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AIR LIQUIDE

Pipe Class Specification PN 40

Tube parts catalogue Pipe class: AA40C1

1	**Aim**	Aim of this guideline is the specification of tube parts under defined operating conditions under consideration of the requirements of guideline 97/23/EC (Pressure equipment guideline)
2	**Scope**	Air Liquide Deutschland GmbH
3	**Material**	1.0254 (St 37.0)
4	**Pipe class**	Standard pipe class according to leaflet AD-2000
5	**Seal form**	Form B1 according to DIN EN 1092-1
6	**Corrosion surcharge**	1,00 mm
7	**Screws**	Hexagon head screw 5.6 Hexagon nut 5-2
8	**Permitted media**	argon, compressed air, rare gases, natural gas, carbon dioxyide, oxygen, nitrogen hydrogen, and its mixtures in gaseous form
9	**Operating pressure**	16 bar
10	**Operating temperature**	from 263 K (-10°C) to 393 K (120°C)

ND	15	20	25	32	40	50	65	80	100	125	150	200	250
d_a/mm	21,3	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3	139,7	168,3	219,1	273
s/mm	2	2,3	2,6	2,6	2,6	2,9	2,9	3,2	3,6	4	4,5	6,3	5

ND	300	350	400	500	600								
d_a/mm	323,9	355,6	406,4	508	610								
s/mm	7,1	8	8,8	11	12,5								

11	**Safety notices**	The flow rate of conducting gaseous oxygen is not allowed to exceed 25 m/s in tubes of this class with operating pressures > 1 bar.

Vertical impacting gaseous oxygen to the tube wall must be avoided; therefore turns in branches are not allowed to occur in sharp kinks but only in bendings.

To avoid a weakening of the wall thickness at bending tubes, the bending radius must not fall below a value of 5 D.

When using Elbows according to DIN, the bending radius may fall below this value.

Tubes leading oxygen must be free of oil, grease, welding beads and processing shavings and comply with standard 06401.

12 Additional notices

At operating temperatures 50 °C < TS <= 120 °C flanges of the next higher pressure level must be used.

When using hydrogen, comb defined seals only must be provided for flange joints.

The application fields (medium, pressure, temperature) defined in the standards 4002, 4007 and 4008 must be absolutely adhered to.

Tube part	nom. width		iden-tifica-tion	dimension standard / terms of delivery	certificate
	from	to			
Flat packings	15	500	FLD	DIN EN 1514-1, Standard 06401	BAM-admission according to BAM-Tbg.-Nr. 10881/85/4-3723
Fibrous packings	15	500	FAD	DIN EN 1514-1, Standard 40007	2.1 according to DIN EN 1024 concerning purity in accordance with Standard 06401
Caps	15	600	KAP	DIN 2617, DIN 2609	3.1.B according to DIN EN 10204
Comb defined seals	15	500	KAD	DIN 2617, Standard 40008	2.1 according to DIN EN 1024 concerning purity in accordance with Standard 06401
Elbow 90° R=1,5 DA, welded	200	600	RB1,5DG	DIN 2605-1, DIN 2609	3.1.B according to DIN EN 10204
Elbow 90° R=2,5 DA, welded	200	600	RB2,5DG	DIN 2605-1, DIN 2609	3.1.B according to DIN EN 10204
Reducer, eccentric, welded	400	500	RZEG	DIN 2616-1, DIN 2609	3.1.B according to DIN EN 10204
Pipe, welded	200	600	RG	DIN EN 10220, DIN 1626	3.1.B according to DIN EN 10204
Reducer, concentric, welded	400	500	RZKG	DIN 2616-1, DIN 2609	3.1.B according to DIN EN 10204
Pipe, seamless	15	150	RN	DIN EN 10220, DIN 1629	3.1.B according to DIN EN 10204
Tee made of welded pipe	400	500	TG	DIN 2615-1, DIN 2609	3.1.B according to DIN EN 10204
Welding neck flanges	15	500	VF	DIN EN 1092-1, DIN EN 1092-1	3.1.B according to DIN EN 10204
Reducer, eccentric, seamless	20	300	RZEN	DIN 2616-1, DIN 2609	3.1.B according to DIN EN 10204
Reducer, concentric, seamless	20	300	RZKN	DIN 2616-1, DIN 2609	3.1.B according to DIN EN 10204
Tee made of seamless pipe	15	350	TN	DIN 2615-1, DIN 2609	3.1.B according to DIN EN 10204
Elbow 90° R=1,5 DA, seamless	15	150	RB1,5DN	DIN 2605-1, DIN 2609	3.1.B according to DIN EN 10204
Elbow 90° R=2,5 DA, seamless	15	150	RB2,5DN	DIN 2605-1, DIN 2609	3.1.B according to DIN EN 10204
Blanks	15	500	BSS	Uhde-Norm 3902-1, DIN EN 10025	3.1.B according to DIN EN 10204
Blind flanges	15	500	BF	DIN EN 1092-1, DIN EN 1092-1	3.1.B according to DIN EN 10204
Hexagon head screws	12	39	SKS	DIN EN ISO 4014, DIN EN ISO 898-1 / DIN EN ISO 4014	3.1.B according to DIN EN 10204
Hexagon nuts	12	39	SKM	DIN EN ISO 4032, DIN EN ISO 898-2 / DIN EN ISO 4032	3.1.B according to DIN EN 10204

10 **Valid and listed documents**

Standard 06401
Standard 40002
Standard 40007
Standard 40008
AD 2000-leaflet
BAM-Tgb.-Nr. 10881/85, 4-3723
DGRL 97/23/EG
DIN 1626
DIN 1629
DIN 2605-1
DIN 2909
DIN 2615-1
DIN 2616-1
DIN 2617
DIN EN 1092-1
DIN EN 1514-1
DIN EN 10025
DIN EN 10204
DIN EN 10220
DIN EN ISO 898-1
DIN EN ISO 898-2
DIN EN ISO 4014
DIN EN ISO 4032
Uhde-Norm 3902-1

Pipe Class Specification PN 40	pipe parts * pipe class: A pipe, seamless

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1	**Pipe class**	AA40C1
2	**Part identification**	RN
3	**Pipe class part**	pipe, seamless
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN EN 10220
6	**Terms of delivery**	DIN 1629
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 1629, section 6
9	**Ordering addition**	Pipes at fixed length of 6 m Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps Requirements AD 2000-leaflet W4, especially section 5, must be met

Ident-No.	nom. diameter ND	dimensions d_a x s	weights kg
19750	15	21,3 x 2	0,95
19751	20	26,9 x 2,3	1,40
19752	25	33,7 x 2,6	1,99
19753	32	42,4 x 2,6	2,55
19754	40	48,3 x 2,6	2,93
19755	50	60,3 x 2,9	4,11
19756	65	76,1 x 2,9	5,24
19757	80	88,9 x 3,2	6,76
19758	100	114,3 x 3,6	9,38
19759	125	139,7 x 4	13,40
19760	150	168,3 x 4,5	18,20

10	**Valid an listed documents**	AD 2000-leaflet W4 DIN 1629 DIN EN 10204 DIN EN 10220

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Pipe Class
Specification PN 40

pipe parts * pipe class: AA40C1
pipe, welded

1	**Pipe class**	AA40C1
2	**Part identification**	RG
3	**Pipe class part**	pipe, welded
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN EN 10220
6	**Terms of delivery**	DIN 1626
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 1626, section 6
9	**Ordering addition**	Pipes at fixed length of 6 m Calculation stress: 100% Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps Requirements AD 2000-leaflet W4, especially section 5, must be met An inspection certificate 3.1.C is required as proof, if the manufacturer does not meet the requirements according to AD 2000-leaflet W4, section 2.2

Ident-No.	nom. diameter ND	dimensions d_a x s	weights kg
19743	200	219,1 x 6, 3	33,10
19744	250	273 x 6,3	41,40
19745	300	323,9 x 7,1	55,50
19746	350	355,6 x 8	68,60
19747	400	406,4 x 8,8	86,30
19748	500	508 x 11	135,00
19749	600	610 x 12,5	184,00

10	**Valid and listed documents**	AD 2000-leaflet W4 DIN 1626 DIN EN 10204 DIN EN 10220

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Pipe Class
Specification PN 40

pipe parts * pipe class: AA40C1
Elbow 90° R=1,5 DA, seamless

1	**Pipe class**	AA40C1
2	**Part identification**	RB1,5DN
3	**Pipe class part**	Elbow 90° R=1,5 DA, seamless
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN 2605-1
6	**Terms of delivery**	DIN 2609
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 2609, section 6
9	**Ordering addition**	Elbow 90°, type 3, with decreased utilization factor, made of seamless pipe according to DIN 1629 Weld preparation according to DIN 2559-1 and DIN 2559-2 Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps Requirements AD 2000-leaflet W4, especially section 5, must be met

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	ND	d_a x s	kg	s_R
19768	15	21,3 x 2	0,04	2,00
19769	20	26,9 x 2,3	0,06	2,30
19770	25	33,7 x 2,6	0,12	2,60
19771	32	42,4 x 2,6	0,19	2,60
19772	40	48,3 x 2,6	0,26	2,60
19773	50	60,3 x 2,9	0,49	2,90
19774	65	76,1 x 5	1,31	2,90
19775	80	88,9 x 5,6	2,06	3,20

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	ND	d_a x s	kg	s_R
19776	100	114,3 x 6,3	4,01	3,60
19777	125	139,7 x 6,3	6,18	4,00
19778	150	168,3 x 7,1	10,14	4,50

10 Valid and listed documents

AD 2000-leaflet W4
DIN 2559-1
DIN 2559-3
DIN 2605-1
DIN 2609
DIN EN 10204

AIR LIQUIDE

Pipe Class
Specification PN 40

pipe parts * pipe class: AA40C1
Elbow 90° R=1,5 DA, welded

1	**Pipe class**	AA40C1
2	**Part identification**	RB1,5DG
3	**Pipe class part**	Elbow 90° R=1,5 DA, welded
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN 2605-1
6	**Terms of delivery**	DIN 2609
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 2609, section 6
9	**Ordering addition**	Elbow 90°, type 3, with decreased utilization factor, made of welded pipe according to DIN 1626 Weld preparation according to DIN 2559-1 and DIN 2559-3 Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps equirements AD 2000-leaflet W4, especially section 5, must be met An inspection certificate 3.1.C is required as proof, if the manufacturer does not meet the requirements according to AD 2000-leaflet W4, section 2.2

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	ND	d_a x s	kg	s_R
19761	200	219,1 x 6,3	15,86	6,30
19762	250	273 x 8,8	34,29	6,30
19763	300	323,9 x 10	55,56	7,10
19764	350	355,6 x 11	78,28	8,00
19765	400	406,4 x 12,5	115,94	8,80
19766	500	508 x 11	0,00	11,00
19767	600	610 x 12,5	0,00	12,50

10	**Valid and listed documents**	AD 2000-leaflet W4 DIN 2559-1 DIN 2559-3 DIN 2605-1 DIN 2609 DIN EN 10204

AIR LIQUIDE

Pipe Class
Specification PN 40

pipe parts * pipe class: AA40C1
Elbow 90° R=2,5 DA, seamless

1	**Pipe class**	AA40C1
2	**Part identification**	RB2,5DN
3	**Pipe class part**	Elbow 90° R=2,5 DA, seamless
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN 2605-1
6	**Terms of delivery**	DIN 2609
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 2609, section 6
9	**Ordering addition**	Elbow 90°, type 5, with decreased utilization factor, made of seamless pipe according to DIN 1629 Weld preparation according to DIN 2559-1 and DIN 2559-2 Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps Requirements AD 2000-leaflet W4, especially section 5, must be met

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	DN	d_a x s	kg	s_R
19786	15	21,3 x 2	0,06	2,00
19787	20	26,9 x 2,3	0,13	2,30
19788	25	33,7 x 2,6	0,23	2,60
19789	32	42,4 x 2,6	0,37	2,60
19790	40	48,3 x 2,6	0,49	2,60
19791	50	60,3 x 2,9	0,87	2,90
19792	65	76,1 x 2,9	1,44	2,90
19793	80	88,9 x 3,2	2,18	3,20

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	DN	d_a x s	kg	s_R
19794	100	114,3 x 3,6	4,17	3,60
19795	125	139,7 x 6,3	10,73	4,00
19796	150	168,3 x 7,1	17,28	4,50

10 Valid and listed documents

AD 2000-leaflet W4
DIN 2559-1
DIN 2559-2
DIN 2605-1
DIN 2609
DIN EN 10204

AIR LIQUIDE

Pipe Class
Specification PN 40

pipe parts * pipe class: AA40C1
Elbow 90° R=2,5 DA, welded

1	**Pipe class**	AA40C1
2	**Part identification**	RB2,5DG
3	**Pipe class part**	Elbow 90° R=2,5 DA, welded
4	**Material**	1.0254 (St 37.0)
5	**Dimension standard**	DIN 2605-1
6	**Terms of delivery**	DIN 2609
7	**Certificate**	3.1.B according to DIN EN 10204
8	**Identification**	DIN 2609, section 6
9	**Ordering addition**	Elbow 90°, type 5, with decreased utilization factor, made of welded pipe according to DIN 1626 Weld preparation according to DIN 2559-1 and DIN 2559-3 Inner surfaces free of oil, grease and slip additive (max.: 200 mg/m^2) Ends closed with caps Requirements AD 2000-leaflet W4, especially section 5, must be met An inspection certificate 3.1.C is required as proof, if the manufacturer does not meet the requirements according to AD 2000-leaflet W4, section 2.2

Ident-No.	nom. diameter	dimensions	weights	pipe connection wall thickness
	ND	d_a x s	kg	s_R
19779	200	219,1 x 6,3	26,52	6,30
19780	250	273 x 8,8	42,27	6,30
19781	300	323,9 x 10	67,56	7,10
19782	350	355,6 x 11	91,59	8,00
19783	400	406,4 x 12,5	131,49	8,80
19784	500	508 x 11	0,00	
19785	600	610 x 12,5	0,00	

10	**Valid and listed documents**	AD 2000-leaflet W4 DIN 2559-1 DIN 2559-3 DIN 2605-1 DIN 2609 DIN 2616 DIN EN 10204