

VE-LOCK Single Ferrule Bite type fittings are Flareless Metric 24° Cone fittings that consists of a Body , a nut and a Progressive Ring ( Ferrule ) , Two cutting edges of the Progressive Ring " BITE " in to the outer surface of the tube ensuring the necessary holding power for the high pressure.

Available in three sizes , the VE-LOCK bite type fittings and accessories are manufactured in accordance with DIN 2353 Standards. The tube fittings and components listed in this catalogue are intended solely for the assembly of the connections for fluid applications

**Standard Material Specifications**

- Steel Fittings : Materials see DIN 3859
- Stainless Steel Fitting : X6CrNiMoTi 17122 in accordance with DIN 17440, Material No. 1.14571
- Brass Fitting : CuZn35Ni2 in accordance with DIN 17660/17672, Material No. 2.0540
- Elastomer Seal : NBR(BUNA-N), DIN 17660FPM(VITON)

**Pressure and Temperature Load Capability**

Working Pressure

Series	Pressure Rating			
	Steel (DIN3859)/Brass		SS316 (DIN 17440/1.4571)	
	Size	Pressure(Bar)	Size	Pressure(Bar)
LL(Very light)	4 - 8	100	4 - 12	100
	6 - 18	315	6 - 15	250
L(Light)	22 - 42	160	18 - 22	160
	6 - 14	630	6 - 14	630
S(Heavy)	16 - 30	400	16 - 25	400
	38	315	30 - 38	315

\*Working pressure - The nominal pressure(PN) as referred to in DIN2401, part 1 draft

Permissible operating temperature (TB) range for fitting materials

Material of Fittings	Temperature Ratings
316 Stainless Steel	-67°C upto + 400°C (DIN17440)
Carbon Steel	-40°C upto + 120°C (DIN 3859)
Brass	-60°C upto + 175°C

The specification in the pressure reductions section are to be observed here

**For Sealing Materials**

Sealing Material	Temperature Ratings
NBR	- 35° C upto +100°C
FPM	- 25° C upto +200°C
PTFE	- 60° C upto +240°C

\* ED - Ring and O - Ring of NBR Standard



**CAUTION**

When combining the different fitting and sealing materials the lowest temperature limit in each case is applicable

**Pressure Reductions**

Recommended pressure reductions(determined by the fluid medium) for higher service temperature

Material of Fittings	Temperature Rating	Reduction of Pressure
Carbon Steel Brass 316 Stainless Steel (1.4571)	-60°C upto + 20°C	
	+ 50°C	4%
	+100°C	11%
	+200°C	20%
	+300°C	29%
	+400°C	33%
	-40°C upto +120°C	-
	-60°C upto +175°C	30%

\* For different material of tubes and fitting. The tubes must be tested separately concerning the allowed temperature range and the necessary reduction of pressure.

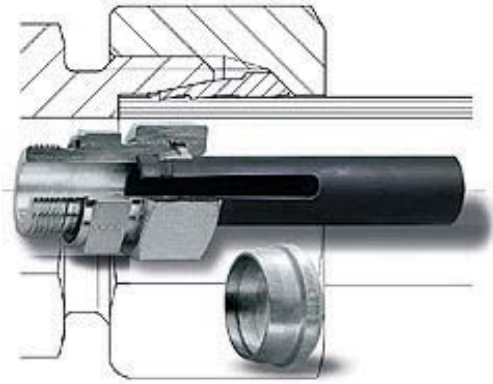
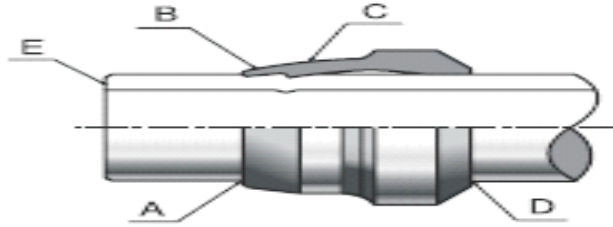


Fig.3

As per the shown Fig- 3 - pls check above

A ridge of metal {A} has been raised above the tube surface to a height of at least 50% Of the thicknessof the Ferrule leading edge completely around the tube.

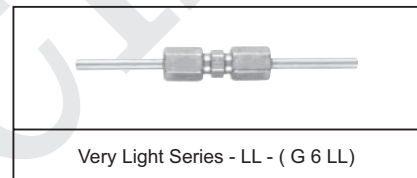
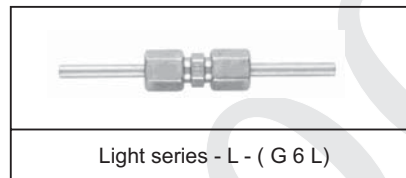
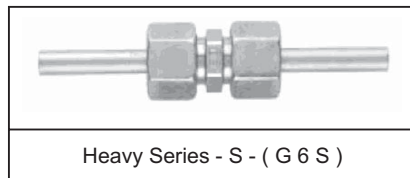
While the leading edge of the FERRULE may be coined flat {B} there is slight bow to the balance of the pilot section {C}

The tail or back and of the FERRULE is snug against the tube {D}

There is a slight indentation around the end of the tube {E} that indicates the tube was bottomed in the biting tool.

Avoid rotating the FERRULE by tightening but the FERRULE should not move front or back beyond the biting area.  
( stainless steel FERRULE will move more then steel because of its spring back characteristics)

**Three Series of Fittings in Single Ferrule Bite type Fittings**



Example of order -no.	G06ZLLA3C	G06ZLA3C	G06ZSA3C
Design	Very Light	Light	Rigid
Performance			
Pn(bar)	100	160-315	315-630
Pmax(bar)	250	250-500	420-900
Suitability for heavy duty applications	Good	Very Good	Excellent
Tube Dimension	4, 6, 8, 10, 12	6, 8, 10, 12, 15, 18, 22, 28, 35, 42	6, 8, 10, 12, 14, 16, 20, 25, 30, 38
Assembly			
Tightening effort	Very Low	Normal	High
Space requirement	Very Low	Low	High
Typical Applications	Central Lubrication Airbrake systems Fuel Lines Oil/Gas stoves Micro Hydraulics	Machine tools Agricultural Vehicles	Hydraulic presses Plastic injection molding Steel mills Shipbuilding Mobile construction equipment
Conclusion	Very light design for space limited assemblies in low to medium pressure applications	Medium to high pressure fitting for general use in hydraulic and pneumatic systems	Rigid design for use in heavy-duty applications

**Tubing guide**

**Seamless precision steel tube St 37.4**

We recommend the use of seamless precision steel tubes with dimensions to DIN 2391, part 1, material St 37.4 to DIN 1630, TYPE NBK. The following tube wall thickness are suitable for use:

Tube O.D. (mm)	Tolerance (mm)	Wall thickness (mm)	Tube I.D. (mm)	Design Pressure(bar)		Weight (kg/m)
				DIN2413 I Static	DIN2413 III Dynamic	
4	0.1	0.5	3	313	274	0.047
		0.75	2.5	4.9	391	0.060
		1.0	2	522	502	0.074
5	0.1	1.0	3	432	416	0.099
6	0.1	0.75	4.5	333	289	0.103
		1.0	4	389	372	0.123
		1.5	3	549	526	0.166
		2.0	2	692	662	0.197
		2.25	5	757	725	0.208
8	0.1	1.0	6	333	288	0.173
		1.5	5	431	412	0.240
		2.0	4	549	526	0.296
10	0.1	2.5	3	658	630	0.339
		1.0	8	235	209	0.271
		1.5	7	373	357	0.314
12	0.08	2.0	6	478	458	0.395
		2.5	5	576	551	0.462
		3.0	4	666	638	0.518
		1.0	10	235	209	0.271
		1.5	9	353	303	0.389
14	0.08	2.0	8	409	391	0.493
		2.5	7	495	474	0.586
		3.0	6	576	551	0.606
		3.5	5	651	624	0.734
		1.0	12	201	182	0.321
15	0.08	1.5	11	302	625	0.462
		2.0	10	403	343	0.592
		2.5	9	434	417	0.709
		3.0	8	507	487	0.614
		3.5	7	576	553	0.906
16	0.08	4	6	576	553	0.986
		1.0	13	188	171	0.345
		1.5	12	282	248	0.499
		2.0	11	336	321	0.641
		2.5	10	409	391	0.771
18	0.08	3.0	9	478	458	0.888
		1.0	14	176	160	0.370
		1.5	13	264	234	0.536
		2.0	12	353	303	0.691
		2.5	11	386	370	0.832
20	0.08	3.0	10	452	433	0.962
		1.0	16	157	143	0.419
		1.5	15	235	209	0.610
		2.0	14	313	273	0.789
		2.5	13	348	333	0.958
22	0.08	3.0	12	409	391	1.110
		1.5	17	212	191	0.684
		2.0	16	282	249	0.888
		2.5	15	353	303	1.080
		3.0	14	373	357	1.060
25	0.08	3.5	13	426	408	1.424
		4.0	12	478	458	1.578
		2.0	19	192	174	0.758
		2.5	18	256	227	0.986
		3.0	17	320	278	1.202
28	0.08	3.0	16	343	328	1.406
		2.0	21	226	201	1.134
		2.5	20	282	248	1.387
		3.0	19	338	292	1.628
		4.0	17	394	378	2.072
30	0.08	4.5	16	437	418	2.275
		5.0	15	478	458	2.466
		1.5	25	151	139	0.980
		2.0	24	201	181	1.282
		2.5	23	252	223	1.572
35	0.15	3.0	22	302	264	1.850
		4.0	20	357	342	2.368
		5.0	18	434	415	2.836
		2.0	26	188	171	1.381
		2.5	25	235	210	1.695
38	0.15	3.0	24	282	248	2.000
		4.0	22	336	321	2.570
		5.0	20	409	391	3.080
		2.0	31	161	147	1.630
		2.5	30	201	181	2.000
42	0.2	3.0	29	242	215	2.370
		4.0	27	322	280	3.060
		5.0	25	357	342	3.690
		6.0	23	419	401	4.290
		2.5	33	186	168	2.189
48	0.15	3.0	32	223	200	2.589
		4.0	30	297	260	3.350
		5.0	28	332	318	4.075
		6.0	26	390	373	4.740
		7.0	24	446	427	5.350
54	0.2	2.0	28	134	124	1.973
		3.0	26	203	181	2.890
		4.0	34	269	237	3.750

Tube O.D. (mm)	Tolerance (mm)	Wall thickness (mm)	Tube I.D. (mm)	Design Pressure(bar)		Weight (kg/m)
				DIN2413 I Static	DIN2413 III Dynamic	
22	0.08	15	19	192	174	0.758
		2.0	18	256	227	0.986
		2.5	17	320	278	1.202
25	0.08	3.0	16	343	328	1.406
		2.0	21	226	201	1.134
		2.5	20	282	248	1.387
		3.0	19	338	292	1.628
		4.0	17	394	378	2.072
28	0.08	4.5	16	437	418	2.275
		5.0	15	478	458	2.466
		1.5	25	151	139	0.980
		2.0	24	201	181	1.282
		2.5	23	252	223	1.572
30	0.08	3.0	22	302	264	1.850
		4.0	20	357	342	2.368
		5.0	18	434	415	2.836
		2.0	26	188	171	1.381
		2.5	25	235	210	1.695
35	0.15	3.0	24	282	248	2.000
		4.0	22	336	321	2.570
		5.0	20	409	391	3.080
		2.0	31	161	147	1.630
		2.5	30	201	181	2.000
38	0.15	3.0	29	242	215	2.370
		4.0	27	322	280	3.060
		5.0	25	357	342	3.690
		6.0	23	419	401	4.290
		2.5	33	186	168	2.189
42	0.2	3.0	32	223	200	2.589
		4.0	30	297	260	3.350
		5.0	28	332	318	4.075
		6.0	26	390	373	4.740
		7.0	24	446	427	5.350
48	0.2	2.0	28	134	124	1.973
		3.0	26	203	181	2.890
		4.0	34	269	237	3.750

**Tubeing guide****Seamless precision stainless steel 1.4571**

Stainless steel tube (e.g. 1.4571), code X6CrNiMoTi 17122, must be cold-drawn and seamless, heat-treated without formation of scale, type m to Din 17458, provide tolerances to DIN2391, Part 1

Tube O.D. (mm)	Tolerance (mm)	Wall thickness (mm)	Tube I.D. (mm)	Design Pressure(bar)		Weight (kg/m)
				DIN2413 I Static	DIN2413 III Dynamic	
6	+0.1	1.0	4	426	330	0.125
8	±0.1	1.0	6	368	256	0.175
		1.5	5	472	366	0.224
10	±0.08	1.0	8	294	209	0.225
		1.5	7	389	301	0.319
		2.0	6	498	386	0.401
12	±0.08	1.0	10	245	177	0.275
		1.5	9	368	256	0.394
		2.0	8	426	330	0.501
14	±0.08	1.5	11	315	223	0.469
		2.0	10	420	289	0.601
		2.5	9	452	351	0.720
15	±0.08	1.0	13	196	143	0.351
		1.5	12	294	209	0.507
		2.0	11	392	271	0.651
16	±0.08	2.0	12	368	256	0.701
		2.5	11	403	312	0.845
		3.0	10	475	366	0.977

Tube O.D. (mm)	Tolerance (mm)	Wall thickness (mm)	Tube I.D. (mm)	Design Pressure(bar)		Weight (kg/m)
				DIN2413 I Static	DIN2413 III Dynamic	
18	+0.08	1.5	15	245	177	0.620
		2.0	14	327	230	0.801
20	+0.08	2.0	16	294	209	0.901
		2.5	15	368	256	1.095
		3.0	14	309	301	1.277
22	+0.08	1.5	19	200	146	0.770
		2.0	18	267	192	1.002
25	+0.08	2.5	2	294	209	1.408
		3.0	19	353	247	1.653
28	+0.08	1.5	25	158	177	0.995
		2.0	24	210	153	1.302
30	+0.08	3.0	24	294	209	2.028
		4.0	22	392	271	2.605
35	+0.15	2.0	31	168	124	1.653
38	+0.15	4.0	3	309	219	3.405
		5.0	28	387	268	4.131
42	+0.2	2.0	39	140	104	2.003
		3.0	36	210	153	2.930

\* Tube Which need a Support Sleeve for assembly in Single Ferrule Bite Type Tube Fittings

**Material selection : Sealing Material**

Tube Material: Fitting Material:	Steel Steel	Stainless Steel Stainless Steel	Copper Brass	Stainless Steel Steel	Plastic Steel, Stainless Steel, Brass
<b>Performance Characteristics:</b> Pressure Capability	Excellent	Excellent	Good	Good	Low
External Temperature Capability	Very Good	Excellent	Very Good	Very Good	Depending on tube and material
Corrosion resistance	Good	Very Good	Excellent	Good	
Internal media Compatibility	Good	Excellent	Very Good	Good	
<b>Assembly Characteristics:</b> progressive Ring	Excellent	Preassembly	Support sleeves VH might be required	Preassembly with stainless steel progressive ring	Support sleeves H mandatory support sleeves H
Rubber Female	Excellent	Excellent	Not available	Mandatory	Mandatory
Weld nipple	Excellent	Excellent	Not possible	Special functional Nut, FM ... SSA required not possible	Not possible
Typical applications:	Machine tools, Mobile construction equipment	Shipbuilding, Offshore exploration, Process engineering, Paper machines	Central lubrication systems, Pneumatics	Some airbrake systems in railway industry wet machining area on machine tools	Pneumatic systems on machine tools central lubrication and air brakes in truck industry
Current use	Standard material combination for general use in hydraulic systems	Standard material combination for use with aggressive media or application in corrosive	Low to medium pressure applications in corrosive environment. Use with compressed air (condensed water) or slightly corrosive media(water)	Special material combination for slightly corrosive environments	Special material combination for low pressure applications

Sealing Technology	Metal-to-Metal	Nitrile rubber (NBR)	Fluorcarbon(FPM)
<b>Performance Characteristics:</b> High pressure capability	Good	Excellent	Excellent
Low temperature capability High temperature capability Media Compability Long term reliability	Excellent Excellent Excellent Good	Very good Good Good Excellent	Good Very Good Very Good Excellent
<b>Assembly Characteristics:</b> Ease of initial assembly Repeated assembly Replacement of seal	Good Good Not possible	Excellent Excellent Easy	Excellent Excellent Easy
Typical applications	Process engineering Agricultural Equipment	Machine tools Hydraulic presses Mobile construction Equipment	Steelmill equipment Casting machines
Current use	Suitable for aggressive media respectively for very low or very high temperatures	General use in - hydraulic - pneumatic - lubrication - airbrake systems	Hydraulic and pneumatic systems with high operating temperature process engineering: some aggressive media

VE-LOCK Tube Fittings from steel are delivered worldwide with a high quality surface protection like Galvanised Yellow Zinc ( A3C according to DIN / ISO 4042 )

VE-LOCK YELLOW ZINC PLATED or CHROME ( VI ) Free - Trivalent Plated

The Requirements for corrosion resistance of tube fittings have been increasing in the past few years . To increase the shelf life of fittings, the manufacturer has to go for surface protection.

**An galvanized deposit Zinc layer offers the following advantages :-**

The corrosion resistance increases significantly due to a plating of minimum 8 micron and additional sealing by chromating process. In case of scratches or nicks - which are not avoidable during the assembly or handling - zinc develops a cathodical protection of the steel fitting body against localised corrosion & abrasion. The gold Yellow colour due to the chromating process offers an attractive appearance.

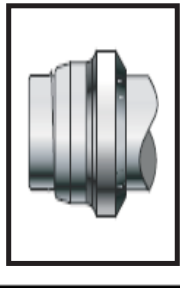
Homogeneous thickness of plating should not be more than 13 micron which will allow good screwable threads & fitments.

Continuous corrosion testes Like - SALT Spray Tests according to DIN 50021 / 5 % NACL show an average resistance of 100 h in contrast to white rust and 350 h in contrast to red rust.

Materials	Code	Surface protection / Surface						
		A3C Zinc plated Yellow chromated	A3C +Glide coating	A3C Zinc plated Green chromated	Znphr5f black phosphated	Bright no coating	Blank +Glide coating	Blank +Inside silver
Steel	Fitting body	X						
	Nuts		X					
	Progressive ring			X				
	EO-2 Functional nuts		X					
	Weld fittings				X			
Stainless Steel	Fitting body					X		
	Nuts up to 12-L/10-S						X	
	Nuts from 15-L/12-S							X
	Progressive ring			X				
	EO-2 Functional nuts upto 12-L/10-S						X	
	EO-2 Functional nuts from 15-L/12-S							X
	Weld fittings					X		
Brass	Fitting body							
	Nuts					X		
	Cutting ring							

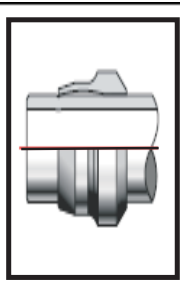
A3C / A3D - ACCORDING TO DIN / ISO 4042

Znphr5f - ACCORDING TO DIN /EN/ISO 3892 and DIN 50942

**OVER BITING OF FERRULE**

Too much pressure or more than 1-3/4 turns from finger tight were used to pre-set FERRULE, or the nut was severely over-tightened in the final assembly.

This assembly should be scrapped

**NO BITING ON TUBES**

If all of the prior checks have been made and the FERRULE still shows no sign of biting on the tube it may be that the tube is too hard or the FERRULE is not hardened properly. this assembly should be scrapped.

If you find improper Biting on FERRULE on tubes then please check the below:-

**TUBE NOT BOTTOMED**

Check the indentation of the tube end or compare the length from the end of the tube to the front end of the FERRULE of a known good assembly to that of the assembly in question. This assembly should be scrapped.

**SHALLOW BITING**

Inspect the turned up ridge of the material, a failure to achieve this ridge can be traced either to the nut not being tightened enough or the tube not being bottomed against the travel forward with allowed the tube to travel forward with the FERRULE.

In some instances this assembly must be re-worked

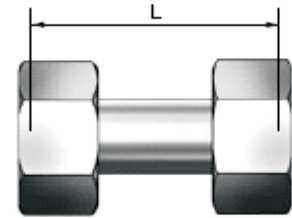
**Assembly in fitting body**

The use of pre-assembly bodies or pre-assembly tools are strongly recommended for all assemblies. Stainless steel tube and fittings as well as standpipe hose ends must be pre-assembled in a pre-assembly tool.

**A) Preparing the tube** ①

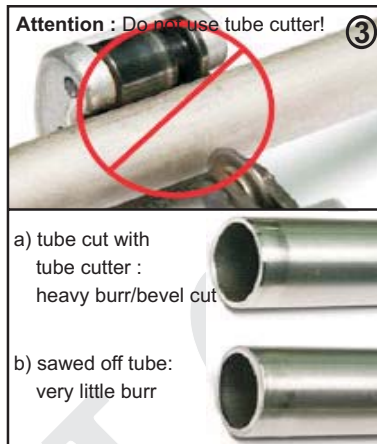
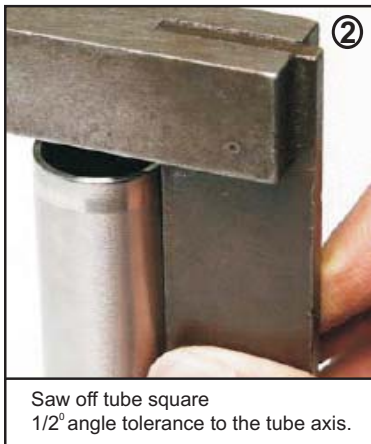
Maximum Height H for straight tube end

Minimum length L for short piece of tube



The portion of straight tube H must not deviate from roundness and straightness to the extent that the tube tolerances in DIN 2391 are exceeded.

Series tube o.d.	LL				L										S									
	4	5	6	8	6	8	10	12	15	18	22	28	35	42	6	8	10	12	14	16	20	25	30	38
H min	24	25	25	26	31	31	33	33	36	38	41	41	48	48	35	35	37	37	43	43	50	54	58	65
L min	30	32	32	33	39	39	42	42	45	48	53	53	60	60	44	44	47	47	54	54	63	68	73	82



**B) Preparing fittings parts with lubricants**





Assembly in fitting body

C) Components ⑥



Slip nut and progressive ring over tube end.

correct ⑦

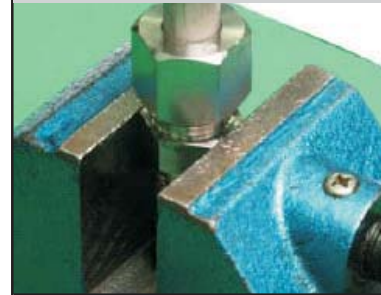


incorrect

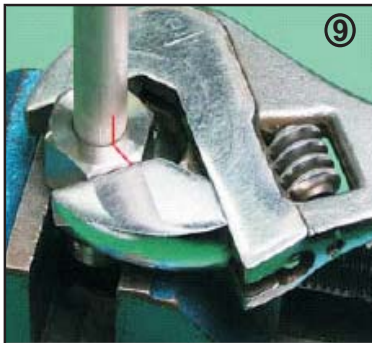


Ensure progressive ring and nut are facing the right way.

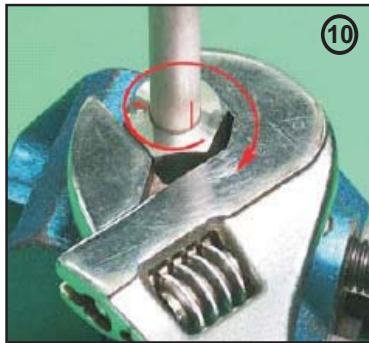
D) Assembly ⑧



Screw nut manually on to fitting body until finger tight. Hold tube against the shoulder in the cone of fitting body.



To measure the prescribed turns of the nut, mark nut and tube.



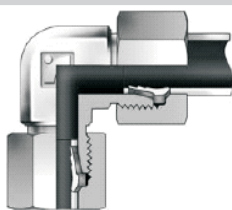
Tighten nut 1-1/2 turns (Tube must not turn with nut). Stops edges limits over tightening by increasing tightening torque.

E) Check ⑪



Loosen nut. Remove tube from fitting and check if a visible collar fills space in front of 1st cutting edge completely. If not, tighten slightly more. If dose not matter if ring can be rotated on tube end.

F) Final Assembly ⑫



Final assembly of all pre-assembled fittings (DSE, DSBT, DSRT, DSRA) made in the appropriate body (well lubricated) with at least 1/4 turn of the nut beyond the point of clearly perceptible resistance.

G) Repeated assembly ⑬



On remaking joints, nut to be tightened without increased effort. Fitting body to be held tight

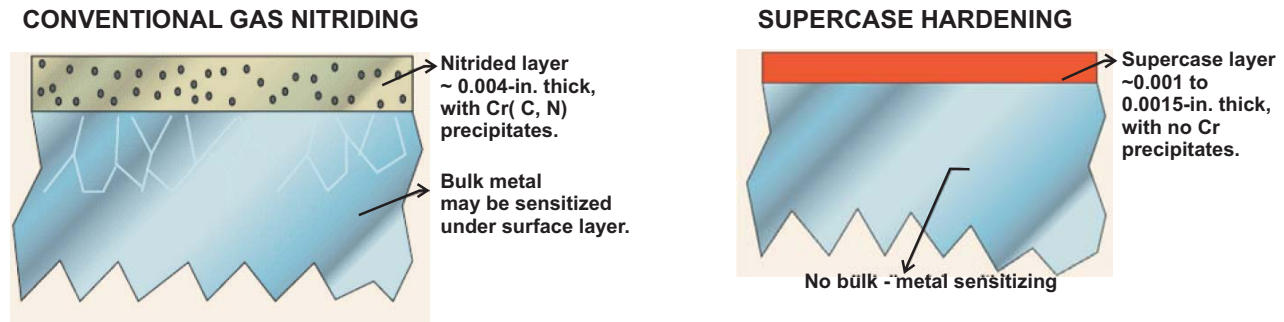
\* After dismantling the tube ends for inspection they should be refitted into the same inner cone of the fitting body in which assembly was carried out.



**WARNING**

We warn against using sealing heads, form A, DIN 3868.

We recommend the use of swivel nuts, from B in conformance with DIN 3865



Conventional nitriding and carburizing requires high temperatures that can sensitize Steel and Stainless Steel and make it susceptible to corrosion.

The Super case Hardening Process keeps Chromium in solid solution for corrosion resistance & does not affect the bulk metal

### Design Evolution of Ferrules hardening

Ferrules should be originally machined from Cold-drawn stainless steel bar stock. cold drawing strain hardens the metal and imparts mechanical strength throughout the ferrule. But the ferrule's front edge was often still not hard enough to seal against tube surface defects such as scratches, weld seams, ovality and hardness variations, where as the core hardness was too high to deform properly.

One solution was to plate ferrules with a soft metal ( such as silver ) for a better seal when dealing with high pressure gas. This improved resistance to impulse pressures, temp. swings and vibration.

Many ultra high vacuum and high -pressure seals deform hard edges in to soft metal gaskets. Deforming the soft components with a hard one provides intimate metal to metal contact over the contact surfaces and overcome surface irregularities.

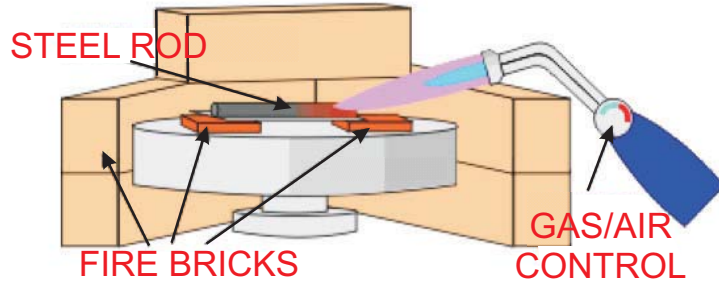
We as manufacturer applied this concept to tube fittings by case hardening ferrules, which substantially increase surface hardness and lets them shear through surface defects and compensate for tubing variations.

Conventional Gas Hardening case hardens the inner surface to a depth of approx. 0.10 to 0.30mm. During assembly, the ferrule front edge shears n to the tube, If disassembled, the ferrule remains tightly locked to the tubing, allowing remakes with consistent sealing integrity. The fitting handles internal pressures, impulse pressures, temp. changes and vibrations until the tubing fractures or fails in fatigue.

Case hardening is a simple method of hardening steel. It is less complex than hardening and tempering. this techniques is used for steels with a low carbon content. Carbon is added to the outer surface of the steel, to the depth of approximately 0.03mm. One advantage of this method of hardening steel is that the inner core is left untouched and so steel processes properties such as flexibility and is still relatively soft .

**STAGE ONE:**

The steel is heated to red heat. It may be only to necessary to harden one part of the steel and so heat can be concentrated in this area.



**STAGE TWO:**

The steel is removed from the brazing hearth with blacksmiths tongs and plunged into case hardening compound and allowed to cool a little. The case hardening compound is high in carbon.



**STAGE THREE:**

The steel is heated again to a red colour, removed from the brazing hearth and plunged into cold, clean water.

The steel rod should now have a hardened outer surface and a flexible, soft interior. The process can be repeated to increase the depth of the hardened surface.



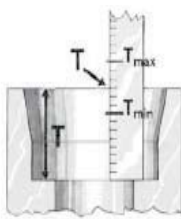
- acc. to ISO 9974-1 / ISO 6149-1 / DIN 3852-T1 from X / DIN 3852-T3-from W
- Metric ISO thread M

			MA/Nm								
Series	Tube O.D.	Thread G	Straight male stud fittings with port tapping				Non-return valves RHV / RHZ Form E with ED-sealing	Benjo fittings		Blanking plugs	
			Form A for sealing washer	Form B with face	Form E with ED-sealing	Form F with O-Ring-sealing		WH / TH	SWVE	VSTI-ED Form E with ED-sealing	VSTI-OR Form F with O-Ring sealing
L	6	M10 x 1.0	9	18	18	15	18	18	18	12	20
	8	M12 x 1.5	20	30	30	25	25	45	35	25	
	10	M14 x 1.5	35	45	45	35	35	55	50	35	
	12	M16 x 1.5	45	55	55	40	50	80	60	55	
	15	M18 x 1.5	55	80	70	45	70	100	80	65	
	18	M22 x 1.5	65	140	125	60	125	140	120	90	
	22	M27 x 2.0	90	190	180	100	145	320	130	135	
	28	M33 x 2.0	150	340	310	160	210	360		225	
	35	M42 x 2.0	240	500	450	210	360	540		360	
S	42	M48 x 2.0	290	630	540	260	540	700		360	
	6	M12 x 1.5	20	35	35	35	35	45	35		35
	8	M14 x 1.5	35	55	55	45	45	55	50		45
	10	M16 x 1.5	45	70	70	55	55	80	60		55
	12	M18 x 1.5	55	110	90	70	70	100	80		70
	14	M20 x 1.5	55	150	125	80	100	125	110	80	80
	16	M22 x 1.5	65	170	135	100	125	135	120		100
	20	M27 x 2.0	90	270	180	170	135	320	135		170
	25	M33 x 2.0	150	410	310	310	210	360			310
	30	M42 x 2.0	240	540	450	330	360	540			330
38	M48 x 2.0	290	700	540	420	540	700			420	

Tolerance of tightening torques listed in above table: + 10%

Note: Lubricate stud with hydraulic oil before screwing in! Tightening torques relate to counterpart made of steel.

**Check List for " Inside Depth" for DIN 2353 Fittings**



Type	T <sub>min</sub>	T <sub>max</sub>		Type	T <sub>min</sub>	T <sub>max</sub>
6-L	6.95	7.05		6-S	6.95	7.05
8-L	6.95	7.05		8-S	6.95	7.05
10-L	6.95	7.05		10-S	7.45	7.55
12-L	6.95	7.05		12-S	7.45	7.55
15-L	6.95	7.05		14-S	7.95	8.05
18-L	7.45	7.55		16-S	8.45	8.55
22-L	7.45	7.55		20-S	10.45	10.55
28-L	7.45	7.55		25-S	11.95	12.05
35-L	10.45	10.55		30-S	13.45	13.55
42-L	10.95	11.05		38-S	15.95	16.05

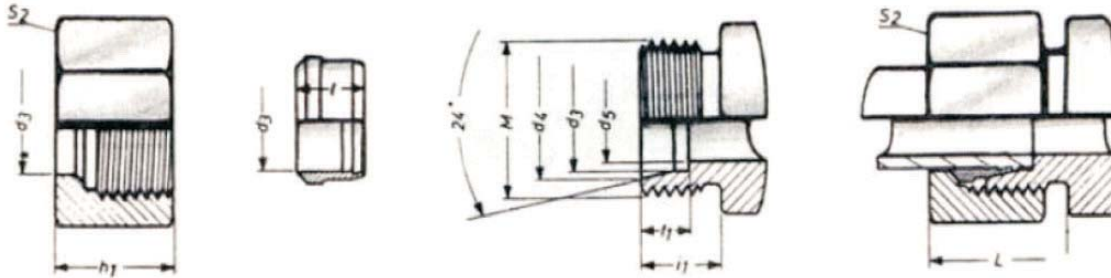


- acc. to ISO 1179-1/DIN 3852-T2-form X
- BSPP thread G

			MA/Nm						
			Straight male stud fittings with port tapping			Non-return valves RHV / RHZ Form E with ED-sealing	Benjo fittings		Blanking plugs VSTI-ED Form E with ED-sealing
Series	Tube O.D.	Thread G	Form A for sealing washer	Form B with cutting face	Form E with ED-sealing		WH / TH	SWVE	
L	6	G 1/8 A	9	18	18	18	18	18	13
	8	G 1/4 A	35	35	35	35	45	40	30
	10	G 1/4 A	35	35	35	35	45	40	
	12	G 3/8 A	45	70	70	50	70	65	60
	15	G 1/2 A	65	140	90	85	120	90	80
	18	G 1/2 A	65	100	90	65	120	90	
	22	G 3/4 A	90	180	180	140	230	125	140
	28	G 1 A	150	330	310	190	320		200
	35	G 1 1/4 A	240	540	450	360	540		450
	42	G 1 1/2 A	290	630	540	540	700		450
S	6	G 1/4 A	35	55	55	45	45	40	
	8	G 1/4 A	35	55	55	45	45	40	
	10	G 3/8 A	45	90	80	60	70	65	
	12	G 3/8 A	45	90	80	60	70	65	
	14	G 1/2 A	65	150	115	145	120	90	
	16	G 1/2 A	65	130	115	100	120	90	
	20	G 3/4 A	90	270	180	145	230	125	
	25	G 1 A	150	340	310	260	320		
	30	G 1 1/4 A	240	540	450	360	540		
	38	G 1 1/2 A	290	700	540	540	700		

Tolerance of tightening torques listed in above table: + 10%

Note: Lubricate stud with hydraulic oil before screwing in! Tightening torques relate to counterpart made of steel.



PART NO.		Tube DN		M	Series	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	t <sub>1</sub>	i <sub>1</sub>	S <sub>2</sub>	h <sub>1</sub>	l	L
FERRULE	NUT	o. d. size	o. d. size											
F 4-LL	N 4-LL	4	3	-	M 8x1	4	5	3	4	8	10	11.5	6	14
F 6-LL	N 6-LL	6	4	-	M 10x1	6	7.5	4.5	5.5	8	12	12	7	14
F 8-LL	N 8-LL	8	6	1/8	M 12x1	8	9.5	6	5.5	9	14	12.5	7	15
F 10-LL	N 10-LL	10	8	1/4	M 14x1	10	11.5	8	5.5	9	17	12.5	7	15
F 12-LL	N 12-LL	12	10	3/8	M 16x1	12	13.5	10	6	9	19	13	7.5	15
F 6-L	N 6-L	6	4	-	M 12x1.5	6	8.1	4	7	10	14	15	9.5	18
F 8-L	N 8-L	8	6	1/8	M 14x1.5	8	10.1	6	7	10	17	15	9.5	18
F 10-L	N 10-L	10	8	1/4	M 16x1.5	10	12.3	8	7	11	19	16	10.5	19
F 12-L	N 12-L	12	10	3/8	M 18x1.5	12	14.3	10	7	11	22	16	10.5	19
F 15-L	N 15-L	15	12	1/2	M 22x1.5	15	17.3	12	7	12	27	17.5	10.5	20
F 18-L	N 18-L	18	16	1/2	M 26x1.5	18	20.3	15	7.5	12	32	18	10.5	21
F 22-L	N 22-L	22	20	3/4	M 30x2	22	24.3	19	7.5	14	36	20.5	12	23
F 28-L	N 28-L	28	25	1	M 36x2	28	30.3	24	7.5	14	41	21	11	23
F 35-L	N 35-L	35	32	1 1/4	M 45x2	35	38	30	10.5	16	50	24	14	27
F 42-L	N 42-L	42	42	1 1/2	M 52x2	42	45	36	11	16	60	24	14	28
F 6-S	N 6-S	6	3	-	M 14x1.5	6	8.1	4	7	12	17	16	9.5	20
F 8-S	N 8-S	8	4	-	M 16x1.5	8	10.1	5	7	12	19	16	9.5	20
F 10-S	N 10-S	10	6	1/8	M 18x1.5	10	12.3	7	7.5	12	22	17.5	10.5	21
F 12-S	N 12-S	12	8	1/4	M 20x1.5	12	14.3	8	7.5	12	24	18	10.5	21
F 14-S	N 14-S	14	10	3/8	M 22x1.5	14	16.3	10	8	14	27	20	10	24
F 16-S	N 16-S	16	12	1/2	M 24x1.5	16	18.3	12	8.5	14	30	21	10.5	24
F 20-S	N 20-S	20	16	1/2	M 30x2	20	22.9	16	10.5	16	36	24	13	27
F 25-S	N 25-S	25	20	3/4	M 36x2	25	27.9	20	12	18	46	26.5	13.5	30
F 30-S	N 30-S	30	25	1/	M 42x2	30	33	25	13.5	20	50	29.5	13.5	33
F 38-S	N 38-S	38	32	1 1/4	M 52x2	38	41	32	16	22	60	32.5	13.5	37

Dimensions given are approx. figures with tightened nut  
No. Fig. of cutting/locking ring

**NB.: INCH O.D. AND NOMINAL BORE OD. FITTINGS ARE ALSO AVAILABLE  
ASK FOR DRG AND PRICES SEPARATELY.**

# VISUAL INDEX - DIN 2353 FITTINGS

## Tube Fittings Accessories



Nut-N



Ferrule-F



Soft sealing Ring-DAZ



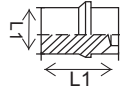
Weld Nipple



Support Sleeve



Closure plug



Blanking plug



Vsti plug



Hex plug



Check Nut

## Tube to Tube - Fittings



Equal Union - G



Equal Elbow - W



Equal Tee - T



Equal Cross - K



Bulkhead Union - SV



Bulkhead Elbow - WSV



Unequal Union - GR



Unequal Tee - TR

## Tube to Swivel - Fittings



Swivel Elbow - EVW



Swivel Branch Tee - EVT



Swivel Run Tee - EVL



Tube End Reducer - RED



Tube End Reducer - KOR



Distance Piece Adaptor



Wire Swivel Elbow - EW



Wire Swivel Branch Tee



Wire Swivel Run Tee - EL

## Swivel to Swivel - Fittings



Swivel Equal Union



Swivel Reducer

# VISUAL INDEX - DIN 2353 FITTINGS

## Male Stud Connector - Fittings



GEO



GE - R



GE - R - ED



GE - R - KED



GE - M



GE - M - ED



GE - — KEG



GE - UNF/UN



GE - NPT



EVGE - R



EGE - O



EGE - M - ED



EGE - R - ED



EVGE - R - ED



EVGE - NPT

## Lock Nut Adjustable - Fittings



WEE - OR



WEE - M



WEE - R



WEE - UNF



TEE - OR



TEE - M



TEE - R



LEE - R



LEE - M



LEE - UNF

## Banjo Elbow & Tee - Fittings



WH-R-KDS-O RING



WH-M-KDS-O RING



SWVE-R



SWVE-M



KDSWVE-R



KDSWVE-M



TH-R-KDS



TH-M-KDS



TH-R



TH-M



## VISUAL INDEX - DIN 2353 FITTINGS

### Non Adjustable - Fittings



WE-NPT



WE-M-KEG



WE-M



WE-R



WE-R-KEG



TE-M



TE-R



TE-R-KEG



LE-M



LE-R

### Tube to Female - Fittings



GAI-R



GAI-M



GAI-BSPT



GAI-NPT



GAI-UNF

### Port Reducers - Fittings



RI-ED



RI

### Gauge Adaptor - Fittings



MAV



MAVF

### Blanking Plugs - Fittings



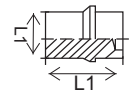
ROV



VSTI-R



VKA



BUZ



Hex Plug

### Weld fittings - Fittings



Weld adaptor -AS



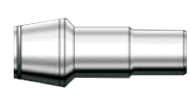
Weld elbow- WAS



Bulkhead Weld coupling



Weld Nipple



Reducing WNO