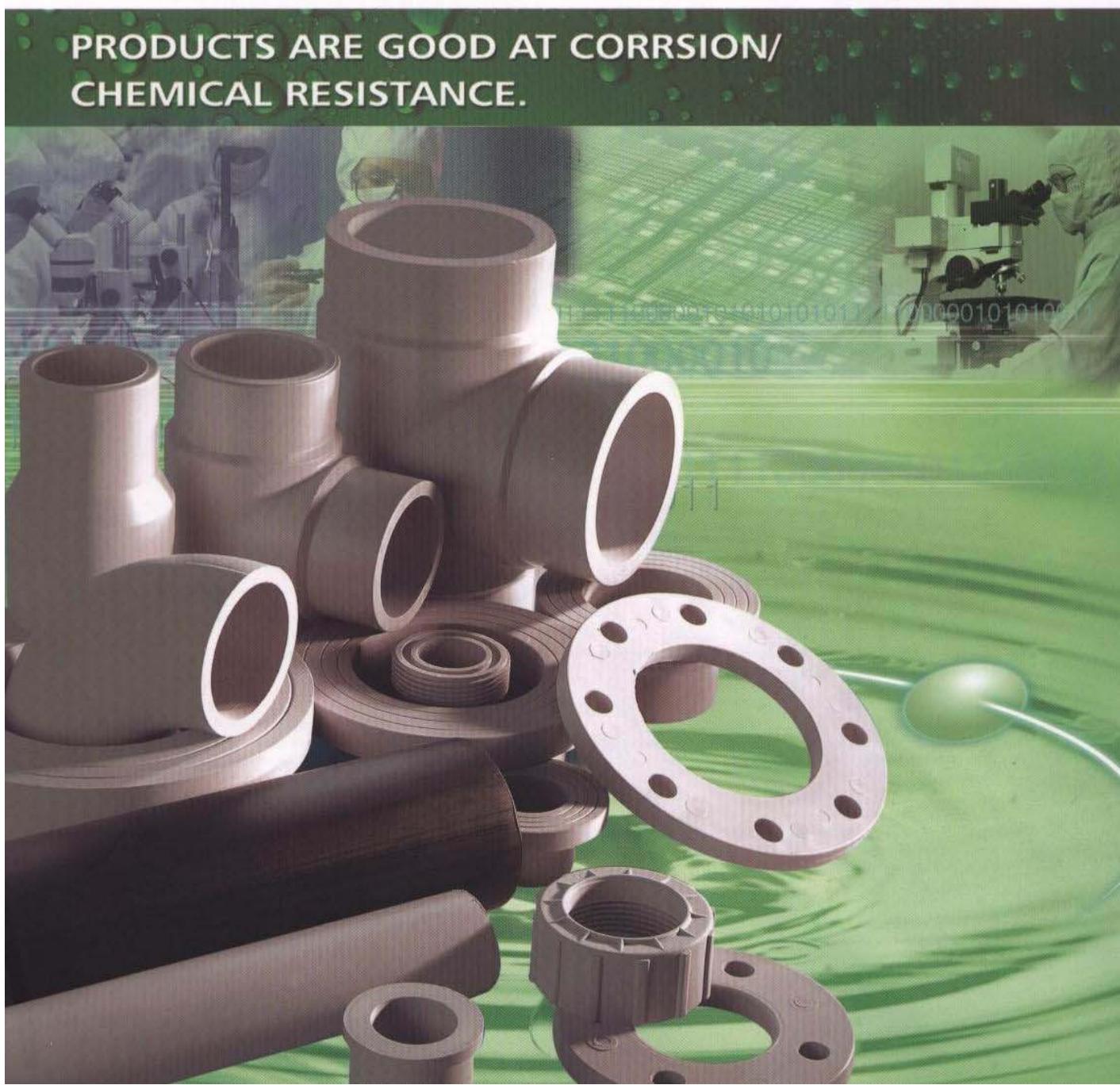




PPH and HD-PE

PIPE / FITTING / VALVE / FLANGE

PRODUCTS ARE GOOD AT CORRSION/
CHEMICAL RESISTANCE.





PIPE FITTING VALVE FLANGE

PPH.HD-

STANDARDIZATION

DIN:

DIN 1910
Welding
Welding of plastics, methods

DIN 4102, Part 1

Behaviour of building materials and components in fire
Building materials: definitions, requirements and tests

DIN 8074

High-density polyethylene (PEHD) pipes
Dimensions

DIN 8075

High-density polyethylene (PEHD) pipes
General quality requirements and testing

DIN 8077

Polypropylene(PP) pipes
Dimensions

DIN 8078

Polypropylene(PP) pipes
General quality requirements and testing

DIN 16774

Polypropylene(PP) molding materials
Classification and designation

DIN 16776

Polyethylene(PEHD) molding materials
Classification and designation

DIN 16962, Part 4

Pipe joints and fittings for polypropylene(PP) pressure pipes, type 1 and type 2
Bushings for heated tool butt welding, flanges, gaskets
Dimensions

DIN 16962, Part 5

Pipe joints and fittings for polypropylene(PP) pressure pipes.
General quality requirements, tests

DIN 16962, Part 6

Pipe joints and fittings for polypropylene(PP) pressure pipes.
Elbows injection molded for socket welding
Dimensions

DIN 16962, Part 7

Pipe joints and fittings for polypropylene(PP) pressure pipes.
Tees injection molded for socket welding
Dimensions

DIN 16962, Part 9

Pipe joints and fittings for polypropylene(PP) pressure pipes, type 1 and type 2
Socket reducers and nipples injection molded for socket welding
Dimensions

DIN 16962, Part 10

Pipe joints and fittings for polypropylene(PP) pressure pipes, type 1 and type 2
Injection molded fittings for butt welding
Dimensions

DIN 16962, Part 12

Pipe joints and fittings for polypropylene(PP) pressure pipes, type 1 and type 2
Bushings, flanges, gaskets for socket welding
Dimensions

DIN 16963, Part 4

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes
Bushings for heated tool butt welding, flanges, gaskets
Dimensions

DIN 16963, Part 5

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1
General quality requirements, tests

DIN 16963, Part 6

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes
Injection molded fittings for butt welding
Dimensions

DIN 16963, Part 8

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1 and type 2
Elbows injection molded for socket welding
Dimensions

DIN 16963, Part 9

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1 and type 2
Tees injection molded for socket welding
Dimensions

DIN 16963, Part 10

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1 and type 2
Sockets and caps injection molded for socket welding
Dimensions

DIN 16963, Part 11

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1 and type 2
Bushings, flanges, gaskets for socket welding
Dimensions

DIN 16963, Part 14

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1 and type 2
Socket reducers and nipples injection molded for socket welding
Dimensions

DIN 16963, Teil 25

Pipe joints and fittings for high density polyethylene(PEHD) pressure pipes, type 1
General quality requirements, testing, supplement to DIN 16963, Part 5



PIPE FITTING VALVE FLANGE

PPH.HD-PE

Typical application range

	only for use without UV-radiation		for piping systems laid above ground	
	PPH	PPR	PE 80	PE 100
Range of applications				
Industrial applications				
Piping systems for conveying of chemicals	●	●	●	●
Pipes for cooling water systems	●	●	●	●
Pipes for the transport of solids	●	●	●	●
Piping systems in explosion-proof rooms	-	-	-	-
High purity water piping systems	●	●	-	-
Pipes for swimming pools	●	●	●	●
Protective pipes for district heating systems	-	-	●	●
Protective pipes for cables	-	-	●	●
Apparatus engineering and vessel construction	●	●	●	●
Ventilation and degassing piping systems	●	●	●	●
Lining of containers and tanks	●	●	●	●
Construction of facilities	●	●	●	●
Applications for environmental protection				
Pipes for drainage systems	●	●	●	●
Lining of channels, channel relining	●	●	●	●
Double containment pipes	●	●	●	●
Pipes for water treatment plants	●	●	●	●
Degassing pipes for waste disposal facilities	-	-	●	●
Drainage pipes for waste disposal facilities	-	-	●	●
Applications for supply systems				
Pipes for irrigation systems	-	-	●	●
Pipes for potable water systems	-	-	●	●
Gas pipes	-	-	●	●
Discharge pipes	●	●	●	●
Applications for house installation				
Cold and hot water supply for sanitary installations	-	●	-	-
Floor heating systems	-	●	-	-



PIPE FITTING VALVE FLAN

PPH.HD

MOLDING MATERIALS

General properties of modified PP

On account of the most specific requirements arising in the construction of piping systems for the chemical industry and in apparatus engineering self-extinguishing resp. electro-conductive special types have been developed. For example static charging due to the flow of fluids or dust can arise at the operation of thermoplastics piping systems. Electro-conductable Polypropylene types have therefore been developed in order to enable a connection to earth can be performed. By supplement of additives, these modified properties are achieved. But there result alterations of the mechanical, thermal and also chemical properties in comparison to the standard type.

Differences to standard types of PP

PPR, black:

(Polypropylene-random-copolymere, black coloured)

The essential advantage of this black coloured material type is the UV resistance which is not available at the grey PP.

But there has to be reckoned on an insignificant decrease of the impact strength.

PPR, natural:

(Polypropylene-random-copolymere, natural)

As PPR contains no colour additives it is applied mainly for high purity water piping systems. But this material is not UV resistant.

General properties of PE 80

In comparison to other thermoplastics, PE 80 shows an excellent diffusion resistance and has therefore been applied for many years for the safe conveying of gases.

A further essential advantage of this black coloured material is the UV stabilization which is not given at many other thermoplastics.

Advantages of PE 80

- * low specific weight of 0.95g/cm³ (PVC 1.40g/cm³)
- * favourable transportation (e. g. coils)
- * very good chemical resistance
- * weathering resistance
- * radiation resistance
- * good weldability
- * very good abrasion resistance
- * no deposits and no overgrowth possible
- * due to less frictional resistance less pressure losses in comparison with e.g. metals
- * freeze resistance
- * very good thermoplastic processable (e.g. by deep-drawing)
- * resistant against rodents
- * resistant against all kinds of microbial corrosion

Behaviour at radiation strain

Pipes out of polyethylene may be on principle be applied for the range of high energy radiation. Pipes out of PE are well established for drainage of radioactive sewage water from hot laboratories and as cooling water piping systems for the nuclear energy technique.

The usual radioactive sewage waters contain beta and gamma emitter. PE piping systems are not getting radioactive, even at use lasting for years. Also in environment of higher activities, pipes out of PE are not damaged if they are not exposed during their complete operation time to a larger, regularly spread radiation dose of <104 Gray.

New Polyethylene type PE 100

These materials can be described also as Polyethylene types of the third generation (PE-3) resp. also as MRS 10 materials.

This is a further development of the PE materials which shows by a modified polymerisation process a amended mol mass distribution. Therefore PE 100 types have a higher density and by this also improved mechanical properties as a raised stiffness and hardness. Also the creep pressure could be raised essentially. Consequently, this material is suitable e.g. for the production of pressure pipes with larger diameters as in comparison to usual pressure pipes out of PEHD with less wall thicknesses the corresponding pressure rating will be achieved.



PIPE FITTING VALVE FLANGE

PPH.HD-PE

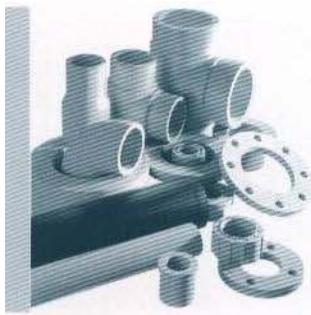
Specific properties (technical data sheet) for polypropylene (reference values)

	Property	Standard	Unit	PPH	PPR	PE80	PE100
Mechanical properties	Density at 23°C	DIN 53 479 ISO/R 1183	g/cm³	0.91	0.908	0.953	0.96
	Melt flow index	DIN 53 735	g/10 min				
	MFI 190/5 Code T	ISO 1133		0.50	0.50	0.4-0.5	0.3-0.55
	MFI 230/5 Code V			1.25	1.50	11-17	12-18
	MFI range			M 003	M 003	T 005	T 005
	Tensile stress at yield	DIN 53 455 ISO/R 527	N/mm²	30	25	21	24-25
	Elongation at yield	DIN 53 455 ISO/R 527	%	12	12	10	8
	Tensile stress at break	DIN 53 495 ISO/R 527	N/mm²	45	40	30-33	37
	Elongation at break	DIN 53 455 ISO/R 527	%	>50	>50	>600	>600
	Flexural stress at 3.5 % strain	DIN 53 452 ISO 178	N/mm²	28	22	19	23
Thermal properties	Modulus of elasticity (tensile test)	DIN 53 457 ISO 178	N/mm²	1150	750	800	1000
	Modulus in shear	DIN 53 445 ISO/R 537	N/mm²	650	400	500-600	-
	Ball indentation hardness	DIN 53 456 ISO 2039	N/mm²	67	45	40	46
	Charpy impact strength at 23°C notched	DIN 53 453 ISO 179/2C	kJ/m²	50	20	10	17-26
	Charpy impact strength at -30°C	DIN 53 453 ISO 179/2D	kJ/m²	35	50	16	9-13
	Cristallinity melting temperate	DIN 53 736	°C	160-165	150-154	128-133	128-135
	Vicat softening point	DIN 53 460	°C				
	VST-A/50	ISO/R 306		-	-	-	127
	VST-B/50			88	60	67	68-77
Electrical properties	Deflection temperature under load	DIN 53 461	°C				
	Methode A	ISO 75		50	45	42	41
	Methode B			90	68	73	61
	Thermal conductivity (at 20°C)	DIN 52 612	W/mk	0.22	0.24	0.43	0.40
	Thermal expansion coefficient	DIN 53 752	1/ °C	1x10⁻⁴	1.5x10⁻⁴	2.0x10⁻⁴	2.0x10⁻⁴
	Flammability	DIN 4102 part 1 ONORM B 3800 part 1 UL 94	- B2 B2 94-HB	B2 B2 94-HB	B2 B2 -	B2 B2 -	B2 B2 -
	Specific volume resistivity	DIN 53 482, part 1 IEC Publ.93	Ohm cm	>10¹⁶	>10¹⁶	10¹⁵	>10¹⁵
	Dielectric strength	DIN 53 481 IEC Publ. 243	kV/mm	75	75	53	22-53
	Surface resistivity	DIN 53 482 IEC Publ.167	Ohm	>10¹³	>10¹³	>10¹⁵	>10¹⁵
	Colour	RAL	-	RAL 7032 grey	RAL 7032 grey	black	black



PIPE FITTING VALVE FLAN

PPH.HD



Permissible system operating pressures for PPR depending on temperature and operation period

The in the tables stated data apply to water. They were determined from the creep curve taking into account a safety coefficient of C = 1.25 and a long term welding factor of 0.8.

Temperature [°c]	Operating period [years]	SDR 41	33	26	17.6	11	7.25	SDR 6
		S 20	16	12.5	8.3	5	3.125	S 2.5
		PN 2.5	3.2	4	6	10	16	PN 20
10	1	4.2	5.4	6.8	10.1	16.8	27.0	33.7
	5	4.0	5.	6.3	9.5	15.8	25.4	31.7
	10	3.8	4.9	6.2	9.2	15.5	24.8	30.9
	25	3.7	4.8	6.0	8.9	14.9	24.0	29.9
	50	3.6	4.7	5.8	8.7	14.5	23.3	29.2
20	1	3.6	4.6	5.7	8.6	14.3	22.9	28.6
	5	3.3	4.4	5.4	8.1	13.6	21.7	27.1
	10	3.2	4.2	5.2	7.9	13.2	21.1	26.4
	25	3.2	4.1	5.1	7.6	12.8	20.4	25.6
	50	3.1	4.0	4.9	7.4	12.4	19.8	24.8
30	1	3.0	4.0	4.9	7.3	12.3	19.6	24.5
	5	2.8	3.6	4.6	6.8	11.5	18.4	23.0
	10	2.8	3.6	4.4	6.7	11.1	17.8	22.2
	25	2.7	3.4	4.3	6.4	10.7	17.2	21.5
	50	2.6	3.3	4.2	6.3	10.4	16.8	20.9
40	1	2.5	3.3	4.1	6.2	10.4	16.5	20.7
	5	2.4	3.1	3.9	5.8	9.7	15.6	19.4
	10	2.4	3.0	3.7	5.6	9.4	15.2	18.9
	25	2.2	2.9	3.6	5.4	9.1	14.5	18.1
	50	2.2	2.8	3.5	5.2	8.8	14.1	17.6
50	1	2.1	2.8	3.5	5.2	8.8	14.0	17.5
	5	2.0	2.6	3.2	4.8	8.1	13.1	16.4
	10	2.0	2.5	3.2	4.8	7.9	12.7	15.8
	25	1.9	2.4	3.0	4.6	7.6	12.3	15.3
	50	1.8	2.4	2.9	4.4	7.4	11.9	14.8
60	1	1.8	2.4	2.9	4.4	7.4	11.9	14.8
	5	1.7	2.2	2.8	4.1	6.8	11.0	13.8
	10	1.6	2.1	2.6	4.0	6.6	10.6	13.2
	25	1.6	2.0	2.5	3.8	6.4	10.2	12.8
	50	1.5	2.0	2.4	3.7	6.2	9.9	12.4
70	1	1.6	2.0	2.4	3.7	6.2	9.9	12.4
	5	1.4	1.8	2.3	3.4	5.7	9.2	11.5
	10	1.3	1.7	2.2	3.3	5.6	8.8	11.1
	25	1.2	1.5	1.9	2.8	4.7	7.6	9.4
	50	1.0	1.3	1.6	2.4	4.0	6.5	8.1
80	1	1.2	1.6	2.0	3.1	5.2	8.4	10.4
	5	1.1	1.5	1.8	2.8	4.6	7.3	9.2
	10	0.9	1.2	1.5	2.3	3.8	6.1	7.6
	25	0.8	0.9	1.2	1.8	3.0	4.8	6.1
95	1	0.9	1.2	1.5	2.2	3.6	5.9	7.4
	5	0.6	0.8	0.9	1.5	2.4	4.0	4.9
	10	0.4	0.6	0.8	1.2	2.0	3.2	4.1

1) These operating pressures have to be reduced by the corresponding reducing coefficient for every application.

2) Operating pressures do not apply to pipes exposed to UV radiation. Within 10 years of operation this influence may be neutralized or essentially reduced by adding carbon black, etc. to the molding material.



PIPE FITTING VALVE FLANGE

PPH.HD-PE

Support distances for pipes out of PPH, PPR and PE

Conversion factors for pipes out of PEHD and PPH:

The in the table stated support distances may be changed for other pressure ratings as follows:

PN3,2	-25%
PN6	-9%
PN16	+7%

The support distances have to be reduced by 4 % for fluids with a density of 1,0 g/cm³ up to 1,25 g/cm³.

At the transportation of gases with a density of <0,01 g/cm³, the support distances can be increased as stated below:

PN6	+47%
PN10	+30%
PN16	+21%

Support distances for pipes out of PPR

On calculating the support distances for pipes out of PPR, the corresponding support distances of pipes out of PPH have to

reduced by 25%

Support distances for pipes out of PE 80 (PE 100), PN 10

da [mm]	Support distances L in[cm]at				
	20°C	30°C	40°C	50°C	60°C
16	50	45	45	40	35
20	57	55	50	45	40
25	65	60	55	55	50
32	75	75	65	65	55
40	90	85	75	75	65
50	105	100	90	85	75
63	120	115	105	100	90
75	135	130	120	110	100
90	150	145	135	125	115
110	165	160	150	145	130
125	175	170	160	155	140
140	190	185	175	165	150
160	205	195	185	175	160
200	230	220	210	200	190
225	245	235	225	215	205
250	260	250	240	230	210
280	275	265	255	240	220
315	290	280	270	255	235
355	310	300	290	275	255
400	330	315	305	290	270

Support distances for pipes out of PPH, PN 10

da [mm]	Support distances L in[cm]at							
	20°C	30°C	40°C	50°C	60°C	70°C	80°C	
16	65	62	60	57	55	52	50	
20	70	67	65	62	60	57	55	
25	80	77	75	72	70	67	65	
32	95	92	90	87	85	80	75	
40	110	107	105	100	95	92	87	
50	125	122	120	115	110	105	100	
63	145	142	140	135	130	125	120	
75	155	150	145	140	135	130	125	
90	165	160	155	150	145	140	135	
110	185	180	175	170	160	150	140	
125	200	195	190	180	170	160	150	
140	210	205	200	190	180	170	160	
160	225	220	210	200	190	180	170	
200	250	240	230	220	210	200	190	
225	265	255	245	235	225	215	200	
250	280	270	260	250	240	230	215	
280	295	285	275	265	255	245	230	
315	315	305	295	285	270	260	245	
355	335	325	315	300	285	275	260	
400	355	345	335	320	305	290	275	



PIPE FITTING VALVE FLANGE

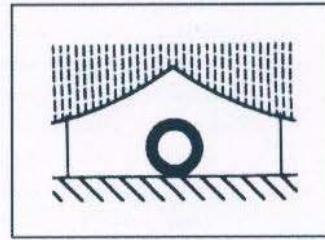
PPH.HD

WELDING INSTRUCTIONS Processing guidelines-heating element butt welding

Preparation of welding place

Assemble welding equipment (prepare tools and machinery), control welding devices

Install welding tent or similar device (if necessary).



Preparation of welding seam (at any rate immediately before starting the welding process)

Clamp and adjust the pipes or fittings the surfaces to be welded should be plane-parallel to each other. Secure longitudinal movement of the parts to be welded by taking appropriate measures (e. g. adjustable dollies).

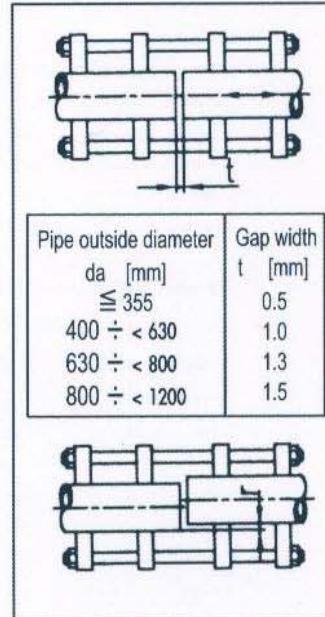
Clean outside and inside surfaces (near welding seams) of the part to be welded with acetone (or similar)

Machine both ends of the pipes to be welded (planeing).

Remove shavings from the welding area (with brush, paper, etc.).

Control plane-parallelity of welding surfaces by putting the parts together.

At the same time, check displacement of pipes x (x=0.1 .s).



Preparations before welding

In order to avoid cooling down of the pipe inside temperature by strong currents of air, it is necessary to seal the pipe end being opposite to the pipe end to be welded. Control welding temperature before each welding process (start welding process 5 min. after the heating element will have reached proper temperature at the earliest).

To prevent contaminations or damages, it is necessary to keep the heating element in a protective device before and after each welding process.

Before starting of each welding process, clean heating element with clean, fluffless paper. Determine and adjust the required welding parameters.

Measure the workpiece movement pressure Pw at the welding area and add it to the equalizing pressure and the joining pressure resp. The workpiece movement pressure is measured during slow displacement the parts to be welded, it must, however, not exceed the alignment pressure.



PIPE FITTING VALVE FLANGE

PPH.HD-PE

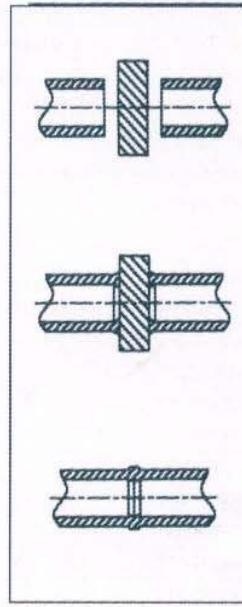
Processing guidelines-HS-Hearting element butt welding

Performing of welding process

Insert heating element.

Impose required alignment pressure. The alignment pressure is maintained until the joining faces completely align onto the heating element. By this moment, a bead must have been created (see reference values table) surrounding the whole circumference of both parts to be welded. Reduce adjusting pressure $p=0.01 \text{ N/mm}^2$ and let pass by the pre-heating time according to reference values table.

Remove heating element and join the surfaces to be welded-keep adjusting time as short as possible. Continuously increase adjusting pressure for the joining process until the required value is reached. Maintain the adjusting pressure until the welding seam has cooled down (sudden cooling with the help of cooling agents is not permitted). Remove clamps after the required cooling time.



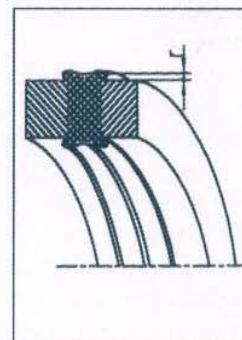
Visual control and finishing of welding joint

After joining, a bead surrounding the whole circumference must have been created.

Furthermore, the welding bead has to be inspected with a view to the following:

- almost equally sized beads
- smooth bead surface.

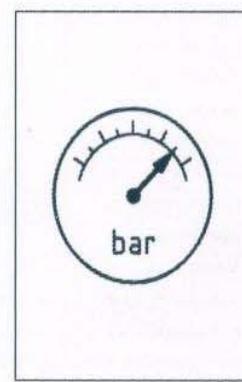
Possible differences in the formation of the beads may be justified by different flow behaviour of the joined materials. If the welding bead has to be removed for special reasons, this has to be done without leaving notches.



Performing of pressure test

Before the pressure testing, all welding joints have to be completely cooled down (as a rule, 1 hour after the last welding process). The pressure test has to be performed according to the relevant standard regulations (e. g. DVS 2210 Part 1, DVGW working sheet W210).

The hereby imposed maximum test pressure is $1.5 \times \text{PN}$, whereby during the test period (10 minutes at least) no pressure drop is allowed. The piping system has to be protected against changes of the ambient temperature (UV-radiation).





PIPE FITTING VALVE FLANGE

PPH.HD

WELDING INSTRUCTIONS

Requirements on the welding device used for heating element butt welding (following do DVS 2208, Part 1)

Clamping device

In order to avoid high local stresses in the pipe and deformations, the clamping devices should surround at least the pipe casing as parallel as possible to the welding plane. By their high stability, it must be provided that the geometric circular form of the pipes will be maintained. They must not change their position in relation to the guide elements, even under the highest working force. For fittings, such as stub flanges and welding neck flanges, special clamping devices which prevent deformations of the workpiece have to be used.

The pipe clamped at the mobile machine side has eventually to be supported and exactly adjusted by means of easy-running dollies so that the working pressures and conditions required for welding can be maintained.

It is recommendable to use clamp elements adjustable in height to allow a better centering of the workpieces.

Guide elements

Together with the clamping devices, the guide elements have to ensure that the following maximum values for gap width (measured on cold joining surfaces) are not surpassed due to bending or beaming at the least favourable point in the respective working area of the machine at max. operating pressure and with wide pipe diameters:

The gap width is measured by inserting a spacer at the point opposite to the guide while the plane-worked pipes are clamped. Guide elements have to be protected against corrosion at the sliding surfaces, e.g. by means of hard chrome plating.

Pipe outside diameter da [mm]	Gap width a [mm]
≤ 355	0,5
400 ÷ < 630	1,0
630 ÷ < 800	1,3
800 ÷ ≤ 1400	1,5

Heating elements

The heating element has to be plane-parallel with its effective area.

If size and nature of the heating elements necessitates its machine-driven removal from the joining surfaces, adequate equipment has to be provided too.

Permissible deviations from plane-parallelity (measured at room temperature after heating the elements to maximum operating temperature at least once):

The power supply has to be protected against thermal damage within the range of heating elements. Likewise, the effective surface of the heating element has to be protected against damage.

Pipe outside Ø resp. edge length	Permissible deviation
÷ 250mm	≤ 0,2 mm
÷ 500mm	≤ 0,4 mm
> 500mm	≤ 0,8 mm

Protecting devices are to be used for keeping the heating element during the intervals between the welding processes.

For processing in a workshop, the heating element is in general permanently mounted to the device. In case of a not permanently attached heating element, adequate devices have to be provided for its insertion (e.g. handles, hooks links).



PIPE FITTING VALVE FLANGE

PPH.HD-PE

Heating element socket welding (following to DVS 2207, Part 1 for PEHD and Part 11 for PP)

Welding method

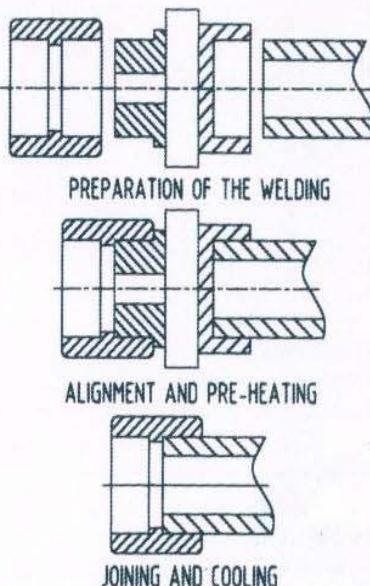
On heating element socket welding, pipe and fittings are lap-welded. The pipe end and fitting socket are heated up to welding temperature by means of a socket-like or a spigot-like heating element and afterwards, they are joined.

The dimensions of pipe end, heating element and fitting socket are coordinated so that a joining pressure builds up on joining (see schematic sketch).

Heating element socket weldings may be manually performed up to pipe outside diameters of 40 mm. Above that, use a welding device because of increasing joining forces.

The guidelines of the DVS are to be adhered to during the whole welding process!

Schematic sketch of the welding process



Pre-heating time AW

[sec]

PN6

Welding parameters

Reference values for the heating element socket welding of PP and PE 80 pipes and fittings at an outside temperature of about 20°C and low air-speed rates

Pipe outside diameter [mm]	Welding temperature [°C]	Pre-heating time t AW [sec]		Adjusting time tu [sec]	Cooling time t AK [min]
		PN6	PN10		
16			5		
20	250/270	"	5	4	2
25		"	7		
32		"	8		
40	250/270	"	12	6	4
50		"	18		
63		"	24		
75	250/270	15	30	8	6
90		22	40		
110	250/270	30	50	10	8

*not recommended because of too low wall thickness



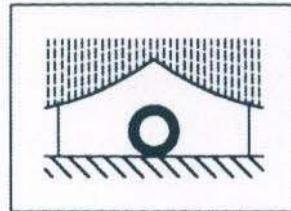
PIPE FITTING VALVE FLANGE

PPH.HD.

WELDING INSTRUCTIONS Processing guidelines-heating element socket welding

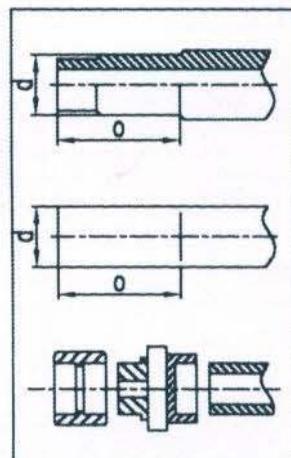
Preparation of welding place

Assemble welding equipment (Prepare tools and machinery), control welding device.
Install welding tent or similar device.



Preparation of welding seam (at any rate immediately before starting the welding process)

Cut off pipe faces at right angles and remove flashes on the inside with a knife.
Work the pipe faces with a scraper until the blades of the scraper flush with the pipe face.
Thoroughly clean welding area of pipe and fittings with fluffless paper and cleansing agents (acetone or similar). If peeling is not necessary, work the pipe surface with a scraper knife and mark the depth (t) on pipe.



Preparations before welding

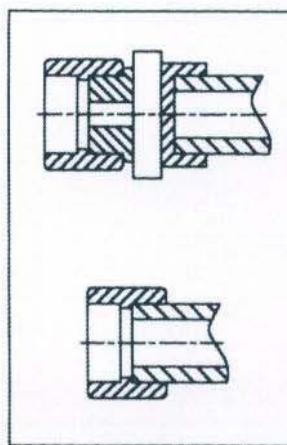
Check temperature of heating element (on heating spigot and on heating socket).
Thoroughly clean heating spigot and heating socket immediately before each welding process (with fluffless paper). At any rate, be careful that possibly clogging melt residues are removed.

Performing of welding process

Quickly push fitting and pipe in axial direction onto the heating spigot or into the heating socket until the end stop (or marking). Let pass by pre-heating time according to table values. After the pre-heating time, pull fitting and pipe off the heating element with one heave and immediately fit them into each other without twisting them until both welding beads meet.

Let the joint cool down, than remove clamps.
Only after the cooling time, the joint may be stressed by further laying processes.
On manual welding.

Adjust the parts and hold them fast under pressure for at least one minute.





PIPE FITTING VALVE FLANGE

PPH.HD-PE

PPH-PIPES

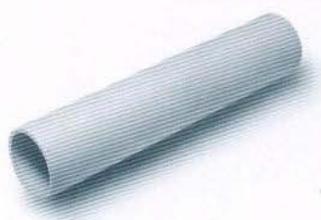
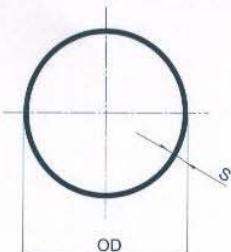
acc. to ÖNORM B 5174

DIN 8077 / 8078

Storage length: 5m

(Special lengths on request)

DFP 101



OD (mm)	Ventilation				PN 2,5 ISO S ² -20 SDR ¹ 41		PN 3,2 ISO S ² -16 SDR ¹ 33		PN 4 ISO S ² -12,5 SDR ¹ 26		PN 6 ISO S ² -8,3 SDR ¹ 17,6		PN 10 ISO S ² -5 SDR ¹ 11		PN 16 ISO S ² -3,125 SDR ¹ 7,25		
	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,05	
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,06	
16	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,08	2,3	0,10
20	-	-	-	-	-	-	-	-	-	-	1,8	0,10	2,5	0,14	2,8	0,15	
25	-	-	-	-	-	-	-	-	-	-	1,8	0,13	2,7	0,19	3,5	0,23	
32	-	-	-	-	-	-	-	-	-	-	1,9	0,18	3,0	0,27	4,5	0,38	
40	-	-	-	-	-	-	-	-	1,8	0,22	2,3	0,27	3,7	0,41	5,6	0,58	
50	-	-	-	-	-	1,8	0,27	2,0	0,30	2,9	0,42	4,6	0,64	6,9	0,90		
63	-	-	-	-	1,8	0,35	2,0	0,39	2,5	0,47	3,6	0,66	5,8	1,0	8,7	1,4	
75	-	-	-	-	1,9	0,44	2,4	0,55	2,9	0,65	4,3	0,94	6,9	1,4	10,4	2,0	
90	-	-	-	-	2,2	0,61	2,8	0,76	3,5	0,94	5,1	1,3	8,2	2,0	12,5	2,9	
110	-	-	-	-	2,7	0,9	3,5	1,2	4,3	1,4	6,3	2,0	10,0	3,0	15,2	4,3	
125	-	-	-	-	3,1	1,2	3,9	1,5	4,9	1,8	7,1	2,6	11,4	3,9	-	-	
140	-	-	-	-	3,5	1,5	4,4	1,8	5,4	2,2	8,0	3,2	12,8	4,9	-	-	
160	-	-	-	-	3,9	1,9	5,0	2,4	6,2	2,9	9,1	4,2	14,6	6,4	-	-	
180	-	-	-	-	4,4	2,4	5,6	3,0	7,0	3,7	10,2	5,2	16,4	8,1	-	-	
200	-	-	-	-	4,9	2,9	6,2	3,7	7,7	4,5	11,4	6,5	18,2	9,9	-	-	
225	-	-	-	-	5,5	3,7	7,0	4,6	8,7	5,7	12,8	8,2	20,5	12,6	-	-	
250	-	-	-	-	6,1	4,6	7,8	5,7	9,7	7,1	14,2	10,1	22,8	15,5	-	-	
280	-	-	-	-	6,9	5,7	8,7	7,2	10,8	8,8	15,9	12,6	25,5	19,5	-	-	
315	-	-	-	-	7,7	7,2	9,8	9,1	12,2	11,2	17,9	16,0	28,7	24,6	-	-	
355	-	-	-	-	8,7	9,1	11,1	11,6	13,7	14,1	20,1	20,3	32,3	31,2	-	-	
400	6,0	7,2	8,0	9,7	9,8	11,6	12,4	14,6	15,4	17,9	22,7	25,7	36,4	39,7	-	-	
450	6,0	8,2	8,0	11,0	11,0	14,7	14,0	18,4	17,4	22,7	25,5	32,5	41,0	50,2	-	-	
500	8,0	11,3	10,0	15,1	12,2	18,0	15,5	22,7	19,3	28,0	28,3	40,1	45,5	62,0	-	-	
560	10,0	16,6	-	-	13,7	22,6	17,4	28,5	21,6	35,0	31,7	50,3	-	-	-	-	
630	10,0	18,8	-	-	15,4	28,6	19,6	36,1	24,3	44,3	35,7	63,7	-	-	-	-	
710	12,0	25,3	-	-	17,4	36,4	22,1	45,8	27,4	56,3	40,2	80,8	-	-	-	-	
800	12,0	28,6	-	-	19,6	46,1	24,9	58,1	30,8	71,2	-	-	-	-	-	-	
900	15,0	40,2	-	-	22,0	58,1	28,0	73,4	34,7	90,2	-	-	-	-	-	-	
1000	15,0	44,7	-	-	24,4	71,7	31,1	90,7	38,5	111,0	-	-	-	-	-	-	
1200	18,0	64,4	-	-	29,3	103,3	37,3	130,0	-	-	-	-	-	-	-	-	

Pipes with pressure rating PN 6 und PN 10 are in PPR available on request.

1) Standard Dimension Ratio SDR = $\frac{OD}{S}$

2) Series S = $\frac{SDR-1}{2}$

3) Wall thickness "S" of pipe is calculated (in accordance with ISO 161/1-1978) by formula $S = \frac{D \cdot OD}{20 \cdot G + p}$
Minimum wall thickness=1.8mm.

4)Based on mean density 0.91g/cm³ according ÖNORM B 5174. Mean density of flame retardant PP = 0.95g/cm³.

The half value of permissible tolerance has been added to minimum wall thickness: the values have been rounded and limited to 3 digits.



PIPE FITTING VALVE FLANGE

PPH.HD

HD-PE 80-PIPES

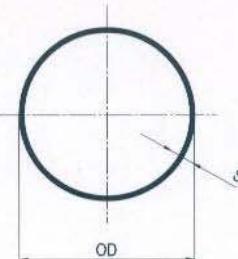
acc. to ÖNORM B 5172

DIN 8074 / 8075

Storage length: 5m

(Special lengths on request)

DFP 102



OD (mm)	Ventilation				PN 2,5 ISO S ² -20 SDR ¹ 41		PN 3,2 ISO S ² -16 SDR ¹ 33		PN 4 ISO S ² -12,5 SDR ¹ 26		PN 6 ISO S ² -8,3 SDR ¹ 17,6		PN 10 ISO S ² -5 SDR ¹ 11		PN 16 ISO S ² -3,125 SDR ¹ 7,25			
	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴	S ³ [mm]	Weight [kg/m] ⁴		
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,06	
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,07	
16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,0	0,09	2,3	0,10
20	-	-	-	-	-	-	-	-	-	-	1,8	0,10	2,5	0,14	2,8	0,15		
25	-	-	-	-	-	-	-	-	-	-	2,0	0,15	2,7	0,19	3,5	0,24		
32	-	-	-	-	-	-	-	-	-	-	2,0	0,20	3,0	0,28	4,5	0,39		
40	-	-	-	-	-	-	-	-	2,0	0,25	2,3	0,29	3,7	0,43	5,6	0,61		
50	-	-	-	-	-	1,8	0,29	2,0	0,31	2,9	0,44	4,6	0,67	6,9	0,94			
63	-	-	-	-	1,8	0,36	2,0	0,40	2,5	0,49	3,6	0,69	5,8	1,1	8,7	1,5		
75	-	-	-	-	2,0	0,46	2,4	0,57	2,9	0,68	4,3	0,98	6,9	1,5	10,4	2,1		
90	-	-	-	-	2,2	0,64	2,8	0,79	3,5	0,98	5,1	1,40	8,2	2,1	12,5	3,0		
110	-	-	-	-	2,7	0,94	3,5	1,2	4,3	1,5	6,3	2,1	10,0	3,1	15,2	4,5		
125	-	-	-	-	3,1	1,2	3,9	1,5	4,9	1,9	7,1	2,7	11,4	4,1	17,3	5,9		
140	-	-	-	-	3,5	1,5	4,4	1,9	5,4	2,3	8,0	3,3	12,8	5,1	19,4	7,3		
160	-	-	-	-	3,9	2,0	5,0	2,5	6,2	3,0	9,1	4,4	14,6	6,7	22,1	9,5		
180	-	-	-	-	4,4	2,5	5,6	3,1	7,0	3,8	10,2	5,5	16,4	8,4	24,9	12,1		
200	-	-	-	-	4,9	3,1	6,2	3,8	7,7	4,7	11,4	6,8	18,2	10,4	27,6	14,9		
225	-	-	-	-	5,5	3,9	7,0	4,8	8,7	6,0	12,8	8,6	20,5	13,1	31,1	18,8		
250	-	-	-	-	6,1	4,8	7,8	6,0	9,7	7,4	14,2	10,7	22,8	16,2	34,5	23,2		
280	-	-	-	-	6,9	6,0	8,7	7,5	10,8	9,2	15,9	13,2	25,5	20,3	38,7	29,1		
315	-	-	-	-	7,7	7,5	9,8	9,5	12,2	11,7	17,9	16,7	28,7	25,7	43,5	36,8		
355	-	-	-	-	8,7	9,5	11,1	12,1	13,7	14,7	20,1	21,2	32,3	32,6	49,0	46,7		
400	8,0	9,9	-	-	9,8	12,1	12,4	15,2	15,4	18,7	22,7	26,9	36,4	41,4	55,2	59,3		
450	8,0	11,2	-	-	11,0	15,3	14,0	19,2	17,4	23,7	25,5	34,0	41,0	52,4	-	-		
500	8,0	11,7	10,0	15,5	12,2	18,8	15,5	23,7	19,3	29,2	28,3	41,9	45,5	64,6	-	-		
560	10,0	15,5	-	-	13,7	23,6	17,4	29,7	21,6	36,6	31,7	52,5	51,0	81,1	-	-		
630	10,0	19,6	-	-	15,4	29,8	19,6	37,6	24,3	46,3	35,7	66,5	-	-	-	-		
710	12,0	26,4	-	-	17,4	38,0	22,1	47,9	27,4	58,7	40,2	84,4	-	-	-	-		
800	12,0	29,8	-	-	19,6	48,1	24,9	60,6	30,8	74,3	45,3	108,0	-	-	-	-		
900	15,0	42,0	-	-	22,0	60,7	28,0	76,6	34,7	94,2	-	-	-	-	-	-		
1000	15,0	46,7	-	-	24,4	74,9	31,1	94,7	38,5	116,0	-	-	-	-	-	-		
1200	18,0	67,1	-	-	29,3	108,0	37,3	136,0	-	-	-	-	-	-	-	-		

Pipes with pressure rating PN 6 und PN 10 are in PPR available on request.

1) Standard Dimension Ratio SDR= $\frac{OD}{S}$

2) Series S= $\frac{SDR-1}{2}$

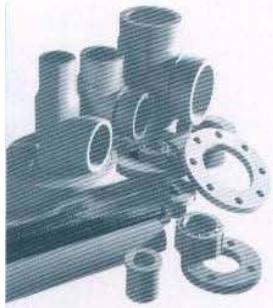
3) Wall thickness "s" of pipe is calculated (in accordance with ISO 161/1-1978) by formula s= $\frac{p \cdot OD}{20 \cdot O + p}$

Minimum wall thickness=1,8mm.

5) Pressure rating to the HD-PE100 pipes is equal 1.6 times of HD-PE80.

for example: HD-PE100 PN4=HD-PE80 PN6, and HD-PE100 PN6=HD-PE80 PN10.....

4) Based on mean density 0.95g/cm³. The half value of permissible tolerance has been



PIPE FITTING VALVE FLANGE

PPH.HD-PE

HD-PE 100-PIPES

acc. to ÖNORM B 5172

DIN 8074 / 8075

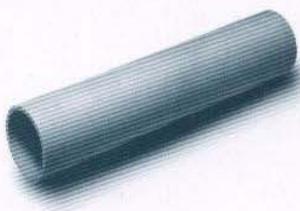
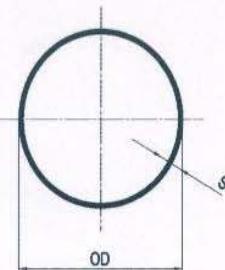
ISO 4427

CNS 2456 K3012

Storage length: 5m

(Special lengths on request)

DFP 103

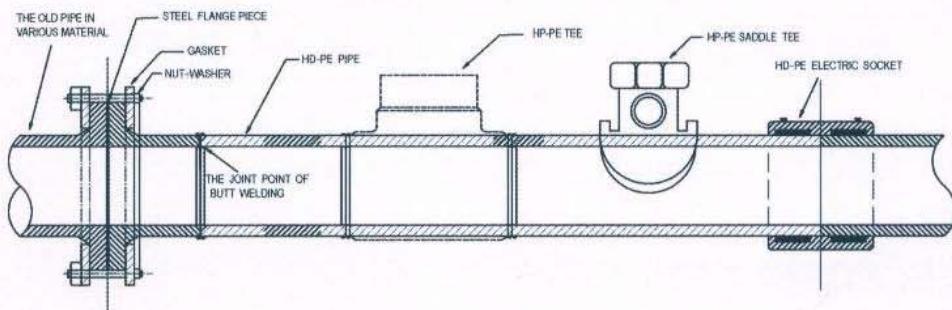




PIPE FITTING VALVE FLAN

PPH.HD

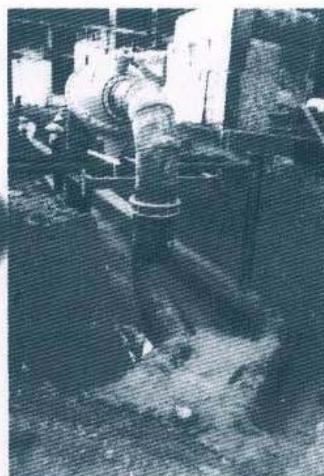
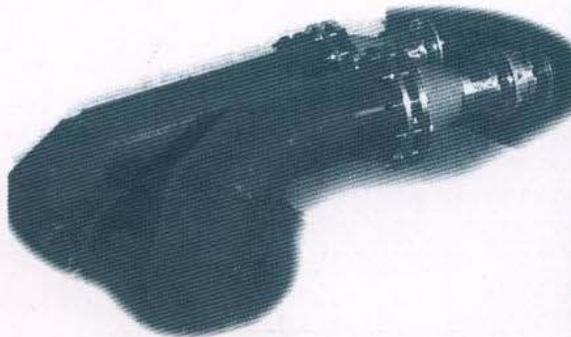
The flange connecting type for HD-PE pipe with different material of fittings, electric sockets flanges.



Flange welding connection type

The flange welding connection type is used to connect with different material convey pipeline, valves, pumps , compressors.. etc equipment's with PE pipes, or use on pipeline is designed for the future dismounting purpose.

Prepare a backing ring and a PE stub flange for joint with steel flange. Welding PE stub flange on the PE pipe end, please align the two pipelines which are going to connect with each other, put gasket between the backing rings, use bolt/ nuts to connect the flanges. Please be noted the bolts are not circular alignment , should be the corresponding alignment to tighten the bolts. Please be careful not to drag the pipeline when tighten the bolts to avoid the big electric charge occurrence.

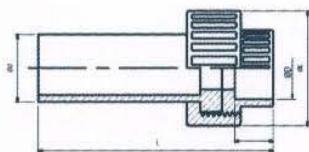




PIPE FITTING VALVE FLANGE

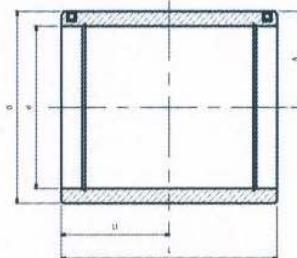
PPH.HD-PE

PE-HD/UPVC UNION TRANSIT



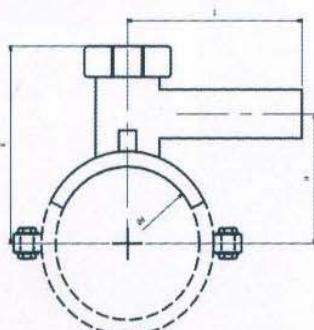
NOM SIZE	d	D	E	P	L
50-1 1/2"	20	22	46	22.2	89
63-2	25	26	61	25.4	116
75-2 1/2	32	32	67	28.6	126
90-3	50	48	85	34.9	151
110-4	63	60	99	38.1	173
125-5	90	89	184	47.6	233

PE-HD ELECTRIC SOCKETS



NOM SIZE	d	D	E	P	L
20-1/2"	20	31	40	34	80
25-3/4"	25	36	42	37	85
32-1"	32	44	46	40	92
40-1 1/4"	40	54	51	44	103
50-1 1/2"	50	66	56	49	112
63-2"	63	83	64	56	129
75-2 1/2"	75	96	66	62	133
90-3"	90	114	70	69	141
110-4"	110	140	76	79	152
125-5"	125	161	85	87	171
140-5"	140	180	90	94	181
160-6"	160	200	90	104	180
180-6"	180	222	100	114	202
225-8"	225	276	116	137	232
250-10"	250	301	112	151	225
280-10"	280	339	136	166	275
315-12"	315	381	140	184	284

PE-HD SADDLE TEE



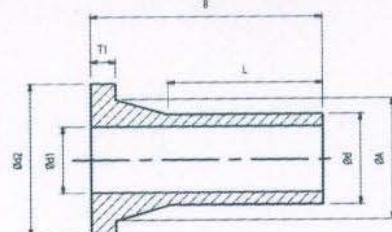
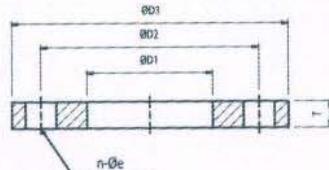
NOM SIZE	d	K	H	L
125×25 100×20	125	157.5	92.5	118
125×32 100×25	125	157.5	92.5	118
125×50 100×40	125	157.5	92.5	118
180×25 150×20	180	185.0	120	118
180×32 150×25	180	185.0	120	118
180×50 150×40	180	185.0	120	118
225×25 200×20	225	232.0	148	118
225×32 200×25	225	232.0	148	118
225×50 200×40	225	232.0	148	118
315×32 315×50	315	277	194	118
450×25 450×32 450×50	450	345	261	118



PIPE FITTING VALVE FLANGE

PPH.HD.

HD-PE BACKING RING (FOR WATER SUPPLY USE)



NOM SIZE	D1	D2	D3	N	e	T	d	d1	d2	A	L	B	T1
50--1 1/2	63	110	150	4	18	20	50	55	88	61	58	85	12
63--2	77	120	155	4	19	20	63	67.4	102	75	61	95	14
75--2 1/2	91	148	183	4	19	20	75	80	122	89	89	125	16
90--3	107	168	211	4	19	21	90	94.2	138	105	103	140	17
110--4	129	195	238	4	19	21	110	111.8	158	125	117	160	18
125--5	136	220	263	6	19	22	125	117.2	158	132	125	170	25
180--6	184	247	290	6	19	22	180	158.6	212	180	140	200	30
225--8	239	299	342	8	19	23	225	208.2	268	235	138	200	32
280--10	295	360	410	8	23	24	280	257.8	320	291	210	375	35
315--12	339	414	464	10	23	25	315	297.6	370	335	210	375	35
355--14	379	472	530	1	25	26	355	330.8	430	373	200	375	40
400--16	433	524	582	12	25	27	400	379.6	482	427	309	400	46
450--18	520	585	652	12	27	28	450	460.6	585	514	295	400	60
500--20	536	639	706	12	27	29	500	470.6	585	530	290	400	60
630--24	-	743	810	16	27	30	600					400	
710--28	-	854	928	16	33	32	700					400	
800--32	850	960	1034	20	33	34	800	745.2	905	840	280	400	70
900--36	954	1073	1156	20	33	36	900	837.2	1005	944	280	400	80
1000--40	1057	1179	1262	24	33	38	1000	928.2	1110	1047	250	400	80
1100--44	-	1283	1366	24	33	41	1100					400	80
1200--48	1255	1387	1470	28	33	43	1200	1103.8	1330	1245	250	400	80
1500--60	-	1710	1800	32	39	48	1500					400	100
1600--64	1662	1820	1915	36	39	53	1600	1483.8	1737	1652	230	400	100

HD-PE COMPRESSION FITTINGS



COUPLING
20 25 32 40 50 63 75 90 110



90° ELBOW
20 25 32 40 50 63 75 90 110



TEE
20 25 32 40 50 63 75 90 110



REDUCING TEE
25×20 32×25 40×32 50×40
63×50 75×63 90×75 110×90



REDUCING COUPLING
20×16 25×20 32×20 32×25 40×25 40×32
50×25 50×32 50×40 63×32 63×40 63×50
75×50 75×63 90×63 90×75 110×90



FLANGED JOINT
50 63 75 90 110



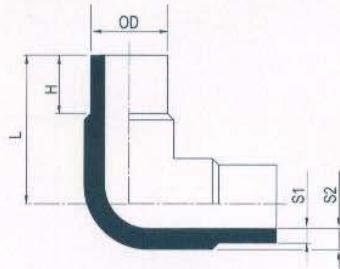
PIPE FITTING VALVE FLANGE

PPH.HD-PE

BENDS 90°

for butt welding
molded from **PPR/PE80/PE100**

DFP 302

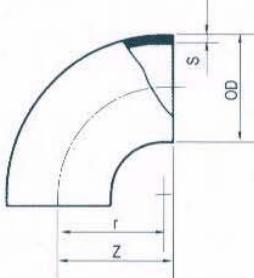


OD (in) : (mm)	H (mm)	L (mm)	S1 (mm)	S2 (mm)
1/2"-20	14	35±2.5	2.5	3.3
3/4"-25	15.5	40±2.5	2.7	4.0
1"-32	17	46±2.5	3.0	4.5
1 1/4"-40	11	44±2.5	3.7	6.8
1 1/2"-50	14	52±2.5	4.6	7.0
2"-63	18	65±2.5	5.8	10.7
2 1/2"-75	15	75±2.5	6.9	9.5
3"-90	38	103±2.5	8.2	13.1
4"-110	49	120±2.5	10.0	15.0

BENDS 90°

for butt welding
molded from **PPR/PE80/PE100**

DFP 302-I



OD (mm)	r (mm)	z PPR (mm)	z PE80 (mm)	PN6/ISO S-8.3/SDR 17.6		PN10/ISO S-5/SDR 11	
				S (mm)	Weight (Kg/Pc.)	S (mm)	Weight (Kg/Pc.)
20	23	32±2.5	32±2.5			2.5	0.01
25	30	38±2.5	38±2.5			2.7	0.01
32	32	34±2.5	34±2.5			3.0	0.02
40	40	46±2.5	46±2.5			3.7	0.03
50	50	58±2.5	58±2.5	2.9	0.07	4.6	0.10
63	60	70±2.5	70±2.5	3.6	0.11	5.8	0.15
75	72	85±2.5	85±2.5	4.3	0.16	6.9	0.22
90	85	100±2.5	100±2.5	5.1	0.22	8.2	0.33
110	105	124±2.5	124±2.5	6.3	0.37	10.0	0.62
125	125	140±4	140±4	7.1	0.56	11.4	0.79
140	140	150±4	150±4	8.0	0.75	12.8	1.25
160	155	180±4	180±4	9.1	1.20	14.6	1.70
180	175	200±4	200±4	10.2	1.55	16.4	2.40
200	195	210±4	200±4	11.4	2.20	18.2	3.26
225	225	250±4	250±4	12.8	3.91	20.5	4.46
250	255	285±5	285±5	14.2	3.94	22.8	6.27
280	260	290±5	290±5	15.9	5.66	25.5	8.58
315	300	340±5	335±5	17.9	6.68	28.7	9.83
355	300	340±5	340±5	20.1	11.30	32.3	17.20
400	300	340±5	340±5	22.7	15.70	36.4	23.00



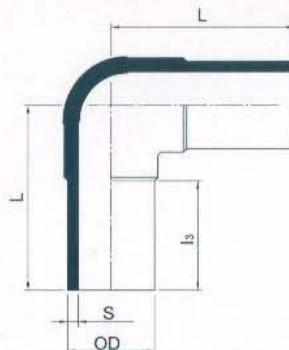
PIPE FITTING VALVE FLANGE

PPH.HD

ELBOWS 90°

elongated
for butt welding
molded from PPR/PE80/PE100

DFP 303



OD (mm)	I_3 (mm)	L (mm)	PN6/ISO S-8.3/SDR 17.6		PN10/ISO S-5/SDR 11	
			S (mm)	Weight (Kg/Pc.)	S (mm)	Weight (Kg/Pc.)
20	60 ± 1.5	70 ± 1.5	-	-	3.0	0.02
25	67 ± 1.5	80 ± 1.5	-	-	3.0	0.03
32	55 ± 1.5	73 ± 1.5	-	-	3.0	0.05
40	69 ± 1.5	83 ± 1.5	-	-	3.7	0.09
50	68 ± 1.5	93 ± 1.5	-	-	4.6	0.16
63	78 ± 1.5	109 ± 1.5	3.6	0.19	5.8	0.29
75	90 ± 1.5	135 ± 1.5	4.3	0.22	6.9	0.30
90	84 ± 1.5	129 ± 1.5	5.1	0.36	8.2	0.53
110	91 ± 1.5	149 ± 1.5	6.3	0.60	10.0	0.89
125	98 ± 2	165 ± 2	7.1	0.88	11.4	1.29
160	108 ± 2	190 ± 2	9.1	1.50	14.6	2.46
180	133 ± 2	228 ± 2	10.2	2.41	16.4	3.48
200	118 ± 2	220 ± 2	11.4	2.98	18.2	4.48
225	122 ± 2.5	239 ± 2.5	12.8	3.92	20.5	5.85
250	182 ± 4	307 ± 4	14.2	6.45	22.8	9.23
280	196 ± 4	336 ± 4	15.9	9.00	25.5	12.74
315	212 ± 4	372 ± 4	17.9	2.00	28.7	18.30

OD (mm)	I_3 (mm)	L (mm)	PN16/ISO S-3.125/SDR 7.25	
			S (mm)	Weight (Kg/Pc.)
32	55 ± 1.5	73 ± 1.5	4.5	0.05
40	69 ± 1.5	83 ± 1.5	5.6	0.10
50	68 ± 1.5	93 ± 1.5	6.9	0.17
63	78 ± 1.5	109 ± 1.5	8.7	0.30
75	90 ± 1.5	135 ± 1.5	10.4	0.51
90	82 ± 1.5	128 ± 1.5	12.5	0.74
110	89 ± 1.5	141 ± 1.5	15.2	1.22
125	104 ± 2	170 ± 1.5	17.3	1.80
160	110 ± 2	184 ± 2	22.1	3.20
200	118 ± 2.5	217 ± 2	27.6	6.03
225	120 ± 2.5	232 ± 2.5	31.1	8.00
250	183 ± 4	307 ± 4	34.5	12.70



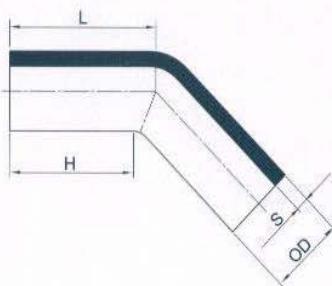
PIPE FITTING VALVE FLANGE

PPH.HD-PE

ELBOWS 45°

elongated
for butt welding
molded from PPR/PE80/PE100

DFP 401



OD (mm)	H (mm)	L (mm)	PN6/ISO S-8.3/SDR 17.6		PN10/ISO S-5/SDR 11	
			S (mm)	Weight (Kg/Pc.)	S (mm)	Weight (Kg/Pc.)
20	39 ^{±1.5}	44 ^{±1.5}	-	-	3.0	0.02
25	42 ^{±1.5}	48 ^{±1.5}	-	-	3.0	0.03
32	49 ^{±1.5}	57 ^{±1.5}	-	-	3.0	0.04
40	53 ^{±1.5}	63 ^{±1.5}	-	-	3.7	0.06
50	57 ^{±1.5}	70 ^{±1.5}	-	-	4.6	0.10
63	64 ^{±1.5}	80 ^{±1.5}	3.6	0.11	5.8	0.17
75	70 ^{±1.5}	95 ^{±1.5}	4.3	0.17	6.9	0.26
90	82 ^{±1.5}	104 ^{±1.5}	5.1	0.30	8.2	0.44
110	82 ^{±1.5}	108 ^{±1.5}	6.3	0.45	10.0	0.68
125	100 ^{±2}	133 ^{±2}	7.1	0.70	11.4	1.03
160	117 ^{±2}	157 ^{±2}	9.1	1.32	14.6	2.05
180	132 ^{±2}	177 ^{±2}	10.2	2.04	16.4	2.86
200	121 ^{±2}	171 ^{±2}	11.4	2.26	18.2	3.56
225	126 ^{±2.5}	183 ^{±2.5}	12.8	3.10	20.5	4.76
250	157 ^{±4}	219 ^{±4}	14.2	4.65	22.8	6.80
280	174 ^{±4}	244 ^{±4}	15.9	6.20	25.5	9.30
315	177 ^{±4}	256 ^{±4}	17.9	8.58	28.7	12.30

OD (mm)	H (mm)	L (mm)	PN16/ISO S-3.125/SDR 7.25	
			S (mm)	Weight (Kg/Pc.)
32	48 ^{±1.5}	56 ^{±1.5}	4.5	0.04
40	53 ^{±1.5}	63 ^{±1.5}	5.6	0.08
50	61 ^{±1.5}	73 ^{±1.5}	6.9	0.13
63	64 ^{±1.5}	80 ^{±1.5}	8.7	0.22
75	71 ^{±1.5}	90 ^{±1.5}	10.4	0.37
90	79 ^{±1.5}	95 ^{±1.5}	12.5	0.60
110	82 ^{±1.5}	106 ^{±1.5}	15.2	0.97
125	98 ^{±2}	129 ^{±2}	17.3	1.34
160	112 ^{±2}	152 ^{±2}	22.1	2.74
200	135 ^{±2}	185 ^{±2}	27.6	5.26
225	148 ^{±2.5}	204 ^{±2.5}	31.1	7.00
250	157 ^{±4}	220 ^{±4}	34.5	9.60



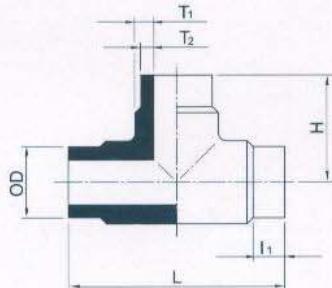
PIPE FITTING VALVE FLANGE

PPH.HD

TEES

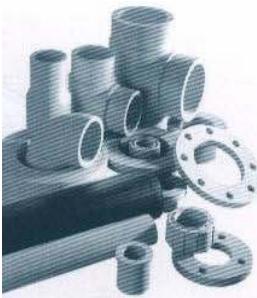
reinforced
for butt welding
out of PPR/PE80/PE100

DFP 201



OD (mm)	L (mm)	I ₁ (mm)	H (mm)	PN6 /ISO S-8.3/SDR 17.6			Weight (kg/pc.)
				T ₂ (mm)	T ₁ (mm)		
50	120 ^{±2.5}	23 ^{±1.5}	60 ^{±1.5}	2.9	5.6		0.08
63	149 ^{±2.5}	28 ^{±1.5}	75 ^{±1.5}	3.6	7.0		0.18
75	174 ^{±2.5}	28 ^{±1.5}	87 ^{±1.5}	4.3	7.0		0.32
90	181 ^{±2.5}	33 ^{±1.5}	92 ^{±2}	5.1	10.0		0.52
110	216 ^{±2.5}	33 ^{±1.5}	110 ^{±2}	6.3	11.0		0.92
125	225 ^{±3}	39 ^{±2}	113 ^{±2}	7.1	13.0		1.44
140	242 ^{±4}	23 ^{±2}	120 ^{±2}	8.0	14.5		2.16
160	273 ^{±4}	44 ^{±2}	135 ^{±2}	9.1	15.6		2.40
180	308 ^{±4}	49 ^{±2}	154 ^{±2.5}	10.2	20.0		3.14
200	340 ^{±4}	49 ^{±2}	165 ^{±2.5}	11.4	22.2		4.20
225	450 ^{±4}	62 ^{±2}	225 ^{±2.5}	12.8	23.7		6.10
250	440 ^{±6}	55 ^{±3}	220 ^{±3}	14.2	21.8		6.90
280	510 ^{±6}	65 ^{±3}	252 ^{±3}	15.9	25.5		10.10
315	555 ^{±6}	75 ^{±3}	275 ^{±3}	17.9	30.0		14.00
355	665 ^{±6}	97 ^{±3}	332 ^{±3}	20.1	27.5		22.75
400	674 ^{±6}	97 ^{±3}	337 ^{±3}	22.7	31.9		30.50

OD (mm)	L (mm)	I ₁ (mm)	H (mm)	PN10/ISO S-5/SDR11			Weight (kg/pc.)
				T ₂ (mm)	T ₁ (mm)		
20	70 ^{±2.5}	15 ^{±2.5}	35 ^{±2.5}	2.5	3.3		0.02
25	80 ^{±2.5}	15 ^{±2.5}	40 ^{±2.5}	2.7	4.0		0.02
32	89 ^{±2.5}	17 ^{±2.5}	45 ^{±2.5}	3.0	4.5		0.04
40	100 ^{±2.5}	16 ^{±2.5}	50 ^{±2.5}	3.7	6.8		0.06
50	120 ^{±2.5}	23 ^{±2.5}	60 ^{±2.5}	4.6	7.0		0.10
63	149 ^{±2.5}	28 ^{±2.5}	75 ^{±2.5}	5.8	10.7		0.24
75	174 ^{±2.5}	28 ^{±2.5}	87 ^{±2.5}	6.9	9.5		0.40
90	181 ^{±2.5}	33 ^{±2.5}	92 ^{±2.5}	8.2	13.1		0.72
110	216 ^{±2.5}	33 ^{±2.5}	110 ^{±2.5}	10.0	15.0		1.25
125	225 ^{±4}	39 ^{±2.5}	113 ^{±2.5}	11.4	17.0		1.63
140	242 ^{±4}	23 ^{±2.5}	120 ^{±2.5}	12.8	19.0		2.45
160	273 ^{±4}	44 ^{±2.5}	135 ^{±4}	14.6	20.0		3.40
180	308 ^{±4}	49 ^{±2.5}	154 ^{±4}	16.4	25.9		4.48
200	340 ^{±4}	49 ^{±2.5}	165 ^{±4}	18.2	29.8		5.96
225	450 ^{±4}	62 ^{±2.5}	225 ^{±4}	20.5	33.8		8.50
250	440 ^{±4}	55 ^{±4}	220 ^{±5}	22.8	31.0		9.86
280	510 ^{±5}	65 ^{±4}	252 ^{±5}	25.5	35.5		13.75
315	555 ^{±5}	75 ^{±4}	275 ^{±5}	28.7	41.9		18.30
355	665 ^{±5}	97 ^{±4}	332 ^{±5}	32.3	40.0		30.50
400	674 ^{±5}	97 ^{±4}	337 ^{±5}	36.4	45.0		39.00



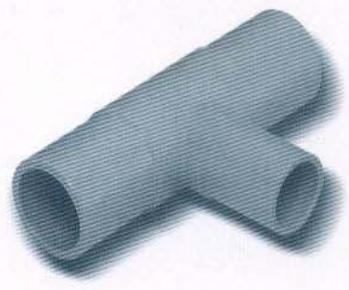
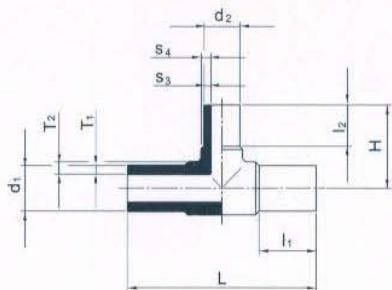
PIPE FITTING VALVE FLANGE

PPH.HD-PE

TEES

reinforced,
with reduced branch
for butt welding
out of PPR/PE80/PE100

DFP 501



d ₁ (mm)	d ₂ (mm)	L (mm)	l ₁ (mm)	l ₂ (mm)	H (mm)	PN6/ISO S-8.3/SDR17.6				
						T ₁ (mm)	T ₂ (mm)	S ₃ (mm)	S ₄ (mm)	Weight (Kg/Pc.)
90	32	203 ^{±4}	53 ^{±2}	23 ^{±2}	85 ^{±2}	5.1	8.1	3.0	5.0	0.45
90	50	203 ^{±4}	53 ^{±2}	28 ^{±2}	94 ^{±2}	5.1	10.0	2.9	5.0	0.46
90	63	203 ^{±4}	53 ^{±2}	31 ^{±2}	97 ^{±2}	5.1	11.1	3.6	7.0	0.47
110	32	234 ^{±4}	66 ^{±2}	22 ^{±2}	91 ^{±2}	6.3	12.9	3.0	5.0	0.73
110	50	234 ^{±4}	66 ^{±2}	27 ^{±2}	101 ^{±2}	6.3	12.7	2.9	6.0	0.73
110	63	234 ^{±4}	70 ^{±2}	33 ^{±2}	106 ^{±2}	6.3	12.0	3.6	8.0	0.73
110	90	234 ^{±4}	44 ^{±2}	38 ^{±2}	114 ^{±2}	6.3	11.3	5.1	10.0	0.90
125	63	264 ^{±6}	70 ^{±3}	31 ^{±2}	110 ^{±3}	7.1	14.9	3.6	8.0	1.04
125	90	264 ^{±6}	45 ^{±3}	42 ^{±2}	123 ^{±3}	7.1	15.7	5.1	11.0	1.30
140	63	291 ^{±6}	83 ^{±3}	32 ^{±2}	120 ^{±3}	8.0	15.1	3.6	8.0	1.33
140	75	291 ^{±6}	81 ^{±3}	35 ^{±2}	130 ^{±3}	8.0	13.9	4.3	9.0	1.58
140	90	291 ^{±6}	81 ^{±3}	41 ^{±2}	130 ^{±3}	8.0	14.9	5.1	10.0	1.60
140	110	291 ^{±6}	50 ^{±3}	44 ^{±2}	140 ^{±3}	8.0	16.2	6.3	13.0	1.80
160	63	320 ^{±6}	87 ^{±3}	32 ^{±2}	130 ^{±3}	9.1	15.4	3.6	9.0	2.02
160	90	315 ^{±6}	84 ^{±3}	39 ^{±2}	138 ^{±3}	9.1	15.7	5.1	11.0	2.02
160	110	315 ^{±6}	83 ^{±3}	65 ^{±2}	161 ^{±3}	9.1	16.4	6.3	12.0	2.08
160	125	315 ^{±6}	58 ^{±3}	47 ^{±3}	150 ^{±3}	9.1	15.6	7.1	13.0	2.22
180	63	348 ^{±6}	125 ^{±3}	30 ^{±2}	140 ^{±3}	10.2	16.1	3.6	8.0	2.28
180	75	348 ^{±6}	112 ^{±3}	30 ^{±2}	160 ^{±3}	10.2	16.2	4.3	7.0	2.30
180	90	348 ^{±6}	110 ^{±3}	40 ^{±2}	146 ^{±3}	10.2	15.1	5.1	11.0	2.36
180	110	348 ^{±6}	98 ^{±3}	44 ^{±2}	150 ^{±3}	10.2	16.0	6.3	12.0	2.42
180	125	348 ^{±6}	92 ^{±3}	50 ^{±3}	150 ^{±3}	10.2	16.2	7.1	14.0	2.48
200	63	382 ^{±8}	143 ^{±4}	31 ^{±2}	145 ^{±3}	11.4	17.7	3.6	8.0	3.20
200	90	390 ^{±8}	126 ^{±4}	40 ^{±2}	162 ^{±3}	11.4	17.3	5.1	11.0	3.34
200	110	390 ^{±8}	122 ^{±4}	40 ^{±2}	160 ^{±3}	11.4	20.1	6.3	13.0	2.40
200	125	390 ^{±8}	114 ^{±4}	43 ^{±3}	165 ^{±3}	11.4	19.3	7.1	14.0	3.47
200	160	390 ^{±8}	98 ^{±4}	60 ^{±3}	180 ^{±3}	11.4	20.1	9.1	16.8	3.77
225	90	440 ^{±8}	159 ^{±4}	40 ^{±2}	170 ^{±3}	12.8	19.9	5.1	11.7	4.07
225	110	440 ^{±8}	145 ^{±4}	38 ^{±2}	174 ^{±3}	12.8	19.6	6.3	13.0	4.60
225	125	440 ^{±8}	135 ^{±4}	40 ^{±3}	180 ^{±3}	12.8	20.1	7.1	14.0	4.66
225	160	440 ^{±8}	150 ^{±4}	60 ^{±2}	190 ^{±3}	12.8	20.4	9.1	17.1	4.92
250	110	443 ^{±8}	135 ^{±4}	33 ^{±2}	195 ^{±3}	14.2	20.2	6.3	13.0	6.14
250	160	440 ^{±8}	110 ^{±4}	58 ^{±3}	213 ^{±3}	14.2	22.1	9.1	15.0	6.30

*These fittings in PPR are discontinued and only deliverable according to the available stock quantities.

As replacement for these fittings, tees elongated are provided.



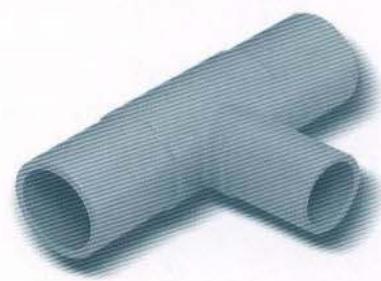
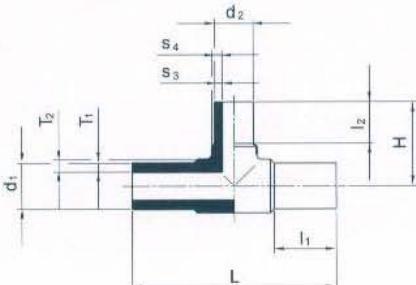
PIPE FITTING VALVE FLAN

PPH.HD

TEES

reinforced,
with reduced branch
for butt welding
out of PPR/PE80/PE100

DFP 502



d ₁ (mm)	d ₂ (mm)	L (mm)	l ₁ (mm)	l ₂ (mm)	H (mm)	PN10/ISO S-5/SDR 11				
						T ₁ (mm)	T ₂ (mm)	s ₃ (mm)	s ₄ (mm)	Weight (Kg/Pc.)
90	32	203 ^{±4}	52 ^{±2}	23 ^{±2}	85 ^{±2}	8.2	14.2	3.0	6.3	0.59
90	50	203 ^{±4}	52 ^{±2}	27 ^{±2}	93 ^{±2}	8.2	14.0	4.6	8.4	0.60
*90	63	203 ^{±4}	53 ^{±2}	31 ^{±2}	95 ^{±2}	8.2	14.2	5.8	9.0	0.62
110	32	230 ^{±4}	65 ^{±2}	23 ^{±2}	100 ^{±2}	10.0	16.6	3.0	6.1	0.91
110	50	230 ^{±4}	65 ^{±2}	27 ^{±2}	113 ^{±2}	10.0	16.5	4.6	8.5	0.95
*110	63	230 ^{±4}	65 ^{±2}	31 ^{±2}	107 ^{±2}	10.0	16.8	5.8	10.0	1.00
*110	90	230 ^{±4}	40 ^{±2}	40 ^{±2}	115 ^{±3}	10.0	17.2	8.2	16.4	1.13
125	63	265 ^{±4}	70 ^{±2}	31 ^{±2}	112 ^{±3}	11.4	18.6	5.8	11.3	1.43
125	90	265 ^{±4}	45 ^{±2}	40 ^{±2}	120 ^{±3}	11.4	20.4	8.2	14.0	1.70
140	63	290 ^{±4}	82 ^{±2}	32 ^{±2}	120 ^{±3}	12.8	20.7	5.8	11.5	1.80
140	75	290 ^{±4}	82 ^{±2}	35 ^{±2}	130 ^{±3}	12.8	18.0	6.9	11.0	1.88
140	90	290 ^{±4}	82 ^{±2}	38 ^{±2}	130 ^{±3}	12.8	19.2	8.2	13.2	1.94
140	110	290 ^{±4}	50 ^{±2}	43 ^{±2}	137 ^{±3}	12.8	21.6	10.0	17.5	2.22
160	63	315 ^{±4}	84 ^{±2}	32 ^{±2}	132 ^{±3}	14.6	20.1	5.8	12.0	2.65
*160	90	315 ^{±4}	84 ^{±3}	39 ^{±2}	140 ^{±3}	14.6	19.0	8.2	15.0	2.70
*160	110	315 ^{±4}	84 ^{±3}	63 ^{±2}	158 ^{±3}	14.6	21.3	10.0	17.3	2.84
160	125	315 ^{±4}	59 ^{±3}	48 ^{±2}	150 ^{±3}	14.6	20.5	11.4	18.2	2.96
180	63	348 ^{±4}	125 ^{±3}	32 ^{±2}	140 ^{±3}	16.4	20.8	5.8	11.9	3.32
180	75	348 ^{±4}	115 ^{±3}	31 ^{±2}	140 ^{±3}	16.4	22.0	6.9	10.5	3.35
180	90	348 ^{±4}	108 ^{±3}	38 ^{±2}	145 ^{±3}	16.4	22.0	8.2	15.3	3.35
180	110	348 ^{±4}	102 ^{±3}	43 ^{±2}	150 ^{±3}	16.4	22.0	10.0	16.2	3.52
180	125	348 ^{±4}	93 ^{±3}	50 ^{±2}	155 ^{±3}	16.4	22.7	11.4	18.8	3.55
200	63	388 ^{±4}	145 ^{±3}	32 ^{±2}	150 ^{±4}	18.2	24.9	5.8	11.5	4.68
200	90	388 ^{±4}	125 ^{±3}	38 ^{±2}	163 ^{±4}	18.2	25.1	6.2	15.0	4.80
200	110	388 ^{±4}	120 ^{±3}	33 ^{±2}	155 ^{±4}	18.2	25.6	10.0	16.6	4.82
200	125	388 ^{±4}	115 ^{±3}	43 ^{±2}	165 ^{±4}	18.2	25.8	11.4	18.4	5.00
200	160	388 ^{±6}	98 ^{±3}	53 ^{±3}	178 ^{±4}	18.2	27.3	14.6	22.6	5.30
225	90	435 ^{±6}	153 ^{±3}	40 ^{±2}	168 ^{±4}	20.5	25.5	8.2	13.2	6.46
*225	110	435 ^{±6}	142 ^{±3}	33 ^{±2}	165 ^{±4}	20.5	26.0	10.0	17.0	6.44
225	125	435 ^{±6}	136 ^{±3}	40 ^{±2}	173 ^{±4}	20.5	27.5	11.4	19.3	6.56
*225	160	435 ^{±6}	115 ^{±3}	68 ^{±3}	190 ^{±4}	20.5	28.4	14.6	22.8	6.96
250	110	435 ^{±6}	134 ^{±3}	37 ^{±2}	195 ^{±4}	22.8	28.3	10.0	16.0	8.20
250	160	440 ^{±6}	115 ^{±3}	58 ^{±3}	213 ^{±4}	22.8	30.6	14.6	21.0	8.90

*These fittings in PPR are discontinued and only deliverable according to the available stock quantities.

As replacement for these fittings, tees elongated are provided.



PIPE FITTING VALVE FLANGE

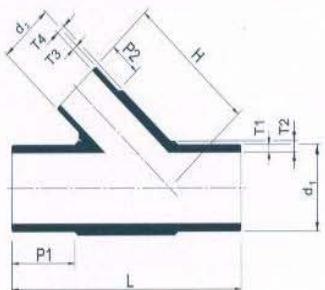
PPH.HD-PE

Y TEE

for butt welding

molded from **PPR/PE80/PE100**

DFP 503



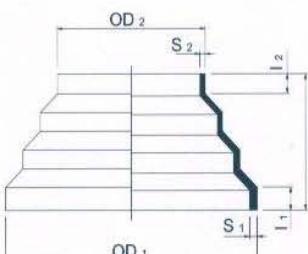
PN10/ISO S-5/SDR 11

d ₁ (mm)	d ₂ (mm)	L (mm)	P ₁ (mm)	P ₂ (mm)	H (mm)	PN10/ISO S-5/SDR 11				
						T ₁ (mm)	T ₂ (mm)	T ₃ (mm)	T ₄ (mm)	Weight (Kg/Pc.)
90	63	242 ^{±4}	53 ^{±2}	31 ^{±2}	157.2 ^{±2}	8.2	14.2	5.8	9.0	0.71
110	63	273 ^{±4}	65 ^{±2}	31 ^{±2}	172.5 ^{±2}	10.0	16.8	5.8	10.0	1.10
160	90	356 ^{±4}	84 ^{±2}	39 ^{±2}	233.6 ^{±2}	14.6	19.0	8.2	15.0	2.63
160	110	374 ^{±4}	84 ^{±2}	63 ^{±2}	263.5 ^{±2}	14.6	21.3	10.0	17.3	3.16

REDUCER CONCENTRIC

Butt-fusion

molded from **PPR/PE80/PE100**



OD ₁ /OD ₂ (mm)	L (mm)	I ₁ ^{±3} (mm)	I ₂ ^{±3} (mm)	S ₁ (mm)	S ₂ (mm)	Gewicht weight (kg)
63/16	55 ^{±3}	9	5	5.8	1.8	0.035
110/63	65 ^{±3}	11	7	10	5.8	0.145
160/110	85 ^{±3}	14	13	14.6	10	0.410
225/160	97 ^{±4}	20	14	20.5	14.6	0.90
315/225	137 ^{±4}	26	19	28.6	20.5	2.39



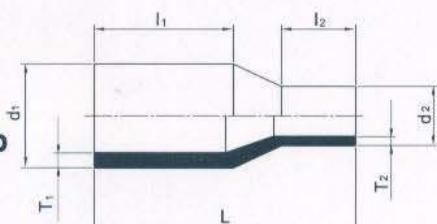
PIPE FITTING VALVE FLAN

PPH.HD

REDUCERS

concentric, elongated
for butt welding
molded from PPR/PE80/PE100

DFP 601



d_1/d_2 (mm)	l_1 (mm)	l_2 (mm)	L (mm)	PN6/ISO S-8.3/SDR 17.6		d_1/d_2 (mm)	l_1 (mm)	l_2 (mm)	L (mm)	PN16/ISO S-3.125/SDR 7.25	
				T_1/T_2 (mm)	Weight (Kg/Pc.)					T_1/T_2 (mm)	Weight (Kg/Pc.)
75/50	64 ± 1.5	58 ± 1.5	148 ± 2.5	4.3/2.9	0.13	110/63	83 ± 1.5	63 ± 1.5	181 ± 2.5	15.2/8.7	0.60
75/63	65 ± 1.5	58 ± 1.5	150 ± 2.5	4.3/3.6	0.13	110/90	80 ± 1.5	73 ± 1.5	181 ± 2.5	15.2/12.5	0.70
90/63	71 ± 1.5	60 ± 1.5	161 ± 2.5	5.1/3.6	0.20	125/63	91 ± 1.5	63 ± 1.5	193 ± 3	17.3/8.7	0.77
90/75	76 ± 1.5	63 ± 1.5	163 ± 2.5	5.1/4.3	0.21	125/90	90 ± 1.5	74 ± 1.5	191 ± 3	17.3/12.5	0.83
110/63	83 ± 1.5	58 ± 1.5	181 ± 2.5	6.3/3.6	0.30	125/110	90 ± 1.5	82 ± 1.5	201 ± 3	17.3/15.2	1.10
110/90	80 ± 1.5	73 ± 1.5	181 ± 2.5	6.3/5.1	0.34	160/90	103 ± 1.5	79 ± 1.5	221 ± 3	22.1/12.5	1.45
125/63	91 ± 2	63 ± 1.5	193 ± 3	7.1/3.6	0.38	160/110	98 ± 1.5	89 ± 1.5	225 ± 3	22.1/15.2	1.56
125/90	90 ± 2	74 ± 1.5	191 ± 3	7.1/5.1	0.42	160/125	98 ± 2	92 ± 2	231 ± 4	22.1/17.3	1.87
125/110	90 ± 2	82 ± 1.5	201 ± 3	7.1/6.3	0.48	200/160	112 ± 2	102 ± 2	252 ± 4	27.6/22.1	2.95
140/125	97 ± 2	94 ± 1.5	216 ± 4	8.0/7.1	0.70	225/160	128 ± 2	102 ± 2.5	270 ± 5	31.1/22.1	3.85
160/90	103 ± 2	79 ± 1.5	221 ± 4	9.1/5.1	0.74						
160/110	98 ± 2	89 ± 1.5	225 ± 4	9.1/6.3	0.82						
160/125	98 ± 2	92 ± 2	231 ± 4	9.1/7.1	0.84						
160/140	102 ± 2	97 ± 2	229 ± 4	9.1/8.0	0.93						
180/125	132 ± 2	97 ± 2	274 ± 4	10.2/7.1	1.24						
180/160	132 ± 2	104 ± 2	276 ± 4	10.2/9.1	1.40						
200/160	112 ± 2	100 ± 2	252 ± 4	11.4/9.1	1.45						
225/160	128 ± 2	102 ± 2.5	270 ± 5	12.8/9.1	1.95						

d_1/d_2 (mm)	l_1 (mm)	l_2 (mm)	L (mm)	PN10/ISO S-5/SDR 11	
				T_1/T_2 (mm)	Weight (Kg/Pc.)
25/20	40 ± 1.5	40 ± 1.5	86 ± 2.5	3.0/3.0	0.02
32/20	44 ± 1.5	40 ± 1.5	96 ± 2.5	3.0/3.0	0.03
32/25	45 ± 1.5	40 ± 1.5	96 ± 2.5	3.0/3.0	0.03
40/20	49 ± 1.5	40 ± 1.5	106 ± 2.5	3.7/3.0	0.04
40/25	49 ± 1.5	40 ± 1.5	105 ± 2.5	3.7/3.0	0.04
40/32	49 ± 1.5	40 ± 1.5	106 ± 2.5	3.7/3.0	0.05
50/25	57 ± 1.5	40 ± 1.5	121 ± 2.0	4.6/3.0	0.06
50/32	59 ± 1.5	46 ± 1.5	123 ± 2.5	4.6/3.0	0.07
50/40	57 ± 1.5	49 ± 1.5	127 ± 2.5	4.6/3.7	0.08
63/32	64 ± 1.5	48 ± 1.5	136 ± 2.5	5.8/3.0	0.10
63/40	61 ± 1.5	49 ± 1.5	131 ± 2.5	5.8/3.7	0.10
63/50	66 ± 1.5	61 ± 1.5	154 ± 2.5	5.8/4.6	0.14
75/50	64 ± 1.5	58 ± 1.5	149 ± 2.5	6.9/4.6	0.17
75/63	65 ± 1.5	58 ± 1.5	150 ± 2.5	6.9/5.8	0.20
90/63	71 ± 1.5	60 ± 1.5	161 ± 2.5	8.2/5.8	0.27
90/75	76 ± 1.5	63 ± 1.5	163 ± 2.5	8.2/6.9	0.30
110/63	83 ± 1.5	58 ± 1.5	181 ± 2.5	10.0/5.8	0.43
110/90	80 ± 1.5	73 ± 1.5	181 ± 2.5	10.0/8.2	0.50
125/63	91 ± 2	63 ± 1.5	193 ± 3	11.4/5.8	0.58
125/90	90 ± 2	74 ± 1.5	191 ± 3	11.4/8.2	0.64
125/110	90 ± 2	82 ± 1.5	201 ± 3	11.4/10.0	0.73
140/125	97 ± 2	94 ± 2	216 ± 4	12.8/11.4	0.98
160/90	103 ± 2	79 ± 2	221 ± 4	14.6/8.2	1.04
160/110	98 ± 2	89 ± 2	225 ± 4	14.6/10.0	1.18
160/125	98 ± 2	92 ± 2	231 ± 4	14.6/11.4	1.32
160/140	102 ± 2	97 ± 2	229 ± 4	14.6/12.8	1.35
180/125	132 ± 2	97 ± 2	274 ± 4	16.4/11.4	1.86
180/160	132 ± 2	104 ± 2	276 ± 4	16.4/14.6	2.08
200/160	112 ± 2	102 ± 2	252 ± 4	18.2/14.6	2.28
225/160	128 ± 2	102 ± 2	270 ± 4	20.5/14.6	2.92



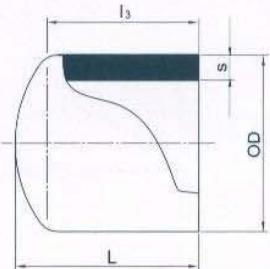
PIPE FITTING VALVE FLANGE

PPH.HD-PE

ENDCAPS

elongated,
for butt welding
molded from PPR/PE80/PE100

DFP 901



OD (mm)	I_3 (mm)	L (mm)	PN16/ISO S-3.125/SDR 7.25	
			S (mm)	Weight (Kg/Pc.)
30	-	-	-	-
40	-	-	-	-
50	-	-	-	-
63	-	-	-	-
75	-	-	-	-
90	84 ± 1.5	107 ± 1.5	12.5	0.50
110	94 ± 1.5	125 ± 1.5	15.2	0.53
125	103 ± 2	139 ± 2	17.3	0.72
160	110 ± 2	155 ± 2	22.1	1.40
200	117 ± 2	182 ± 2	27.6	2.64
225	142 ± 2.5	212 ± 2.5	31.1	3.58
250	157 ± 4	230 ± 4	34.5	5.20

OD (mm)	I_3 (mm)	L (mm)	PN6/ISO S-8.3/SDR 17.6	
			S (mm)	Weight (Kg/Pc.)
63	68 ± 1.5	84 ± 1.5	3.6	0.07
75	75 ± 1.5	93 ± 1.5	4.3	0.10
90	84 ± 1.5	107 ± 1.5	5.1	0.18
110	94 ± 1.5	125 ± 1.5	6.3	0.30
125	103 ± 2	139 ± 2	7.1	0.40
160	110 ± 2	155 ± 2	9.1	0.74
180	142 ± 2	192 ± 2	10.2	1.14
200	117 ± 2	182 ± 2	11.4	1.37
225	142 ± 2.5	212 ± 2.5	12.8	1.98
250	157 ± 3	230 ± 3	14.2	2.52
280	162 ± 3	257 ± 3	15.9	3.48
315	167 ± 3	267 ± 3	17.9	4.66

OD (mm)	I_3 (mm)	L (mm)	PN10/ISO S-5/SDR 11	
			S (mm)	Weight (Kg/Pc.)
20	41 ± 1.5	47 ± 1.5	3.0	0.01
25	41 ± 1.5	48 ± 1.5	3.5	0.01
32	47 ± 1.5	55 ± 1.5	3.5	0.02
40	51 ± 1.5	64 ± 1.5	4.0	0.03
50	60 ± 1.5	73 ± 1.5	5.2	0.06
63	68 ± 1.5	84 ± 1.5	6.3	0.10
75	75 ± 1.5	93 ± 1.5	7.5	0.15
90	84 ± 1.5	107 ± 1.5	9.2	0.26
110	94 ± 1.5	125 ± 1.5	11.8	0.44
125	103 ± 2	139 ± 2	13.0	0.62
160	110 ± 2	155 ± 2	15.0	1.06
180	142 ± 2	192 ± 2	16.4	1.70
200	117 ± 2	182 ± 2	20.0	2.02
225	142 ± 2.5	212 ± 2.5	20.5	3.00
250	157 ± 3	230 ± 3	22.8	3.82
280	162 ± 3	257 ± 3	25.5	5.30
315	167 ± 3	267 ± 3	28.7	7.20

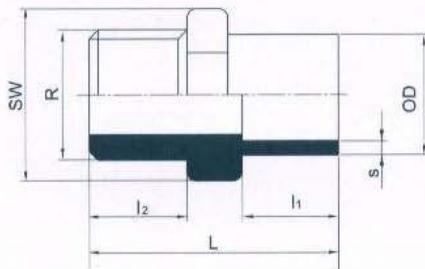


PIPE FITTING VALVE FLANGE

PPH.HD

ADAPTORS

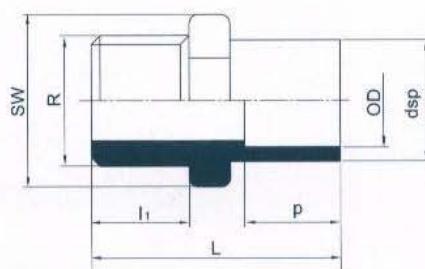
with male thread
for butt welding
molded from PPR/PE80/PE100
DFP 801



OD (mm)	S (mm)	$L \pm 2.5$ (mm)	$l_1 \pm 1.5$ (mm)	$l_2 \pm 1.5$ (mm)	SW ± 1.5 (mm)	PN 10/ISO S-5/SDR 11		
						"R" (inch)	NPT (inch)	Weight (kg/p.c.)
20	2.5	46	20	18	22	1/2"	1/2"	0.01
25	2.7	51	23	20	27	3/4"	3/4"	0.01
32	3.0	61.5	29	23	36	1"	1"	0.02
40	3.7	66.5	29	27	46	1 1/4"	1 1/4"	0.04
50	4.6	74.5	33	29	55	1 1/2"	1 1/2"	0.06
63	5.8	81	35	31	65	2"	2"	0.08

ADAPTORS

with male thread
for socket welding
molded from PPR/PE80/PE100
DFP 802



OD (mm)	$dsp \pm 1$ (mm)	$L \pm 1.5$ (mm)	P (mm)	$l_1 \pm 1$ (mm)	SW ± 1 (mm)	PN 10/ISO S-5/SDR 11		
						"R" (inch)	NPT* (inch)	Weight (kg/p.c.)
16	24.1	46	14.5	18	24	1/2"	1/2"	0.01
20	29.1	51	15.5	20	30	3/4"	3/4"	0.02
25	35.1	61.5	17.5	24	40	1"	1"	0.05
32	43.1	66.5	19.6	27	50.5	1 1/4"	1 1/4"	0.07
40	52.2	74.5	21.6	29	60.5	1 1/2"	1 1/2"	0.12
50	64.2	78.5	23.6	31	71.5	2"	2"	0.17



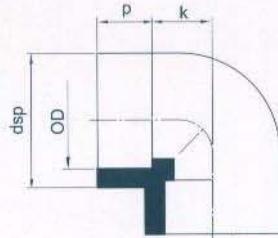
PIPE FITTING VALVE FLANGE

PPH.HD.

ELBOWS 90°

for socket welding
molded from PPR/PE80/PE100

DFP 304

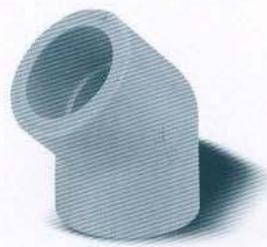
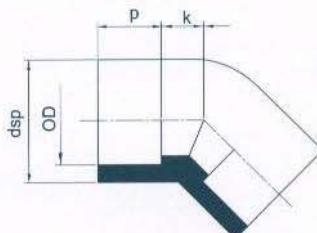


OD (mm)	dsp ^{±1} (mm)	k ^{±1} (mm)	P (mm)	PN10/ISO S-5/SDR 11
				Weight (Kg/Pc.)
16	24.0	10	14.5	0.01
20	29.1	15	15.5	0.02
25	35.1	15	17.5	0.03
32	43.1	21	19.6	0.04
40	52.2	25	21.6	0.07
50	64.2	30	23.6	0.12
63	81.3	35	28.1	0.22
75	92.3	39	32.6	0.30
90	113.3	44.5	36.6	0.57
110	133.4	54	42.6	0.80

ELBOWS 45°

for socket welding
molded from PPR/PE80/PE100

DFP 404



OD (mm)	dsp ^{±1} (mm)	k ^{±1} (mm)	P (mm)	PN10/ISO S-5/SDR 11
				Weight (Kg/Pc.)
16	24.1	4	14.5	0.01
20	29.1	5	15.5	0.02
25	35.1	6	17.5	0.02
32	43.1	7	19.6	0.04
40	52.2	9	21.6	0.06
50	64.2	11	23.6	0.09
63	81.3	16	28.1	0.17
75	92.3	16	32.6	0.22
90	113.3	19	36.6	0.41
110	133.4	27	42.6	0.59

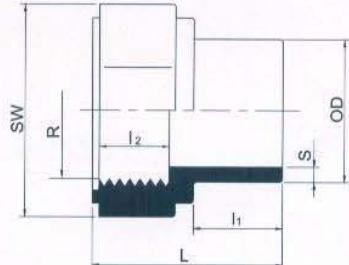


PIPE FITTING VALVE FLANGE

PPH.HD-PE

ADAPTORS

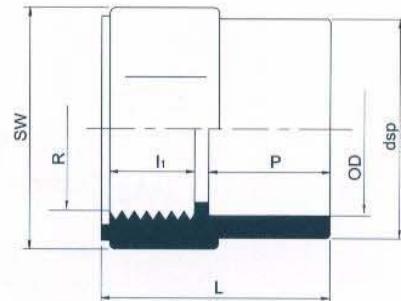
with female thread
for butt welding
molded from **PPR/PE80/PE100**
DFP 803



OD (mm)	s (mm)	L ^{±2.5} (mm)	l ₁ ^{±1.5} (mm)	l ₂ ^{±1.5} (mm)	SW (mm)	PN 10/ISO S-5/SDR 11		
						"R" (inch)	NPT (inch)	Weight (kg/pc.)
20	2.5	46.5	20	16	32	1/2"	1/2"	0.01
25	2.7	51.5	23	18	41	3/4"	3/4"	0.02
32	3.0	58.5	29	20	46	1"	1"	0.04
40	3.7	62.5	30	24	55	1 1/4"	1 1/4"	0.09
50	4.6	69	33.5	26.5	70	1 1/2"	1 1/2"	0.10
63	5.8	76	35.5	30.5	85	2"	2"	0.23

ADAPTORS

with female thread
for socket welding
molded from **PPR/PE80/PE100**
DFP 804



OD* (mm)	dsp ^{±1} (mm)	L ^{±2} (mm)	P (mm)	l ₂ ^{±1} (mm)	SW (mm)	PN 10/ISO S-5/SDR 11		
						"R" (inch)	NPT* (inch)	Weight (kg/pc.)
20	29.1	45	15.5	16	32	1/2"	1/2"	0.03
25	35.1	51	17.5	17	41	3/4"	3/4"	0.06
32	43.1	57.5	19.6	20	46	1"	1"	0.08
40	52.2	63	21.6	24	55	1 1/4"	1 1/4"	0.12
50	64.2	68.5	23.6	26	70	1 1/2"	1 1/2"	0.22
63	81.3	75	28.1	30	85	2"	2"	0.34

* On request, these fittings in OD 16–50mm(1/2"–2") are discontinued and only deliverable according to the available stock quantities.

Adaptors with NPT thread are only deliverable in PPR.



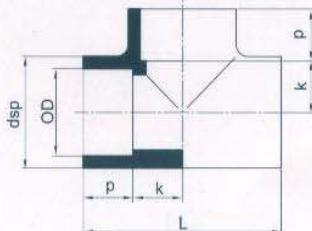
PIPE FITTING VALVE FLANGE

PPH.HD-PE

TEES

for socket welding
molded from **PPR/PE80/PE100**

DFP 202

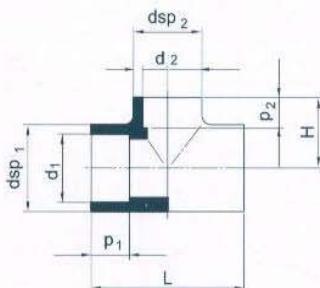


OD (mm)	dsp ^{±1} (mm)	L ^{±1} (mm)	k (mm)	p (mm)	PN10/ISO S-5/SDR 11	
					Weight (Kg/Pc.)	
16	24.1	54	12.5	14.5	0.02	
20	29.1	60	14.5	15.5	0.03	
25	35.1	68	16.5	17.5	0.04	
32	43.1	80	20.4	19.6	0.06	
40	52.2	94	25.4	21.6	0.10	
50	64.2	108	30.4	23.6	0.16	
63	81.3	125	34.4	28.1	0.30	
75	92.3	153	43.9	32.6	0.40	
90	113.3	183	54.9	36.6	0.81	
110	133.4	208	61.4	42.6	0.81	

TEES

for socket welding with reduced branch
molded from **PPR/PE80/PE100**

DFP 503



OD (mm)	dsp ₁ (mm)	dsp ₂ (mm)	P ₁ (mm)	P ₂ (mm)	L ^{±1} (mm)	H ^{±1} (mm)	PN10/ISO S-5/SDR 11	
							Weight (Kg/Pc.)	
25/20	35.1	29.1	17.5	15.5	68.5	32.0	0.04	
32/20	43.1	29.1	19.6	15.5	80.5	40.0	0.05	
32/25	43.1	35.1	19.6	17.5	80.5	40.0	0.06	
40/20	52.2	29.1	21.6	15.5	90.5	45.0	0.08	
40/25	52.2	35.1	21.6	17.5	90.5	45.5	0.08	
40/32	52.2	43.1	21.6	19.6	91.0	45.0	0.10	
50/20	64.2	29.1	23.6	15.5	110.5	52.5	0.16	
50/25	64.2	35.1	23.6	17.5	110.5	52.5	0.16	
50/32	64.2	43.1	23.6	19.6	107.0	52.5	0.17	
50/40	64.2	52.2	23.6	21.6	107.0	52.5	0.17	
63/25	81.3	35.1	28.1	17.5	128.6	65.0	0.27	
63/32	81.3	43.1	28.1	19.6	128.5	64.5	0.27	
63/40	81.3	52.2	28.1	21.6	128.6	64.5	0.28	
63/50	81.3	64.2	28.1	23.6	128.6	64.6	0.28	



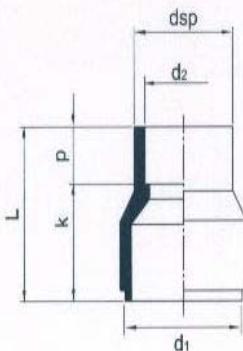
PIPE FITTING VALVE FLANGE

PPH.HD.

REDUCERS

for socket welding
molded from PPR/PE80/PE100

DFP 602



d ₁ , d ₂ (mm)	dsp ^{±1} (mm)	k ^{±1.5} (mm)	P (mm)	L ^{±2} (mm)	PN10/ISO S-5/SDR 11
					Weight (Kg/Pc.)
20/16	24.1	20.5	14.5	35	0.01
25/16	24.1	25.5	14.5	40	0.01
25/20	29.1	24.5	15.5	40	0.01
32/20	29.1	28.5	15.5	44	0.02
32/25	35.1	26.5	17.5	44	0.02
40/20	29.1	33.7	15.5	49.2	0.02
40/25	35.1	31.7	17.5	49.2	0.02
40/32	43.1	29.6	19.6	49.2	0.03
50/20	29.1	39.7	15.5	55.2	0.03
50/25	35.1	37.7	17.5	55.2	0.03
50/32	43.1	35.6	19.6	55.2	0.04
50/40	52.2	33.6	21.6	55.2	0.05
63/25	35.1	46.7	17.5	64.2	0.06
63/32	43.1	44.6	19.6	64.2	0.06
63/40	52.2	42.6	21.6	64.2	0.07
63/50	64.2	40.6	23.6	64.2	0.07
75/63	81.3	36.1	28.1	64.2	0.11
90/63	81.3	59.4	28.1	87.5	0.18
90/75	92.3	54.9	32.6	87.5	0.19
110/63	81.3	59.4	28.1	87.5	0.25
110/90	113.3	50.9	36.6	87.5	0.30



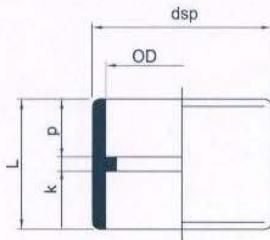
PIPE FITTING VALVE FLANGE

PPH.HD-PE

SOCKETS

for socket welding
molded from **PPR/PE80/PE100**

DFP 1101

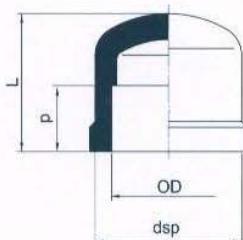


OD (mm)	dsp ^{±1} (mm)	k ^{±1.5} (mm)	P (mm)	L ^{±1.5} (mm)	PN10/ISO S-5/SDR 11	
					Weight (Kg/Pc.)	
16	24.1	4.0	14.5	33.0	0.01	
20	29.1	4.0	15.5	35.0	0.01	
25	35.1	4.0	17.5	39.0	0.02	
32	43.1	4.0	19.6	43.2	0.03	
40	52.2	4.0	21.6	47.2	0.04	
50	64.2	5.8	23.6	53.0	0.07	
63	81.3	5.3	28.1	61.5	0.12	
75	92.3	5.3	32.6	70.5	0.13	
90	113.3	6.3	36.6	79.5	0.30	
110	133.4	7.3	42.6	92.5	0.42	

END CAPS

for socket welding
molded from **PPR/PE80/PE100**

DFP 902



OD (mm)	dsp ^{±1.5} (mm)	L ^{±1.5} (mm)	P (mm)	PN10/ISO S-5/SDR 11	
				Weight (Kg/Pc.)	
16	24.1	25.0	14.5	0.01	
20	29.1	27.0	15.5	0.01	
25	35.1	30.0	17.5	0.01	
32	43.1	35.0	19.6	0.02	
40	52.2	39.0	21.6	0.03	
50	64.2	49.2	23.6	0.07	
63	81.3	59.2	28.1	0.13	
75	92.3	66.2	32.6	0.16	
90	113.3	77.2	36.6	0.25	
110	133.4	92.5	42.6	0.43	



PIPE FITTING VALVE FLANGE

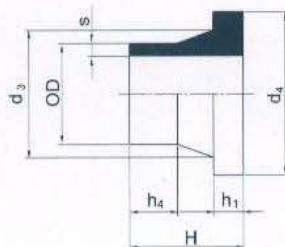
PPH.HD

STUB FLANGES

acc. DIN 16962/16963

molded from **PPR/PE80/PE100**

DFP 701



OD (mm)	PN3.2/ISO S-16/SDR 33							PN6/ISO S-83/SDR 17.6				
	d ₃ (mm)	d ₄ (mm)	d ₄ * (mm)	H ^{±2.0} (mm)	S (mm)	h ₁ (mm)	h ₄ * (mm)	Weight (kg/piece)	S (mm)	h ₁ (mm)	h ₄ * (mm)	Weight (kg/piece)
50	61	88	82.5	50	-	-	-	-	2.9	12	20	0.04
63	75	102	100.4	52	-	-	-	-	3.6	14	18	0.08
75	89	122	117.0	53	-	-	-	-	4.3	16	18	0.14
90	105	138	132.4	82	-	-	-	-	5.1	17	40	0.26
110	125	158	170.5	84	3.5	18	34	0.34	6.3	18	34	0.36
125	132	158	-	80	3.9	18	38	0.34	7.1	18	40	0.40
140	155	188	-	84	4.4	18	32	0.42	8.0	18	32	0.58
160	175	212	219.6	80	5.0	18	26	0.58	9.1	18	34	0.73
180	180	212	-	80	5.6	18	31	0.47	10.2	20	32	0.68
200	232	268	276.5	100	6.2	18	34	1.08	11.4	24	37	1.48
225	235	268	337.0	100	7.0	18	46	0.90	12.8	24	42	1.34
250	285	320	-	100	7.8	20	40	1.56	14.2	25	33	2.16
280	291	320	-	100	8.7	20	37	1.30	15.9	25	38	1.98
315	335	370	406.0	100	9.8	20	35	1.90	17.9	25	35	2.70
355	373	430	-	120	11.1	23	30	2.58	20.1	30	30	3.66
400	427	482	-	120	12.4	26	49	3.69	22.7	33	42	5.15
450	514	585	-	120	14.0	33	27	6.42	25.5	46	14	9.07
500	530	585	-	120	15.5	33	37	5.47	28.3	46	24	7.87
560	615	685	-	120	17.4	35	25	9.10	31.7	50	20	12.31
630	642	685	-	120	19.6	35	45	6.24	35.7	50	30	10.52

*d4-measurements according to ANSI standard.

These stub flanges up to OD315 mm(12") with other d4-measurements for flanges acc. to ANSI standard and JIS standard can be provided on request.



PIPE FITTING VALVE FLANGE

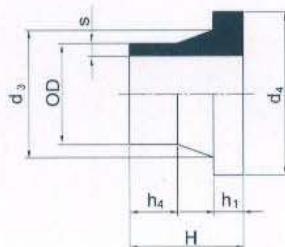
PPH.HD

STUB FLANGES

acc. DIN 16962/16963

molded from **PPR/PE80/PE100**

DFP 701



OD (mm)	PN3.2/ISO S-16/SDR 33							PN6/ISO S-83/SDR 17.6				
	d ₃ (mm)	d ₄ (mm)	d ₄ * (mm)	H ^{±2.0} (mm)	S (mm)	h ₁ (mm)	h ₄ * (mm)	Weight (kg/piece)	S (mm)	h ₁ (mm)	h ₄ * (mm)	Weight (kg/piece)
50	61	88	82.5	50	-	-	-	-	2.9	12	20	0.04
63	75	102	100.4	52	-	-	-	-	3.6	14	18	0.08
75	89	122	117.0	53	-	-	-	-	4.3	16	18	0.14
90	105	138	132.4	82	-	-	-	-	5.1	17	40	0.26
110	125	158	170.5	84	3.5	18	34	0.34	6.3	18	34	0.36
125	132	158	-	80	3.9	18	38	0.34	7.1	18	40	0.40
140	155	188	-	84	4.4	18	32	0.42	8.0	18	32	0.58
160	175	212	219.6	80	5.0	18	26	0.58	9.1	18	34	0.73
180	180	212	-	80	5.6	18	31	0.47	10.2	20	32	0.68
200	232	268	276.5	100	6.2	18	34	1.08	11.4	24	37	1.48
225	235	268	337.0	100	7.0	18	46	0.90	12.8	24	42	1.34
250	285	320	-	100	7.8	20	40	1.56	14.2	25	33	2.16
280	291	320	-	100	8.7	20	37	1.30	15.9	25	38	1.98
315	335	370	406.0	100	9.8	20	35	1.90	17.9	25	35	2.70
355	373	430	-	120	11.1	23	30	2.58	20.1	30	30	3.66
400	427	482	-	120	12.4	26	49	3.69	22.7	33	42	5.15
450	514	585	-	120	14.0	33	27	6.42	25.5	46	14	9.07
500	530	585	-	120	15.5	33	37	5.47	28.3	46	24	7.87
560	615	685	-	120	17.4	35	25	9.10	31.7	50	20	12.31
630	642	685	-	120	19.6	35	45	6.24	35.7	50	30	10.52

*d4-measurements according to ANSI standard.

These stub flanges up to OD315 mm(12") with other d4-measurements for flanges acc. to ANSI standard and JIS standard can be provided on request.



PIPE FITTING VALVE FLANGE

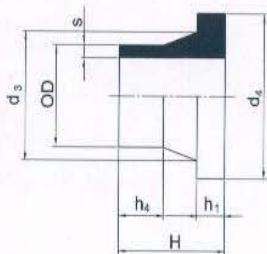
PPH.HD-PE

STUB FLANGES

acc. DIN 16962/16963

molded from **PPR/PE80/PE100**

DFP 701



OD (mm)	d _s (mm)	d ₄ (mm)	d ₄ [*] (mm)	H ^{±2,5} (mm)	PN10/ISO S-5/SDR 11			
					s (mm)	h ₁ (mm)	h ₄ (mm)	Weight (kg/pc.)
20	27	45	44,5	50	2,5	7	30 ^{±2}	0,02
25	33	58	54,1	50	2,7	9	25 ^{±2}	0,04
32	40	68	63,5	50	3,0	10	18 ^{±2}	0,06
40	50	78	71,5	50	3,7	11	20 ^{±2}	0,06
50	61	88	82,5	50	4,6	12	18 ^{±2}	0,08
63	75	102	100,4	52	5,8	14	18 ^{±2}	0,12
75	89	122	117,0	53	6,9	16	18 ^{±2}	0,20
90	105	138	132,4	82	8,2	17	40 ^{±3}	0,36
110	125	158	170,5	84	10,0	18	38 ^{±3}	0,48
125	132	158	-	80	11,4	25	32 ^{±3}	0,54
140	155	188	-	84	12,8	25	30 ^{±3}	0,80
160	175	212	219,6	80	14,6	25	30 ^{±3}	1,00
180	180	212	-	80	16,4	30	24 ^{±3}	0,96
200	232	268	276,5	100	18,2	32	28 ^{±4}	2,05
225	235	268	-	100	20,5	32	38 ^{±4}	1,96
250	285	320	337,0	100	22,8	35	27 ^{±4}	3,00
280	291	320	-	100	25,5	35	35 ^{±4}	2,80
315	335	370	406,0	100	28,7	35	30 ^{±4}	3,76
355	373	430	-	120	32,3	40	32 ^{±4}	5,32
400	427	482	-	120	36,4	46	49 ^{±4}	7,75
450	514	585	-	120	41,0	60	27 ^{±4}	12,55
500	530	585	-	120	45,5	60	37 ^{±4}	11,78

*d4-measurements according to ANSI standard.

These stub flanges up to OD315 mm(12") with other d4-measurements for flanges acc. to ANSI standard and JIS standard can be provided on request.

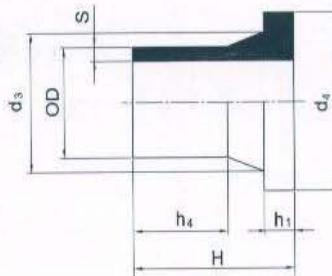


PIPE FITTING VALVE FLANGE

PPH.HD-

STUB FLANGES

elongated
out of PPR/PE80/PE100
DFP 702



OD (mm)	d_3 (mm)	d_4 (mm)	H (mm)	h_4 (mm)	PN6/ISO S-8.3/SDR 17.6			PN10/ISO S-5/SDR 11		
					S (mm)	h_1 (mm)	Weight (kg/pc.)	S (mm)	h_1 (mm)	Weight (kg/pc.)
20	26	45	91 ± 1.5	86 ± 1.5	-	-	-	3.0	7	0.03
25	33	58	86 ± 1.5	64 ± 1.5	-	-	-	3.0	9	0.05
32	40	68	86 ± 1.5	61 ± 1.5	-	-	-	3.0	10	0.06
40	50	78	86 ± 1.5	65 ± 1.5	-	-	-	3.7	11	0.09
50	61	88	86 ± 1.5	69 ± 1.5	-	-	-	4.6	12	0.12
63	75	102	121 ± 1.5	78 ± 1.5	3.6	14	0.19	5.8	14	0.22
75	89	122	126 ± 1.5	89 ± 1.5	4.3	16	0.23	6.9	16	0.31
90	105	138	139 ± 1.5	101 ± 1.5	5.1	17	0.40	8.2	17	0.48
110	125	158	161 ± 1.5	101 ± 1.5	6.3	18	0.51	10.0	18	0.65
125	132	158	172 ± 2	122 ± 2	7.1	18	0.65	11.4	25	0.98
160	175	212	202 ± 2	127 ± 2	9.1	18	1.17	14.6	25	1.72
180	180	212	202 ± 2	127 ± 2	10.2	20	1.18	16.4	30	1.88
200	232	268	202 ± 2	118 ± 2	11.4	24	2.04	18.2	32	2.93
225	235	268	202 ± 2	130 ± 2.5	12.8	24	2.12	20.5	32	3.02
250	285	320	275 ± 4	202 ± 4	14.2	25	4.00	22.8	35	5.76
280	291	320	377 ± 4	302 ± 4	15.9	25	5.56	25.5	35	8.40
315	335	370	382 ± 4	302 ± 4	17.9	25	7.20	28.7	35	11.20



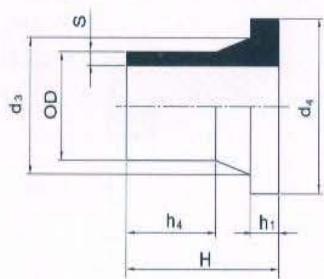
PIPE FITTING VALVE FLANGE

PPH.HD-PE

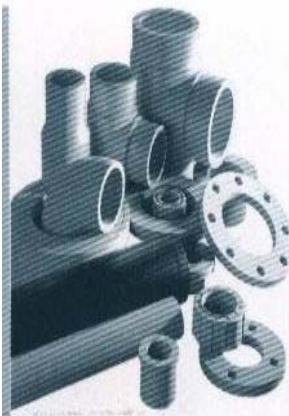
STUB FLANGES

elongated
out of PPR/PE80/PE100

DFP 702



OD (mm)	d_s (mm)	d_4 (mm)	H (mm)	h_4 (mm)	PN16/ISO S-3.125/SDR 7.25		
					S (mm)	h_1 (mm)	Weight (kg/pc.)
32	40	68	$86^{\pm 1.5}$	$61^{\pm 1.5}$	4.5	10	0.07
40	50	78	$101^{\pm 1.5}$	$61^{\pm 1.5}$	5.6	11	0.11
50	61	88	$101^{\pm 1.5}$	$68^{\pm 1.5}$	6.9	12	0.16
63	75	102	$121^{\pm 1.5}$	$78^{\pm 1.5}$	8.7	16	0.27
75	89	122	$128^{\pm 1.5}$	$85^{\pm 1.5}$	10.4	16	0.40
90	105	138	$143^{\pm 1.5}$	$95^{\pm 1.5}$	12.5	17	0.65
110	125	158	$143^{\pm 1.5}$	$97^{\pm 1.5}$	15.2	18	0.92
125	132	158	$184^{\pm 2}$	$122^{\pm 2}$	17.3	25	1.33
160	175	212	$182^{\pm 2}$	$120^{\pm 2}$	22.1	25	2.21
200	232	268	$181^{\pm 2}$	$122^{\pm 2}$	27.6	32	3.58
225	235	268	$183^{\pm 2.5}$	$128^{\pm 2.5}$	31.1	32	3.95
250	285	320	$276^{\pm 4}$	$198^{\pm 4}$	34.5	35	7.61



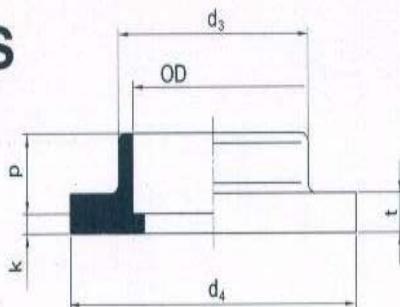
PIPE FITTING VALVE FLAN

PPH.HD

FLANGE ADAPTORS

for socket welding
molded from PPR/PE80/PE100

DFP 703



OD (mm)	$d_3^{\pm 1}$ (mm)	d_4 (mm)	t (mm)	$k^{\pm 1}$ (mm)	P (mm)	PN10/ISO S-5/SDR 11
						Weight (Kg/Pc.)
16	27	45	8	5	13.0	0.01
20	27	45	10	5	14.50	0.01
25	33	58	10	5	16.0	0.02
32	41	67.7	10	5	19.0	0.04
40	50	77.1	10.5	5	22.6	0.05
50	61	87.6	13	5	23.5	0.07
63	76	101.4	13.7	5	28.6	0.09
75	91	121.3	17	5	30.6	0.15
90	109	138	16.3	5	35.3	0.31
110	131	158	18	5	41.5	0.40



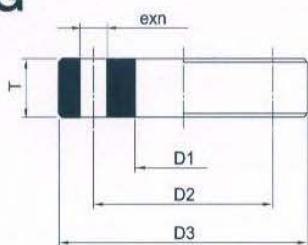
PIPE FITTING VALVE FLANGE

PPH.HD-PE

PP BACKING RING

with steel insert
molded from PP grey

DFP 704



OD (mm)	DN (mm)	D1			D2			D3			T	e			n		
		JIS	ANSI	DIN	JIS	ANSI	DIN	JIS	ANSI	DIN		JIS	ANSI	DIN	JIS	ANSI	DIN
20	15	28 ^{±1.5}	28 ^{±1.5}	28 ^{±1.5}	70 ^{±0.5}	60 ^{±0.5}	65	95 ^{±1.0}	89 ^{±1.0}	95	14 ^{±1.0}	15	16	14	4	4	4
25	20	34 ^{±1.5}	34 ^{±1.5}	34 ^{±1.5}	75 ^{±0.5}	70 ^{±0.5}	75	100 ^{±1.0}	98 ^{±1.0}	105	14 ^{±1.0}	15	16	14	4	4	4
32	25	42 ^{±1.5}	42 ^{±1.5}	42 ^{±1.5}	90 ^{±0.5}	79 ^{±0.5}	85	125 ^{±1.0}	108 ^{±1.0}	115	18 ^{±1.0}	19	16	14	4	4	4
40	32	51 ^{±1.5}	51 ^{±1.5}	51 ^{±1.5}	100 ^{±0.5}	89 ^{±0.5}	100	135 ^{±1.0}	117 ^{±1.0}	140	18 ^{±1.0}	19	16	18	4	4	4
50	40	62 ^{±1.5}	62 ^{±1.5}	62 ^{±1.5}	105 ^{±0.5}	98 ^{±0.5}	110	140 ^{±1.0}	127 ^{±1.0}	150	19 ^{±1.0}	19	16	18	4	4	4
63	50	78 ^{±1.5}	78 ^{±1.5}	78 ^{±1.5}	120 ^{±1.5}	121 ^{±1.5}	125	155 ^{±1.0}	152 ^{±1.0}	165	19 ^{±1.0}	19	19	18	4	4	4
75	65	92 ^{±1.5}	92 ^{±1.5}	92 ^{±1.5}	140 ^{±1.0}	140 ^{±1.0}	145	175 ^{±1.5}	178 ^{±1.5}	185	19 ^{±1.0}	19	19	18	4	4	4
90	80	108 ^{±1.5}	108 ^{±1.5}	108 ^{±1.5}	150 ^{±1.0}	152 ^{±1.0}	160	185 ^{±1.5}	191 ^{±1.5}	200	23 ^{±1.0}	19	19	18	8	4	8
110	100	128 ^{±1.5}	128 ^{±1.5}	128 ^{±1.5}	175 ^{±1.0}	191 ^{±1.0}	180	210 ^{±1.5}	229 ^{±1.5}	220	23 ^{±1.0}	19	19	18	8	8	8
125	100	135 ^{±1.5}	135 ^{±1.5}	135 ^{±1.5}	175 ^{±1.0}	191 ^{±1.0}	180	210 ^{±1.5}	229 ^{±1.5}	220	23 ^{±1.0}	19	19	18	8	8	8
140	125	158 ^{±1.5}	158 ^{±1.5}	158 ^{±1.5}	210 ^{±1.25}	216 ^{±1.25}	210	250 ^{±1.5}	254 ^{±1.5}	250	23 ^{±1.0}	23	22	18	8	8	8
160	150	178 ^{±1.5}	178 ^{±1.5}	178 ^{±1.5}	240 ^{±1.25}	241 ^{±1.25}	240	280 ^{±1.5}	279 ^{±1.5}	285	23 ^{±1.0}	23	22	23	8	8	8
180	150	188 ^{±1.5}	188 ^{±1.5}	188 ^{±1.5}	240 ^{±1.25}	241 ^{±1.25}	240	280 ^{±1.5}	279 ^{±1.5}	285	23 ^{±1.0}	23	22	23	8	8	8
200	200	235 ^{±1.5}	235 ^{±1.5}	235 ^{±1.5}	290 ^{±1.25}	298 ^{±1.25}	295	330 ^{±1.5}	343 ^{±1.5}	340	23 ^{±1.0}	23	22	23	12	8	8
225	200	238 ^{±1.5}	238 ^{±1.5}	238 ^{±1.5}	290 ^{±1.25}	298 ^{±1.25}	295	330 ^{±1.5}	343 ^{±1.5}	340	23 ^{±1.0}	23	22	23	12	8	8
250	250	288 ^{±1.5}	288 ^{±1.5}	288 ^{±1.5}	355 ^{±1.25}	362 ^{±1.25}	350	400 ^{±2.0}	406 ^{±2.0}	395	21 ^{±1.0}	25	25	23	12	12	12
280	250	294 ^{±1.5}	294 ^{±1.5}	294 ^{±1.5}	355 ^{±1.25}	362 ^{±1.25}	350	400 ^{±2.0}	406 ^{±2.0}	395	21 ^{±1.0}	25	25	23	12	12	12
315	300	338 ^{±1.5}	338 ^{±1.5}	338 ^{±1.5}	400 ^{±1.25}	432 ^{±1.25}	400	445 ^{±2.0}	483 ^{±2.0}	483	21 ^{±1.0}	25	25	25	16	12	12
355	350	376 ^{±1.5}	376 ^{±1.5}	376 ^{±1.5}	445 ^{±1.25}	476 ^{±1.25}	460	490 ^{±2.0}	533 ^{±2.0}	520	28 ^{±2.0}	25	29	25	16	12	16
400	400	430 ^{±1.5}	430 ^{±1.5}	430 ^{±1.5}	510 ^{±1.25}	540 ^{±1.5}	510	560 ^{±2.0}	597 ^{±2.0}	600	28 ^{±2.0}	27	29	27	16	16	16
450	500	517 ^{±1.5}	517 ^{±1.5}	517 ^{±1.5}	565 ^{±1.5}	578 ^{±1.5}	620	620 ^{±2.0}	635 ^{±2.0}	711	28 ^{±2.0}	27	32	27	20	20	20
500	500	533 ^{±1.5}	533 ^{±1.5}	533 ^{±1.5}	620 ^{±1.5}	635 ^{±1.5}	620	675 ^{±2.0}	699 ^{±2.0}	711	28 ^{±2.0}	27	32	27	20	20	20
560	600	618 ^{±1.5}	618 ^{±1.5}	618 ^{±1.5}	730 ^{±1.5}	749 ^{±1.5}	725	795 ^{±2.0}	813 ^{±2.0}	813	28 ^{±2.0}	33	35	30	24	20	20
630	600	645 ^{±1.5}	645 ^{±1.5}	645 ^{±1.5}	730 ^{±1.5}	749 ^{±1.5}	725	795 ^{±2.0}	813 ^{±2.0}	813	28 ^{±2.0}	33	35	30	24	20	20

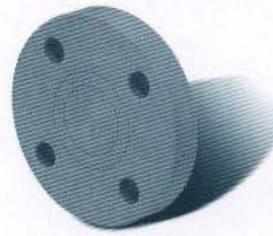
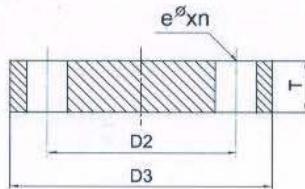


PIPE FITTING VALVE FLANGE

PPH.HI

BLIND FLANGES

PP grey
PE 100 black
DFP 705



OD (mm)	DN (mm)	D2			D3			T	e			n		
		JIS	ANSI	DIN	JIS	ANSI	DIN		JIS	ANSI	DIN	JIS	ANSI	DIN
20	15	70 ^{±0.5}	60 ^{±0.5}	65	95 ^{±1.0}	89 ^{±1.0}	95	14 ^{±1.0}	15	16	14	4	4	4
25	20	75 ^{±0.5}	70 ^{±0.5}	75	100 ^{±1.0}	98 ^{±1.0}	105	14 ^{±1.0}	15	16	14	4	4	4
32	25	90 ^{±0.5}	79 ^{±0.5}	85	125 ^{±1.0}	108 ^{±1.0}	115	18 ^{±1.0}	19	16	14	4	4	4
40	32	100 ^{±0.5}	89 ^{±0.5}	100	135 ^{±1.0}	117 ^{±1.0}	140	18 ^{±1.0}	19	16	18	4	4	4
50	40	105 ^{±0.5}	98 ^{±0.5}	110	140 ^{±1.0}	127 ^{±1.0}	150	19 ^{±1.0}	19	16	18	4	4	4
63	50	120 ^{±1.5}	121 ^{±1.5}	125	155 ^{±1.0}	152 ^{±1.0}	165	19 ^{±1.0}	19	19	18	4	4	4
75	65	140 ^{±1.0}	140 ^{±1.0}	145	175 ^{±1.5}	178 ^{±1.5}	185	19 ^{±1.0}	19	19	18	4	4	4
90	80	150 ^{±1.0}	152 ^{±1.0}	160	185 ^{±1.5}	191 ^{±1.5}	200	23 ^{±1.0}	19	19	18	8	4	8
110	100	175 ^{±1.0}	191 ^{±1.0}	180	210 ^{±1.5}	229 ^{±1.5}	220	23 ^{±1.0}	19	19	18	8	8	8
125	100	175 ^{±1.0}	191 ^{±1.0}	180	210 ^{±1.5}	229 ^{±1.5}	220	23 ^{±1.0}	19	19	18	8	8	8
140	125	210 ^{±1.25}	216 ^{±1.25}	210	250 ^{±1.5}	254 ^{±1.5}	250	23 ^{±1.0}	23	22	18	8	8	8
160	150	240 ^{±1.25}	241 ^{±1.25}	240	280 ^{±1.5}	279 ^{±1.5}	285	23 ^{±1.0}	23	22	23	8	8	8
180	150	240 ^{±1.25}	241 ^{±1.25}	240	280 ^{±1.5}	279 ^{±1.5}	285	23 ^{±1.0}	23	22	23	8	8	8
200	200	290 ^{±1.25}	298 ^{±1.25}	295	330 ^{±1.5}	343 ^{±1.5}	340	23 ^{±1.0}	23	22	23	12	8	8
225	200	290 ^{±1.25}	298 ^{±1.25}	295	330 ^{±1.5}	343 ^{±1.5}	340	23 ^{±1.0}	23	22	23	12	8	8
250	250	355 ^{±1.25}	362 ^{±1.25}	350	400 ^{±2.0}	406 ^{±1.5}	395	21 ^{±1.0}	25	25	23	12	12	12
280	250	355 ^{±1.25}	362 ^{±1.25}	350	400 ^{±2.0}	406 ^{±2.0}	395	21 ^{±1.0}	25	25	23	12	12	12
315	300	400 ^{±1.25}	432 ^{±1.25}	400	445 ^{±2.0}	483 ^{±2.0}	483	21 ^{±1.0}	25	25	25	16	12	12
355	350	445 ^{±1.25}	476 ^{±1.25}	460	490 ^{±2.0}	533 ^{±2.0}	520	28 ^{±2.0}	25	29	25	16	12	16
400	400	510 ^{±1.25}	540 ^{±1.5}	510	560 ^{±2.0}	597 ^{±2.0}	600	28 ^{±2.0}	27	29	27	16	16	16
450	500	565 ^{±1.5}	578 ^{±1.5}	620	620 ^{±2.0}	635 ^{±2.0}	711	28 ^{±2.0}	27	32	27	20	20	20
500	500	620 ^{±1.5}	635 ^{±1.5}	620	675 ^{±2.0}	699 ^{±2.0}	711	28 ^{±2.0}	27	32	27	20	20	20
560	600	730 ^{±1.5}	749 ^{±1.5}	725	795 ^{±2.0}	813 ^{±2.0}	813	28 ^{±2.0}	33	35	30	24	20	20
630	600	730 ^{±1.5}	749 ^{±1.5}	725	795 ^{±2.0}	813 ^{±2.0}	813	28 ^{±2.0}	33	35	30	24	20	20

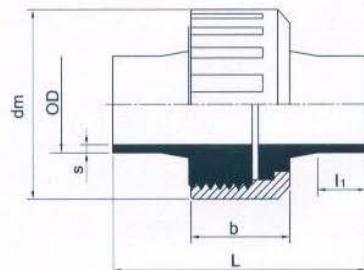


PIPE FITTING VALVE FLANGE

PPH.HD-PE

UNIONS

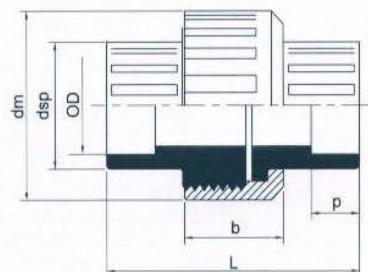
for butt welding
with EPDM O-Ring gasket
with FPM O-Ring gasket
molded from **PPR/PE80/PE100**



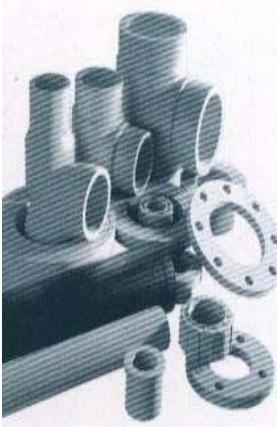
OD (mm)	s (mm)	$L \pm 2.5$ (mm)	h (mm)	$d_m \pm 1.5$ (mm)	$b \pm 1.5$ (mm)
20	2.5	104	30	47	24
25	2.7	101	25	60	27
32	3.0	104.5	18	70	28.5
40	3.7	100	20	81	30
50	4.6	103	18	87	33
63	5.8	116	18	100	40
75	6.9	104	18	146	48
90	8.2	168	40	180	64
110	10	174	38	194	78

UNIONS

for socket welding
with EPDM O-Ring gasket
with FPM O-Ring gasket
molded from **PPR/PE80/PE100**



OD (mm)	dsp (mm)	$L \pm 2.5$ (mm)	p (mm)	$d_m \pm 1.5$ (mm)	$b \pm 1.5$ (mm)	Weight (Kg/Pc)
20	31	57	15	47	24	0.040
25	36	64	20	60	27	0.077
32	45	69	20	70	28.5	0.103
40	51.5	81	25	81	30	0.147
50	61	91	24	87	33	0.172
63	73	101	27	100	40	0.238
75	94	114	31	146	48	0.668
90	111	134	35	180	64	1.221
110	135	153	45	194	78	1.657

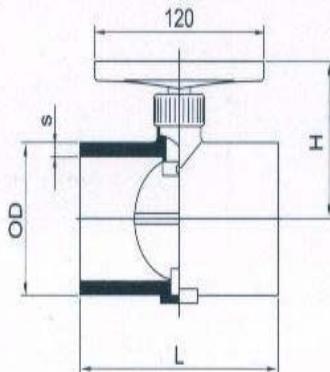


PIPE FITTING VALVE FLANGE

PPH.HD

THROTTLE VALVES

elongated,
molded from PPR



OD (mm)	$\frac{1}{3}$ (mm)	z (mm)	A	PN6/ISO S-8.3/SDR 17.6	
				S (mm)	Weight (Kg/Pc.)
75	95	88	126	4.3	0.10
90	110	95	126	5.1	0.18
110	130	105	126	4.3	0.25
140	153	120	152	5.4	0.45
160	176	130	152	6.2	0.63
200	195	150	190	7.7	1.26

The throttle valve is fitted with a 90° stop for the closed position and can be fixed at any position.

The throttle valve is only suitable for non pressure piping.



PIPE FITTING VALVE FLANGE

PPH.HD-PE

ROUND BARS

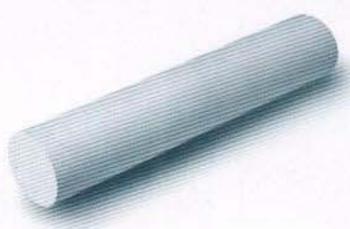
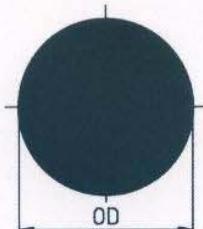
out of **PP** and **PE 80**

acc. to DIN 16980

Storage length: 1m

(Special lengths on request)

DFP 104

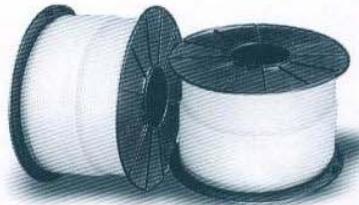
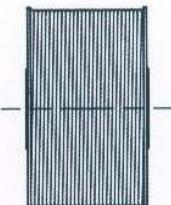


OD (mm)	Tolerance		Material	
	Minimum [mm]	Maximum [mm]	PP Weight* [kg/m]	PE 80 Weight* [kg/m]
10	+0,1	+0,6	0,076	0,080
12	+0,1	+0,6	0,103	0,110
15	+0,2	+0,7	0,177	0,185
16	+0,2	+0,8	0,195	0,203
20	+0,2	+1,0	0,303	0,317
25	+0,2	+1,1	0,470	0,491
30	+0,2	+1,2	0,674	0,703
35	+0,2	+1,3	0,931	0,971
40	+0,2	+1,5	1,19	1,24
45	+0,3	+1,7	1,51	1,57
50	+0,3	+2,0	1,87	1,95
55	+0,3	+2,1	2,26	2,36
60	+0,3	+2,3	2,69	2,80
70	+0,3	+2,5	3,64	3,80
75	+0,3	+2,5	4,19	4,35

OD (mm)	Tolerance		Material	
	Minimum [mm]	Maximum [mm]	PP Weight* [kg/m]	PE 80 Weight* [kg/m]
80	+0,4	+2,5	4,74	4,94
90	+0,5	+2,8	5,99	6,26
100	+0,6	+3,0	7,40	7,73
110	+0,7	+3,0	8,94	9,33
125	+0,8	+3,5	11,6	12,1
135	+0,8	+3,5	13,9	14,4
140	+0,9	+4,0	14,5	15,1
150	+1,0	+4,2	16,6	17,4
160	+1,1	+4,5	18,9	19,8
180	+1,2	+5,0	23,9	25,0
200	+1,3	+5,5	30,0	31,3
220	+1,3	+5,5	36,1	37,7
250	+1,3	+6,0	46,5	48,6
300	+1,3	+7,0	66,7	69,7
315	+1,3	+8,0	70,9	74,3

* Theoretical weight, the effective weight will be invoiced.

WELDING RODS



Cross section and dimension [mm]	PP grey	PP natural	PE80 black	PELD black	PELD natural
	●	●	●	●	○
2	●	●	—	—	—
3	●	●	●	●	○
4	●	●	●	●	○
5	●	●	●	—	—
7x5	○	○	○	○	○
6x4	○	○	○	○	○
4,8x3,4	○	○	○	○	○
5,2x3,8	○	○	○	○	○
5,2x3,2	○	○	○	○	○

● on stock ○ on request — not available

Available in drums of approx. 3kg