	8		10	18	25
	10		10	19	26
	12		10	19	26
	15		–	20	28
	18	160	–	21	30
	22		–	23	32
	28	100	–	23	34
	35		–	27	41
	42		–	28	41
S (heavy duty)	**6**	630	–	20	27
	8		–	20	27
	10		–	21	29
	12		–	21	29
	16	400	–	24	33
	20		–	27	39
	25		–	30	44
	30	250	–	33	48
	38		–	37	55

[1)] Applies only to steel fittings (cf. DIN 3859-1 for technical delivery conditions).

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V. - English
Licensed by Information Handling Services

5 Parts list

Table 5: Parts list

Figure no.	Fitting or coupling type	Name and designation		Item no(s).	Number of items	Jointing and sealing elements (number of items)				
		Name	Designation			for item no.	for item no.	for item no.	for item no.	for item no.
1	A and B	Straight fitting (taper)	Fitting DIN 3900 – ...[1])	7, 8	1	1	–	1	–	–
5	C and D	Straight fitting (male stud)	DIN 3901 – ...[1])	9, 10	1	1	–	1	–	1[4])
2	F and G	Taper stud elbow	Elbow DIN 3903 – ...[1])	12, 13	1	1	–	1	–	–
6	H and J	Male stud elbow	Elbow DIN 3904 – ...[1])	14, 15	1	1	–	1	–	1[4])
3	M and N	Taper stud tee	Tee DIN 3906 – ...[1])	17, 18	1	2	–	2	–	–
7	O and P	Male stud tee	Tee DIN 3907 – ...[1])	19, 20	1	2	–	2	–	1[4])
4	AA and AB	Taper stud tee (stud run)	Tee DIN 3913 – ...[1])	27, 28	1	2	–	2	–	–
8	BA and BB	Male stud tee (stud run)	Tee DIN 3914 – ...[1])	29, 30	1	2	–	2	–	1[4])
9	Male fitting	–	–	–	–	–	1	1	–	–
11	Nut	–	–	–	–	1	–	1	–	–
Jointing and sealing elements		Union nut[3])	DIN EN ISO 8434-1 – ...[1])							
		Male fitting	DIN 3871 – ...[1])							
		Compression ring (ferrule)[3])	DIN EN ISO 8434-1 – ...[1])							
		Nut	DIN EN ISO 8434-1 – ...[1])							
		Washer[2])	DIN 7603 – ...[1])							

[1]) Symbols for items to be appended to the designation are to be taken from the relevant standard.
[2]) DIN 7603 washers shall be ordered separately.
[3]) The union nuts and ferrules fitted in the couplings or fittings, as illustrated in the relevant standards, are not itemized here.
[4]) Only to be used together with a type A stud end complying with DIN 3852-1 or DIN 3852-2.

6 Materials

The standard material of compression fittings and couplings shall be steel, as specified in DIN 3859-1. Other materials specified in DIN 3859-1 shall be the subject of agreement, and the relevant symbol appended to the standard designation.

7 Design features

7.1 Ports and compression ends

Ports shall be of type W as specified in DIN 3861, compression ends shall be in compliance with DIN 3853.

7.2 Stud ends

7.2.1 Male stud ends (d_1)

Type A: Sealed by washer (cf. DIN 3852-1 and DIN 3852-2, type A).

Type B: Sealed by compression against face of fitting or coupling body (cf. DIN 3852-1 and DIN 3852-2, type B).

Type E: Sealed by ring seal (cf. DIN 3852-11, type E).

Type F: Sealed by O-ring (cf. ISO 6149-2 and ISO 6149-3).

7.2.2 Taper stud ends (d_2)

Type C: Joint made pressure-tight on the thread. Threaded end as in DIN 3852-1 or DIN 3852-2.

7.3 Finish

The standard finish shall be A3C or A3L in accordance with ISO 4042. Other types of finish specified in ISO 4042 shall be the subject of agreement, and the relevant symbol appended to the standard designation.

8 Technical delivery conditions

The technical delivery conditions specified in DIN 3859-1 shall apply.

Other relevant standards

DIN 3858	Pipe threads for compression couplings – Parallel internal threads and metric taper external threads – Thread dimensions
DIN 3859-2	Compression couplings as specified in DIN 2353 – User instruction
ISO 228-1 : 1994	Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances an designation

COPYRIGHT DIN DEUTSCHES Institut Fur Normung E.V.- English
Licensed by Information Handling Services