

# General Information

## Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

### Product Categories

5.1 Pipe Fittings	5-4
5.2 Fittings	5-12
5.3 Pipe Repair Clamps	5-15

## 5.1 Pipe Fittings



# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings

Flange adapters, pipe fittings, special pipe fittings, restraint joints

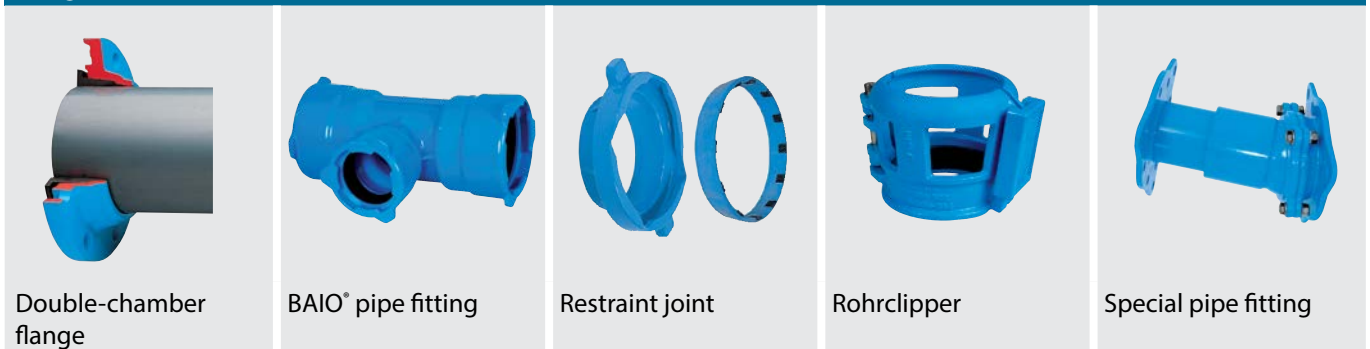
The so-called „Spar flanges“ (flange adapters) as well as the double-chamber flanges developed later were the first products designed by Hawle back in 1948.

This flange programme has been continuously broadened over the years. Today, a multitude of double-chamber flanges are available for connecting the most different pipe materials and pipe outside diameters. The double-chamber flanges are available as restraint and non-restraint versions.

Moreover, the Hawle range of pipe fittings includes the systems BAIO® (see Section 1 Threadless Connection Technology), „System 2000“ and „Synoflex“.

This product range also includes special pipe fittings, the range of restraint joints for screw sockets, and the „Rohrclipper“ tension lock for establishing restraint connections of PVC pipes.

### Design variants



Double-chamber flange

BAIO® pipe fitting

Restraint joint

Rohrclipper

Special pipe fitting

### Possible connections

#### BAIO® system

The form-locked connection of fittings in the BAIO® system is established via a bayonet connection requiring only little force. This enables the time-saving connection of pipe fittings and valves without the need of threaded connections. Apart from the connection via the BAIO® systems, transitions to other systems such as the ZAK® system or the Synoflex system are also available.



Medium (depending on the component): potable water, sewage water, gas

For more information on the Hawle BAIO® system please refer to Section 1 Threadless Connection Technology.

#### Synoflex system

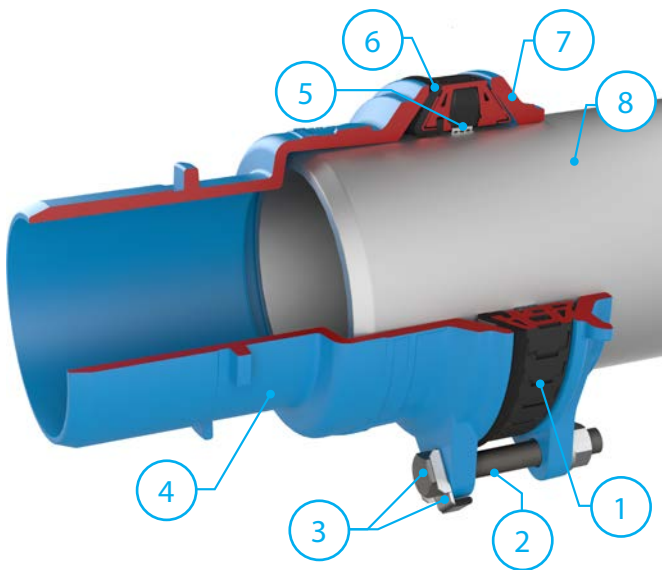
HAWLE SYNOFLEX is suitable for the restraint connection of all types of pipes customary in the water industries. By means of this patented system, various pipes (steel, CI, PE, PVC, AC) can be connected while ensuring corrosion protection. By simply pinching the quick-clamping lugs, the SYNOFLEX ring can be easily adapted to the pipe. Additionally, the SYNOFLEX socket allows for up to 4° angle compensation along the pipe axis.



Medium: potable water, sewage water

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings



1. Synoflex ring
2. Bolts (INOX)
3. Bolt head locking ring
4. Body
5. Grip ring of steel
6. Gasket
7. Lock ring
8. Steel pipe

When connecting PE pipes, a support liner (Ord. No. 590) must be used.

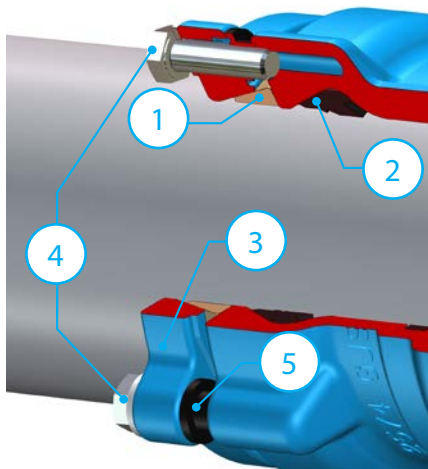
### System 2000

“System 2000” is suitable for PE and PVC pipes. When used with PE pipes, “System 2000” is an easy-to-install and economical alternative to welding.

By pushing the plastic pipe into the “System 2000” socket and tightening the lock ring, a tight and restraint joint withstanding pressures up to 16 bar can be established.

For thin-walled PE pipes (up to 3mm wall thickness) as well as for low-pressure pipelines, the use of a support support liner is mandatory.

Medium: potable water, sewage water



1. Grip ring
2. Lip seal
3. Lock ring
4. Hexagon head screw
5. Spacer sleeve

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

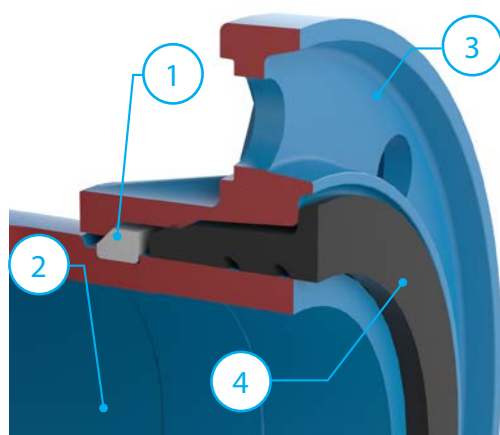
## 5.1 Pipe Fittings

### Fixed flange

The drill pattern of the flange faces is manufactured acc. to DIN EN 1092-2. In plant engineering, the flange connection is the most common method to connect valves and pipe fittings with each other. In buried installation, however, alternative connections are increasingly preferred as they are better able to meet the higher requirements on buried valves and pipe fittings.



Medium (depending on the component): potable water, sewage water, gas



### Loose flange system


Apart from the fixed flanges, there is the system with restraint loose flanges. The dismantling piece is particularly suitable for exchanging existing pipe fittings. The flat gasket (barrel gasket) is already included in the loose flange. Therefore, no keying is required between the flanges.

Medium: potable water, sewage water



1. Retaining ring

4. Barrel gasket with lip seal

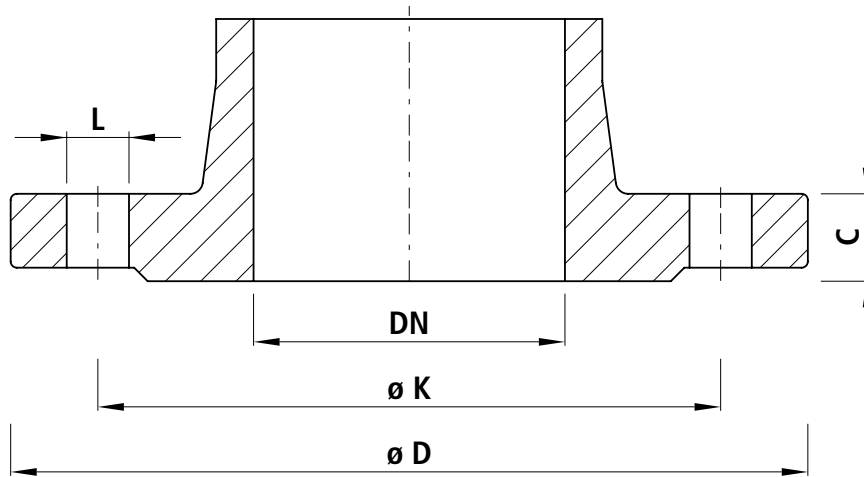
Double-chamber flange	Ord. No.	For type of pipe
	710	CI pipes
	713	Steel pipes
	716	AC pipes
	560	PVC pipes
	550	PE-/PVC pipes (restraint)
	760	CI pipes (restraint)
	7601	Steel pipes (restraint)

Required screw lengths for the connection between the fixed flange and the flanged fitting									
Fixed flange DN	Screw dimension		Number of screws		Screw length in mm for Ord. No.				
	PN 10	PN 16	PN 10	PN 16	710/713/716	550	560	760	7601
50	M 16	M 16	4	4	70	60	70	90	80
65	M 16	M 16	4	4	70	70	70	100	80
80	M 16	M 16	8	8	70	70	70	100	80
100	M 16	M 16	8	8	70	70	70	100	80
125	M 16	M 16	8	8	80	70	80	100	80
150	M 20	M 20	8	8	80	70	80	140	100
200	M 20	M 20	8	12	80	-	80	140	100
250	M 20	M 24	12	12	90	-	90	140	-
300	M 20	M 24	12	12	90	-	90	140	-
350	M 20	M 24	16	16	-	-	-	-	-

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings

Flange acc. to EN 1092-2



DN Inch		32 1¼"	40 1½"	50 2"	65 2½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"	350 14"	400 16"	450 18"	500 20"	600 24"	
PN 10	D	140	150	165	185	200	220	250	285	340	395	445	505	565	615	670	780	
	K	100	110	125	145	160	180	210	240	295	350	400	460	515	565	620	725	
	n	4	4	4	4	8	8	8	8	8	12	12	16	16	20	20	20	
	L	18	18	18	18	18	18	18	18	22	22	22	22	22	26	26	26	30
	C	18	19	19	19	19	19	19	19	19	20	22	24.5	24.5	24.5	25.5	26.5	30
PN 16	D	140	150	165	185	200	220	250	285	360	405	460	520	580	640	715	840	
	K	100	110	125	145	160	180	210	240	295	355	410	470	525	585	650	770	
	n	4	4	4	4	8	8	8	8	12	12	12	16	16	20	20	20	
	L	18	18	18	18	18	18	18	18	22	22	26	26	26	30	30	33	36
	C	18	19	19	19	19	19	19	19	19	20	22	24.5	26.5	28	30	31.5	36
PN 25	D	140	150	165	185	200	235	270	300	360	425	485	555	620	670	730	845	
	K	100	110	125	145	160	190	220	250	310	370	430	490	550	600	660	770	
	n	4	4	4	8	8	8	8	8	12	12	16	16	16	20	20	20	
	L	18	18	18	18	18	22	26	26	26	30	30	33	36	36	36	36	39
	C	18	19	19	19	19	19	19	19	20	22	24.5	27.5	30	32	34.5	36.5	42

n = numer of bores

Mating dimensions acc. to DIN EN 1092-2

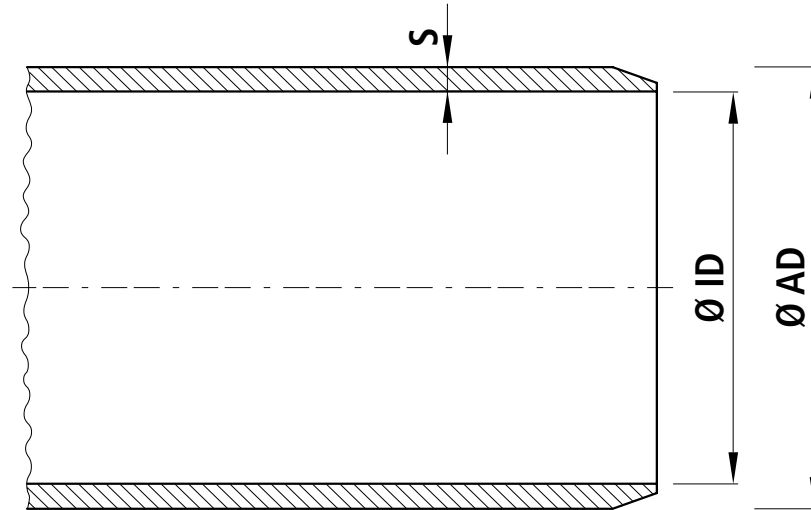
- for flange types GG 05; 21 (PN 6)

- for flange types DG 05; 11; 12; 14 and 21 (PN 10 - PN 40)

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings

PE pipes acc. to DIN EN 12201, DIN 8074



Ø AD mm	SDR 17 (S8) PE 80 = PN 8 PE 100 = PN 10			SDR 11 (S5) PE 80 = PN 12.5 PE 100 = PN 16		
	s mm	Ø ID mm	[l] *	s mm	Ø ID mm	[l] *
d 32	1.9	28.2	625	2.9	26.2	539
d 40	2.4	35.2	973	3.7	32.4	824
d 50	3.0	44.0	1521	4.6	40.8	1307
d 63	3.8	55.4	2411	5.8	51.4	2075
d 75	4.5	66.0	3421	6.8	61.4	2961
d 90	5.4	79.2	4927	8.2	73.6	4254
d 110	6.6	96.8	7359	10.0	90.0	6362
d 125	7.4	110.2	9538	11.4	102.2	8203
d 140	8.3	123.4	11960	12.7	114.6	10315
d 160	9.5	141.0	15615	14.6	130.8	13437
d 180	10.7	158.6	19756	16.4	147.2	17018
d 200	11.9	176.2	24384	18.2	163.6	21021
d 225	13.4	198.2	30853	20.5	184.0	26590
d 250	14.8	220.4	38152	22.7	204.6	32878
d 280	16.6	246.8	47839	25.4	229.2	41259
d 315	18.7	277.6	60524	28.6	257.8	52198
d 355	21.1	312.8	76846	32.3	290.4	66234
d 400	23.7	352.6	97646	36.4	327.2	84085

\* Pipe volumes each km pipe length

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings

General pipe dimension table for supply lines

DN	INCH	Cl pipe screw socket old AD/mm	Cl pipe SRM pipe DIN 28601 AD/mm	Cl pipe SRM pipe Von Roll AD/mm	Cl pipe push-fit sockets DIN EN 545 AD/mm	Cl pipe with PE cover AD/mm	Push-fit sockets fiber cement/mortar coated AD/mm	Steel pipe AD/mm	Steel pipe DIN EN 10297-1 AD/mm	PE pressure pipe DIN EN 12201, DIN 8074 AD/mm	Eternit pipe ND 10/18 AD/mm	Eternit pipe ND 16/24 AD/mm
15	½"		25					21-21,5	21,3±0.5	20+0.3		
20	¾"		33					26-27	26,9±0.5	25+0.3		
25	1"		39					33-34	33,7±0.5	32+0.3		
32	1¼"	42-43	46					42-43	42,4±0.5	40+0.4		
40	1½"	51-53	56 +2.1/-2.6	52 +2/-1	56 +1/-1.2			46-49	48,3±0.5	50+0.5		
50	2"	62-64	66	63 +2/-1	66 +1/-1.2			56-61	60,3±0.6	63+0.6		
60		72-74	77					70-71				
65	2½"		82		82 +1/-1.2			72-76	76,1±0.8	75+0.7		
70		83-85	87	84 +2/-1				77-79				
75	3"	88-91						82-84				
80		94-96	98 +2.2/-2.7	95 +2/-1	98 +1/-2.7		108	88-89	88,9±0.9	90+0.9		104
90		104-108	108					97-102				
100	4"	114-116	118+2.2/-2.8	116 +2/-1	118+1/-2.8	121.6+2.2/-2.8	128	107-109	108,0±1.1 114,3±1.1	110+1.0 125+1.2		128
110		123-125										
120		134-137										
125	5"	140-143	144+2.3/-2.8	141 +2/-1	144+1/-2.8	148+2.3/-2.8	154	132-134	133,0±1.3 139,7±1.4	140+1.3		157
135		150-153										
150	6"	166-169	170 +2.3/-2.9	168 +2/-1	170+1/-2.9	174+2.3/-2.9	180	157-160	159,0±1.6 168,3±1.7	160+1.5 180+1.7		186
165		180-184										
175		191-194	196					183-191				
180		198-200										
190		208-211										
200	8"	218-222	222+2.4/-3.0	220 +2/-1	222+1/-3.0	226+2.4/-3.0	232	211-216	200,0+2.0 219,1±2.2	200+1.8 225+2.1	236	244
225		244-247	248					241		250+2.3		
250	10"	268-273	274 +2.5/-3.1	273 +2.5/-1.5	274+1/-3.1		284	267	267,0±2.7 273,0±2.7	280+2.6	292	304
275		297-300	300					292				
300	12"	322-325	326+2.6/-3.3	324 +2.5/-1.5	326+1/-3.3	330.4+2.6/-3.3	336	316	323,9±3.2	315+2.9 355+3.2	350	364



# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.1 Pipe Fittings

DN	INCH	Cl pipe screw socket old AD/mm	Cl pipe SRM pipe DIN 28601 AD/mm	Cl pipe SRM pipe Von Roll AD/mm	Cl pipe push-fit sockets DIN EN 545 AD/mm	Cl pipe with PE cover AD/mm	Push-fit sockets fiber cement/cement-mortar coated AD/mm	Steel pipe AD/mm	Steel pipe DIN EN 10297-1 AD/mm	PE pressure pipe DIN EN 12201, DIN 8074 AD/mm	Eternit pipe ND 10/18 AD/mm	Eternit pipe ND 16/24 AD/mm
315			341									
325		348-352	352					343				
350	14"	376-379	378 +2.7/-3.4	376 +2.5/-1.5	378 +1/-3.4		388	368	355,6±3.6 368,0±3.7	355 +3.2 400 +3.6	410	426
375			403					394				
400	16"	426-430	429+2.8/ -3.5	427 +2.5/-1.5	429 +1/-3.5	433.4 +2.8/ -3.5	439	419	406.4±4.1 419.0±4.2	400 +3.6 450 +3.8	468	488
450	18"				480 +1/-3.5							
500	20"				532 +1/-3.8				508.0±5.1			

## 5.2 Fittings



# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.2 Fittings

Hawle push-fit fittings have been on the market for more than 50 years. The proven Hawle push-fit connection technology ensures an optimum seating of the pipe in the fitting. A grip ring and an O-ring ensure a connection both restraint and leak-tight.

The preloaded, large-volume O-ring of highly elastic rubber provides for sealing even off-round pipes (also in case of negative pressure). The grip ring holds the plastic pipe in a restraint connection, ensuring, via a regular distribution of the retaining forces, that no notch stress is transferred to the pipe. As a consequence of the pipe being pressed out due to inside pressure, the grip ring is pulled into the conical chamber, which increases the tensile strength of the connection (proportional action sealing and restraint system).

The connection is elastic; the fitting can be dismantled again if required. For PE pipes PE 80 / PE 100 and PE-X pipes the fitting is provided with an interlocked grip ring, for PVC pipes with corundum grip ring. The push-fit fittings are made of Hawle epoxy powder coated GJL- 250/GJS-400, or alternatively of POM.

Numerous corrosion examples from practice have shown that it is not advisable to permit various metals to get in contact. This is the case, for example, when brass is connected with cast iron (tapping sleeves). Because of the electrochemical series, this may lead to bimetal corrosion of the baser material (DIN EN 12502: „European information standard on the corrosion protection of metal materials“). Therefore, since 1998, the extensive fitting range has been expanded by the ZAK® connection system and can now be used without any thread and completely protected against corrosion. For more information on the ZAK® system please refer to Section 1.

### Hawle push-fit fittings

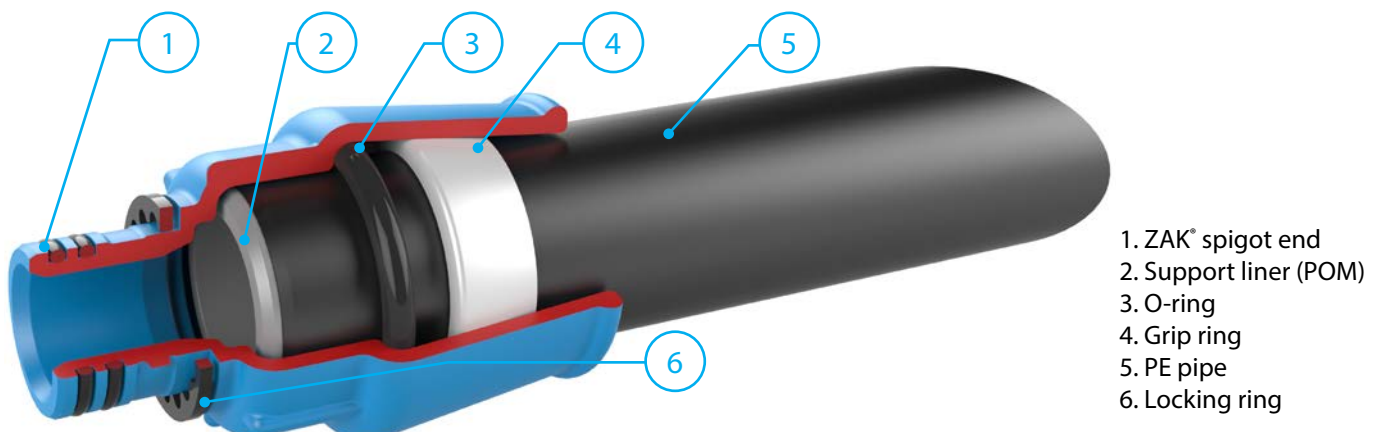
#### Technical features

- For pipes of PE 80, PE 100, PE-X (version with interlocked grip ring - standard)
- For pipes of PVC (version with corundum grip ring - on request)
- Easy installation / dismantling
- Proportional action sealing and restraint system
- When PE pipes are connected, support liners are to be used



#### Technical data

Body:	cast iron: GJL-250 / GJS-400, Hawle-Epoxy-Pulverbeschichtung plastic: POM
Tested acc. to	DIN 8076
Max. operating pressure:	16 bar



Note: The push-fit fittings for service lines (d25 to d63) come with the support liner (POM) supplied by the factory. The number of support liners added depends on the number of push-fit connections.

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.2 Fittings

### Design variants



Push-fit fitting with ZAK® spigot end (Ord. No. 616-00)



Push-fit fitting with male thread (Ord. No. 610-00)



Push-fit fitting with female thread (Ord. No. 620-00)



Connector with push-fit fitting on both ends (Ord. No. 630-06)



Rotating electrofusion elbow 90° with cylindrical male thread (Ord. No. 646-07)

### Versions

ZAK® connection (for detailed information see Section 1 Threadless Connection Technology):

- No thread and no hemp
- Manual mounting forces will be sufficient (no tool required)
- Integral corrosion protection

Cylindrical male thread with double O-ring

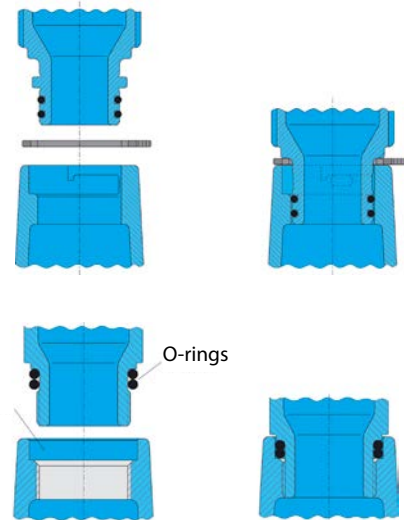
- No hemp sealing due to use of sealing surface at Hawle pipe saddles (type "D")
- Manual mounting forces will be sufficient (no tool required)

Tapered male thread:

- Connection with customary female thread (use of hemp or Teflon tape)

Female thread

- Connection with customary tapered male thread (use of hemp or Teflon tape)



## 5.3 Pipe Repair Clamps



# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.3 Pipe Repair Clamps

HAWLE pipe repair clamps can be used to repair damaged potable water, sewage water, and gas pipes. Other media on request!

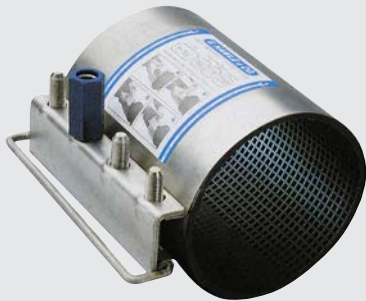
Please specify use for gas applications on ordering!

### Pipe repair clamps of stainless steel

Hawle pipe repair clamps of stainless steel for CI, steel, AC, and PVC pipes are characterized by some user-friendly details. When using the supplied nut dispensers, no nuts will get lost during installation. The central pin is designed longer to permit a first fixing of the clamp. The handle facilitates installation. The clamps can be mounted by one single person.

Problems of corrosion are largely excluded due to the choice of materials.

### Design variants



Pipe repair clamp „single lug“, Ord. No. 110-00



Pipe repair clamp „multiple lug“, Ord. No. 120-00

Pipe repair clamps of stainless steel, Ord. No. 110-00/120-00

### Technical features

- Pipe repair clamp „single lug“:  
Pipe outside diameter 54 - 430 mm, standard lengths from 200 - 380 mm
- Pipe repair clamp „multiple lug“:  
Pipe outside diameter 87 - 471 mm, standard lengths from 200 - 380 mm
- Special versions for larger nominal widths or different lengths on request
- PLEASE NOTE: Pipe repair clamps are not suitable for establishing restraint connections!

### Technical data

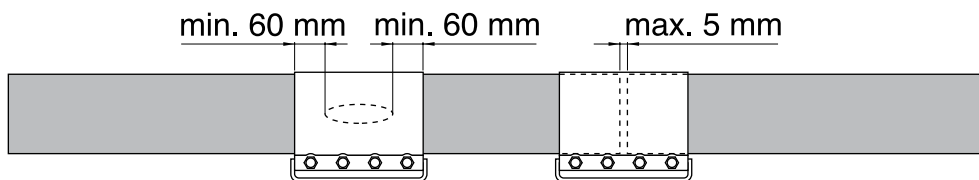
Body:	stainless steel
Bolts/nuts:	stainless steel
Media:	potable water, sewage, gas (on request)
Gasket:	EPDM acc. to DVGW W 270 for water and/or NBR for gas
Max. operating pressure:	pipe repair clamp „single lug“:  potable water / sewage: d 54 - d 190: 16 bar d 190 - d 430: 10 bar  gas: d 54 - d 430: 5 bar (on request)

# General Information - Pipe Fittings, Fittings, Flanges, Restraint Joints, Pipe Repair Clamps

## 5.3 Pipe Repair Clamps

Max. operating pressure:	pipe repair clamp „multiple lug“  potable water / sewage: d 87 - d 186: 16 bar d 208 - d 430: 10 bar d 430 - d 471: 6 bar  gas: d 87 - d 471: 5 bar (on request)
Max. bolt tightening torque:	pipe repair clamp „single lug“ d 54 - d 130 = max. 60 Nm d 131 - d 430 = max. 90 Nm  pipe repair clamp „multiple lug“ d 87 - d 132 = max. 60 Nm d 132 - d 471 = max. 90 Nm

The range of application for damaged spots has to be observed:



### Pipe repair clamps for PE and PVC pipes, Ord. No. 510-00

HAWLE pipe repair clamps for PE and PVC pipes consist of two metal saddle halves with Hawle epoxy powder coating for corrosion protection and rubber liners. The saddle halves are connected via four bolts.

The saddle halves shall be installed by tightening the bolts all the way to the stop at the torques specified in the respective operating instructions, depending on the pipe outside diameter.



### Technical data

Half shell:	GJS-400
Corrosion protection:	Hawle epoxy powder coating
Bolts/nuts:	stainless steel
Media:	potable water, sewage, gas (on request)
Gaskets:	standard EPDM (water), NBR (gas) - on request
Max. operating pressure:	potable water / sewage: 16 bar gas: 5 bar - PVC pipes only (on request)
Width of saddle half:	120 mm
Outside diameter:	d 75 - d 280