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Forged & Outlet Fittings

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R&G FLUID POWER GROUP

FORGED STEEL FITTINGS

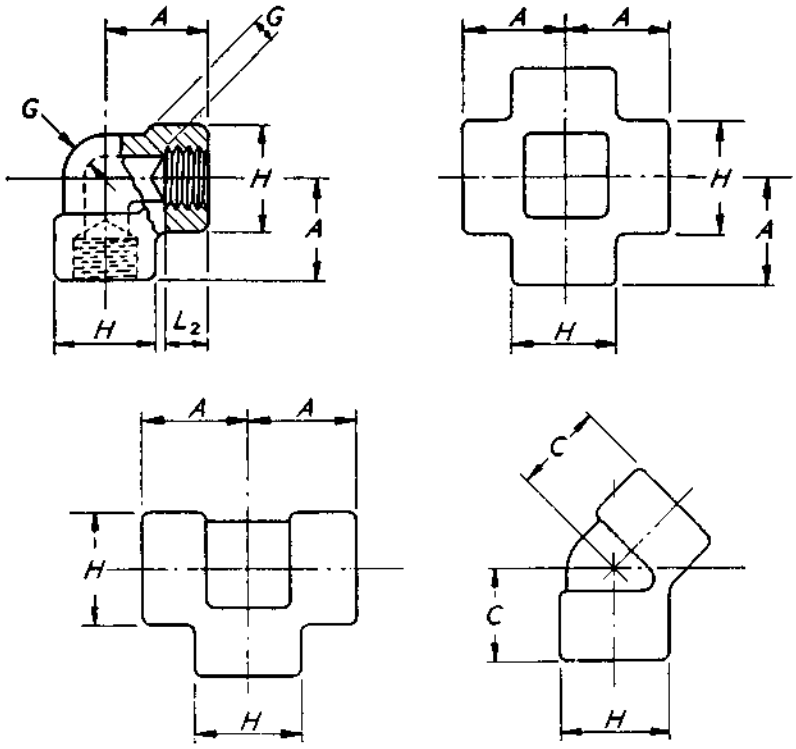
BS 3799 & ANSI B16.11

Screwed Fittings 3000 lb & 6000 lb

Socket Weld Fittings 3000 lb & 6000 lb

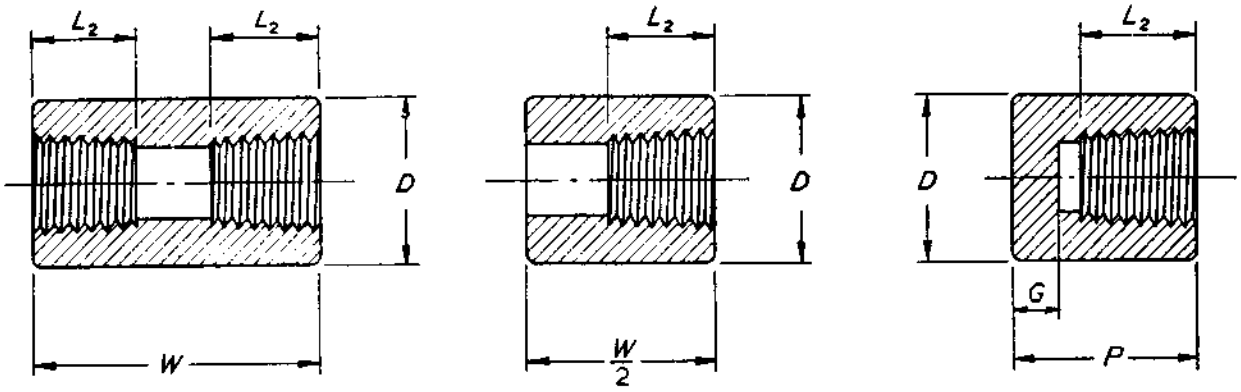
Tolerances

Weights



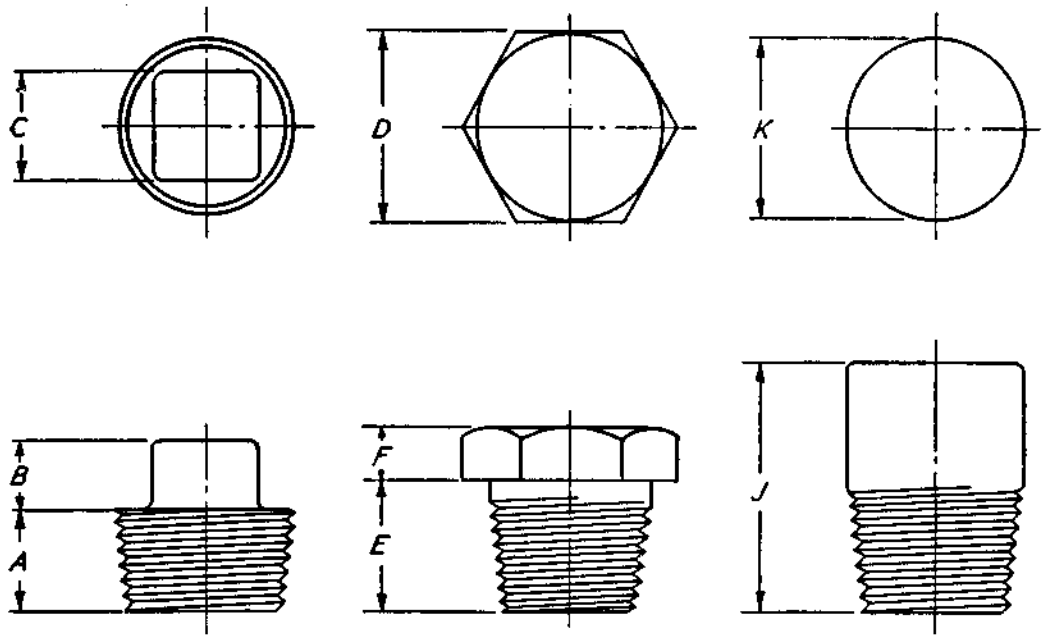
Screwed fittings. Dimensions of 90 ° elbows, crosses, tees and 45 ° elbows

Nominal size		Centre-to-end 90 ° elbows, tees, crosses *A*		Centre-to-end 45 ° elbows *C*		Outside diameter of band (min.) *H*		Wall thickness (min.) *G*		Length of thread (min.)
		3000	6000	3000	6000	3000	6000	3000	6000	L_5
in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
⅛	(6)	21	—	17	—	22	—	3.2	—	6.70
¼	(8)	25	—	19	—	25	—	3.3	—	10.21
⅜	(10)	29	—	22	—	33	—	3.5	—	10.36
½	(15)	33	38	25	29	38	46	4.1	8.2	13.56
¾	(20)	38	44	29	33	46	56	4.3	8.5	13.86
1	(25)	44	51	33	35	56	62	5.0	9.9	17.34
1¼	(32)	51	60	35	43	62	75	5.3	10.6	17.95
1½	(40)	60	64	43	44	75	84	5.5	11.1	18.38
2	(50)	64	83	44	52	84	102	6.0	12.0	19.22
2½	(65)	83	95	52	—	102	121	7.6	15.3	28.89
3	(80)	95	114	64	—	121	146	8.3	16.6	30.48
4	(100)	114	—	79	—	152	—	9.3	—	33.02



Screwed fittings. Dimensions of couplings, half-couplings and caps

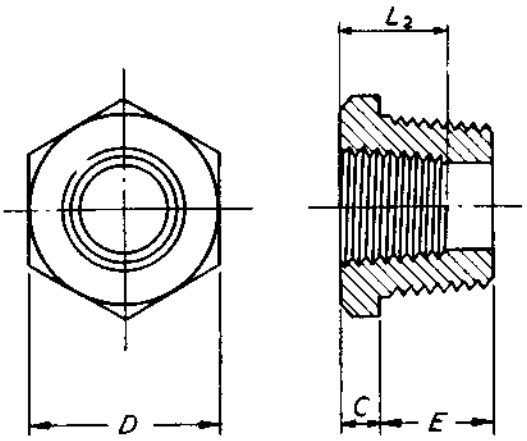
Nominal size		End to end couplings *W*	End to end caps *P*		Outside diameter (min.) *D*		Cap end wall thickness (min.) *G*		Length of thread (min.)
		3000 and 6000	3000	6000	3000	6000	3000	6000	L_1
in	mm	mm	mm	mm	mm	mm	mm	mm	mm
$\frac{1}{8}$	(6)	32	19	—	16	22	5	—	6.70
$\frac{1}{4}$	(8)	35	25	27	19	25	5	6	10.21
$\frac{3}{8}$	(10)	38	25	27	22	32	5	6	10.36
$\frac{1}{2}$	(15)	48	32	33	29	38	6	8	13.56
$\frac{3}{4}$	(20)	51	37	38	35	45	6	8	13.86
1	(25)	60	41	43	45	57	10	11	17.34
$1\frac{1}{4}$	(32)	67	45	46	57	64	10	11	17.95
$1\frac{1}{2}$	(40)	79	45	48	64	76	11	13	18.38
2	(50)	86	48	51	76	92	13	16	19.22
$2\frac{1}{2}$	(65)	92	60	—	92	—	16	—	28.89
3	(80)	108	65	—	108	—	19	—	30.48
4	(100)	121	68	—	140	—	22	—	33.02



Square head | Hexagonal head | Round head

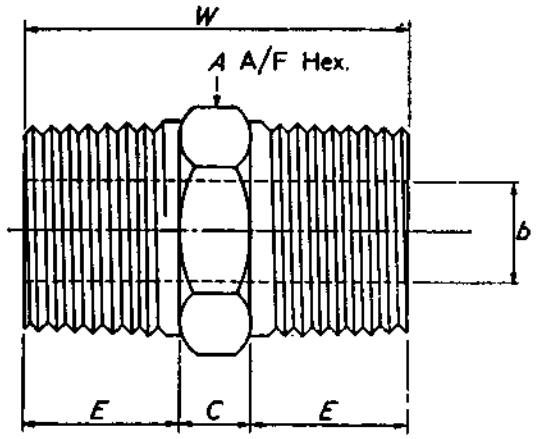
Screwed fittings. Minimum dimensions of pipe plugs

Nominal size		Square head			Hexagonal head			Round head	
		A	*B*	*C*	*D*	*E*	*F*	*J*	*K*
in	mm	mm	mm	mm	mm	mm	mm	mm	mm
⅛	(6)	10	6	7	11	10	6	35	10
¼	(8)	11	6	10	16	15	6	41	14
⅜	(10)	13	8	11	18	16	8	41	18
½	(15)	14	10	14	22	20	8	45	21
¾	(20)	16	11	16	27	21	10	45	27
1	(25)	19	13	21	35	25	10	51	33
1¼	(32)	21	14	24	45	26	14	51	43
1½	(40)	21	16	29	51	26	16	51	48
2	(50)	22	18	33	64	27	18	64	60
2½	(65)	27	19	38	76	41	19	70	73
3	(80)	29	21	43	89	42	21	70	90
4	(100)	32	32	64	118	45	32	76	114

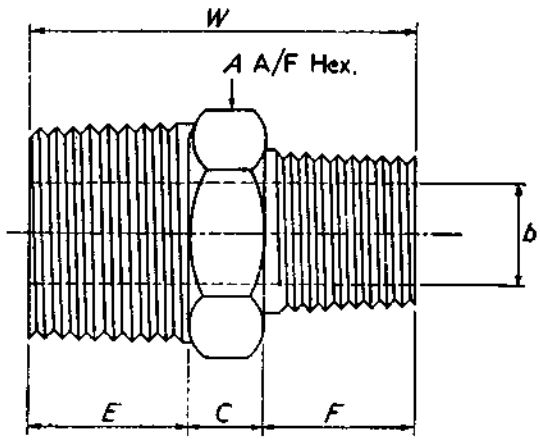


Screwed fittings. Minimum dimensions of bushings

Nominal size		*C*	*D*	*E*
in	mm	mm	mm	mm
$\frac{1}{4}$	(8)	3	16	15
$\frac{3}{8}$	(10)	4	18	16
$\frac{1}{2}$	(15)	5	22	20
$\frac{3}{4}$	(20)	6	27	21
1	(25)	6	35	25
$1\frac{1}{4}$	(32)	7	45	26
$1\frac{1}{2}$	(40)	8	51	26
2	(50)	9	64	27
$2\frac{1}{2}$	(65)	10	76	41
3	(80)	10	90	42
4	(100)	13	118	45



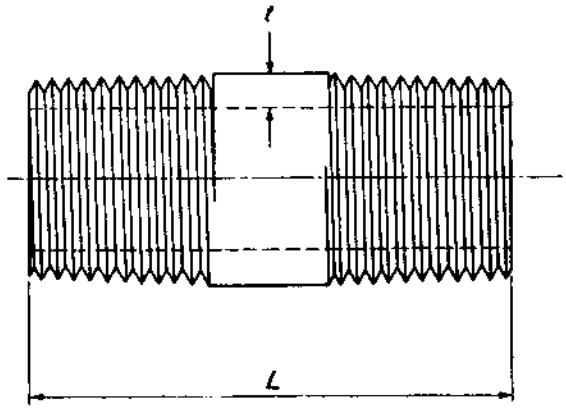
Equal



Reducing

Screwed fittings. Dimensions of hexagonal nipples

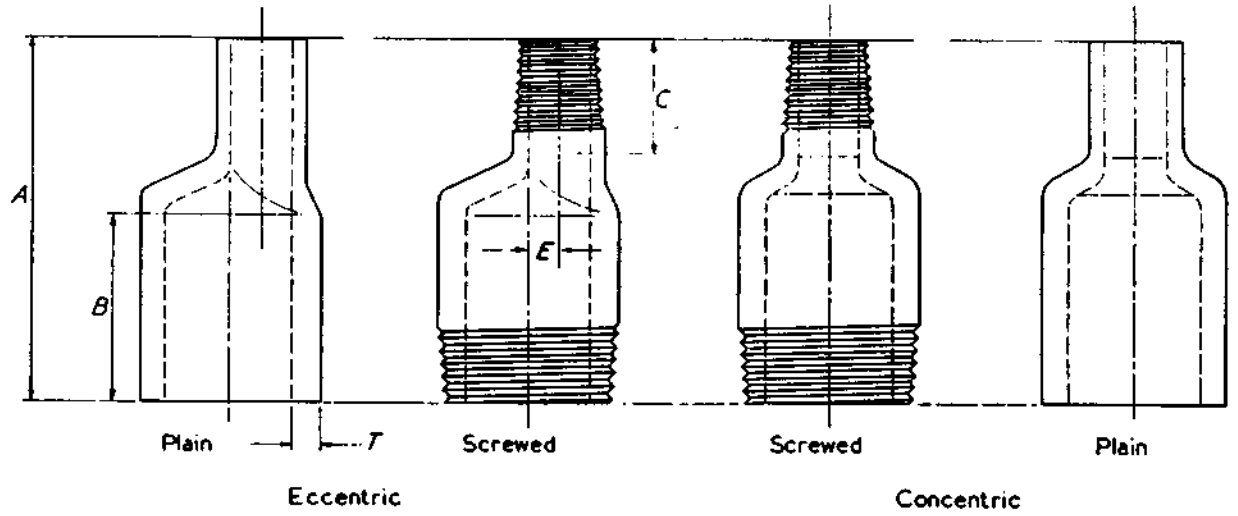
Nominal size				*A*	*W*	*E*	*b*		*C*	*F*
Equal		Reducing		(min.)	(min.)	(min.)	3000	6000	(min.)	(min.)
in	mm	in	mm	mm	mm	mm	mm	mm	mm	mm
$\frac{1}{8}$	(6)	—	—	11	26	10	5	2	6	—
$\frac{1}{4}$	(8)	—	—	15	36	15	8	6	6	—
—	—	$\frac{1}{4} \times \frac{1}{8}$	(8 × 6)	15	31	15	5	2	6	10
$\frac{3}{8}$	(10)	—	—	18	40	16	11	8	8	—
—	—	$\frac{3}{8} \times \frac{1}{4}$	(10 × 8)	18	39	16	8	6	8	15
$\frac{1}{2}$	(15)	—	—	22	48	20	14	11	8	—
—	—	$\frac{1}{2} \times \frac{3}{8}$	(15 × 10)	22	44	20	11	8	8	16
—	—	$\frac{1}{2} \times \frac{1}{4}$	(15 × 8)	22	43	20	8	6	8	15
$\frac{3}{4}$	(20)	—	—	27	52	21	19	13	10	—
—	—	$\frac{3}{4} \times \frac{1}{2}$	(20 × 15)	27	50	21	14	11	9	20
—	—	$\frac{3}{4} \times \frac{3}{8}$	(20 × 10)	27	46	21	11	8	9	16
1	(25)	—	—	35	60	25	24	17	10	—
—	—	$1 \times \frac{3}{4}$	(25 × 20)	35	56	25	19	13	10	21
—	—	$1 \times \frac{1}{2}$	(25 × 15)	35	55	25	14	11	10	20
$1\frac{1}{4}$	(40)	—	—	50	68	26	38	30	16	—
—	—	$1\frac{1}{4} \times 1$	(40 × 25)	50	67	26	24	17	16	25
—	—	$1\frac{1}{4} \times \frac{3}{4}$	(40 × 20)	50	63	26	19	13	16	21
—	—	$1\frac{1}{4} \times \frac{1}{2}$	(40 × 15)	50	62	26	14	11	16	20
2	(50)	—	—	62	71	27	49	39	17	—
—	—	$2 \times 1\frac{1}{4}$	(50 × 40)	62	70	27	38	30	17	26
—	—	2×1	(50 × 25)	62	70	27	24	17	18	25
—	—	$2 \times \frac{3}{4}$	(50 × 20)	62	65	27	19	13	17	21
—	—	$2 \times \frac{1}{2}$	(50 × 15)	62	65	27	14	11	18	20



Screwed fittings. Dimensions of round nipples

Nominal size		Std. lengths L^*				Wall thickness t	
						3000	6000
in	mm	mm					
$\frac{1}{8}$	(6)	50	75	100	150		—
$\frac{1}{4}$	(8)	50	75	100	150		—
$\frac{3}{8}$	(10)	50	75	100	150		—
$\frac{1}{2}$	(15)	—	75	100	150		
$\frac{3}{4}$	(20)	—	75	100	150		
1	(25)	—	75	100	150	Schedule 80	XXS
$1\frac{1}{4}$	(40)	—	75	100	150		
2	(50)	—	75	100	150		
$2\frac{1}{2}$	(65)	—	—	100	150		
3	(80)	—	—	100	150		
4	(100)	—	—	—	150		

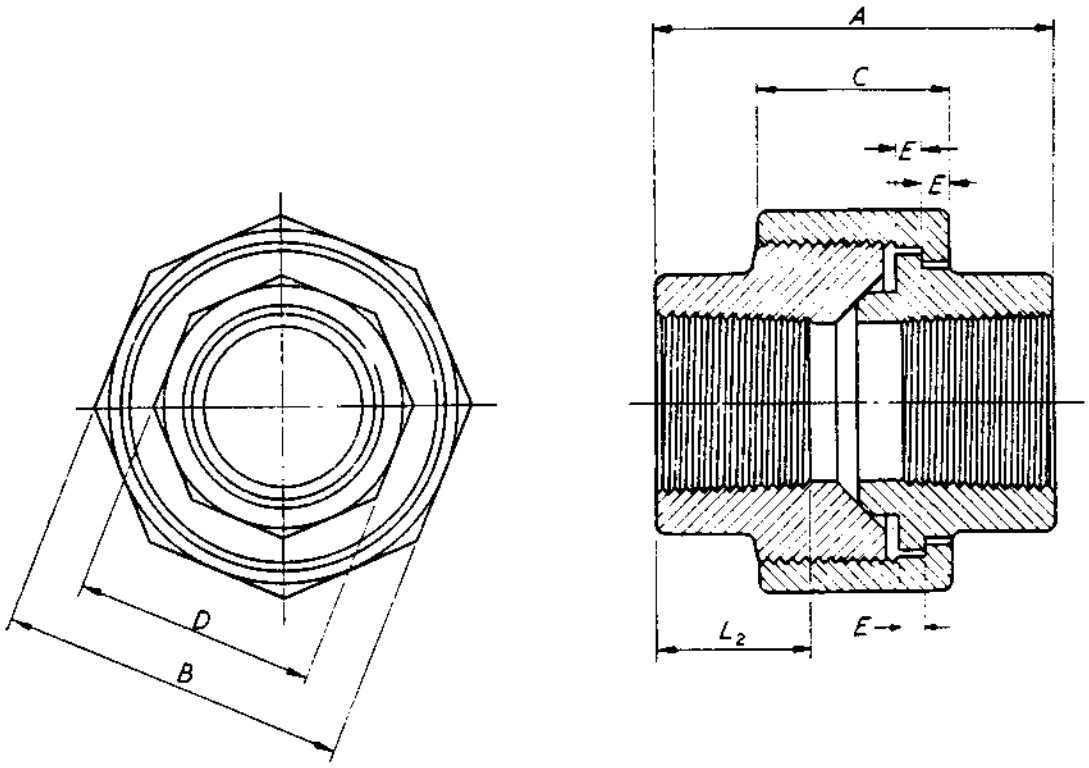
* Other lengths are available when specified.



Fittings. Dimensions of swage nipples

Nominal size		Parallel length			Eccentricity E		Thickness T and t*		
		(min.) A	(min.) B	(min.) C	3000	6000	Screwed/Plain 3000	Plain 6000	Screwed 6000
in	mm	mm	mm	mm	mm	mm			
⅜ × ¼	(10 × 8)	76	48	16	1.6	–			
½ × ⅜	(15 × 10)	89	56	19	1.6				
½ × ¼	(15 × 8)	89	56	19	3.2				
¾ × ½	(20 × 15)	95	57	22	2.4	2.4		Schedule 160	XXS
¾ × ⅜	(20 × 10)	95	57	22	4.0				
1 × ¾	(25 × 20)	102	64	22	2.8	2.0			
1 × ½	(25 × 15)	102	64	22	5.2	4.4			
1¼ × 1	(40 × 25)	114	70	25	6.7	6.4			
1¼ × ¾	(40 × 20)	114	70	25	9.5	8.3			
1¼ × ½	(40 × 15)	114	70	25	11.9	10.7			
2 × 1¼	(50 × 40)	165	108	29	5.6	5.2			
2 × 1	(50 × 25)	165	108	29	12.7	11.5			
2 × ¾	(50 × 20)	165	108	29	15.5	13.5	Schedule 80	Schedule 160	Double extra strong
2 × ½	(50 × 15)	165	108	29	17.5	15.9			
2½ × 2	(65 × 50)	178	114	32	4.8	3.2			
2½ × 1½	(65 × 40)	178	114	32	10.3	8.3			
3 × 2½	(80 × 65)	203	133	41	7.1	6.7			
3 × 2	(80 × 50)	203	133	41	11.9	9.9			
3 × 1½	(80 × 40)	203	133	41	17.5	15.5			
4 × 3	(100 × 80)	229	140	48	11.9	10.7			
4 × 2½	(100 × 65)	229	140	48	19.1	17.5			

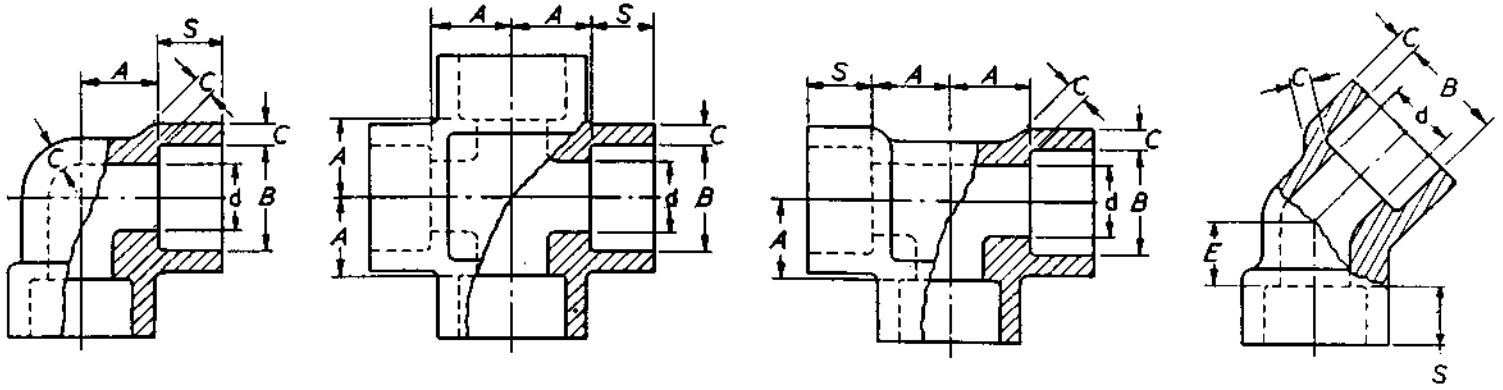
* Thickness and outside diameters of swage nipples shall correspond to those of the appropriate nominal pipe size.



Screwed fittings. Dimensions of unions

Nominal size		3000					
		End to end *A*	Width A/F union nut (min.) *B*	Height of union nut (min.) *C*	Width A/F of ends (min.) *D*	Thickness of shoulder (min.) *E*	Length of thread (min.) L_1
in	mm	mm	mm	mm	mm	mm	mm
$\frac{1}{8}$	(6)	40	32	16	17	3.2	6.70
$\frac{1}{4}$	(8)	43	32	18	19	3.2	10.21
$\frac{3}{8}$	(10)	48	36	19	22	3.2	10.36
$\frac{1}{2}$	(15)	51	43	21	30	4.0	13.56
$\frac{3}{4}$	(20)	57	50	24	36	4.8	13.86
1	(25)	64	60	25	41	4.8	17.34
$1\frac{1}{4}$	(32)	70	70	29	50	5.6	17.93
$1\frac{1}{2}$	(40)	79	78	30	60	5.6	18.38
2	(50)	89	95	37	70	6.4	19.22
$2\frac{1}{2}$	(65)	118	125	48	85	9.6	28.89
3	(80)	121	140	51	100	12.7	30.48

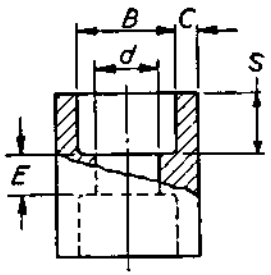
NOTE. Other external forms of nut and ends are permissible provided the minimum dimensions shown in this table are maintained.

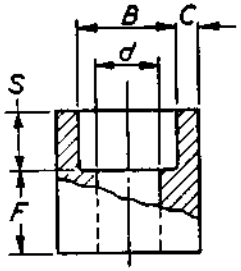


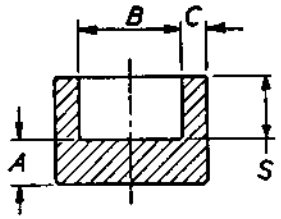
Socket-welding fittings. Dimensions of 90 ° elbows, crosses, tees and 45 ° elbows

Nominal size		Depth of socket (min.) *S*	Centre to bottom of socket *A*		Bore diameter of socket (min.) *B*	Socket wall thickness (min.) *C*		Bore diameter of fitting *d**		Centre to bottom of socket for 45 ° elbows *E*	
			3000	6000		3000	6000	3000	6000	3000	6000
in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
⅛	(6)	10	11	—	10.7	3.2	—	6.8	—	8	—
¼	(8)	10	11	—	14.1	3.3	—	9.2	—	8	—
⅜	(10)	10	14	—	17.6	3.5	—	12.5	—	8	—
½	(15)	10	16	19	21.8	4.1	5.2	15.5	11.8	11	13
¾	(20)	13	19	22	27.4	4.3	6.1	21.0	15.5	13	14
1	(25)	13	22	27	34.1	5.0	7.0	26.5	20.5	15	18
1¼	(32)	13	27	32	42.9	5.3	7.0	35.0	29.5	18	21
1½	(40)	13	32	38	49.0	5.6	7.8	40.5	34.0	21	26
2	(50)	16	38	41	61.0	6.1	9.5	52.0	43.0	26	29
2½	(65)	16	41	57	73.8	7.7	10.4	62.0	54.0	29	32
3	(80)	16	57	64	89.7	8.3	12.2	78.0	67.0	32	41

* Bore diameter *d* corresponds to schedule 40 and schedule 160 pipe respectively.



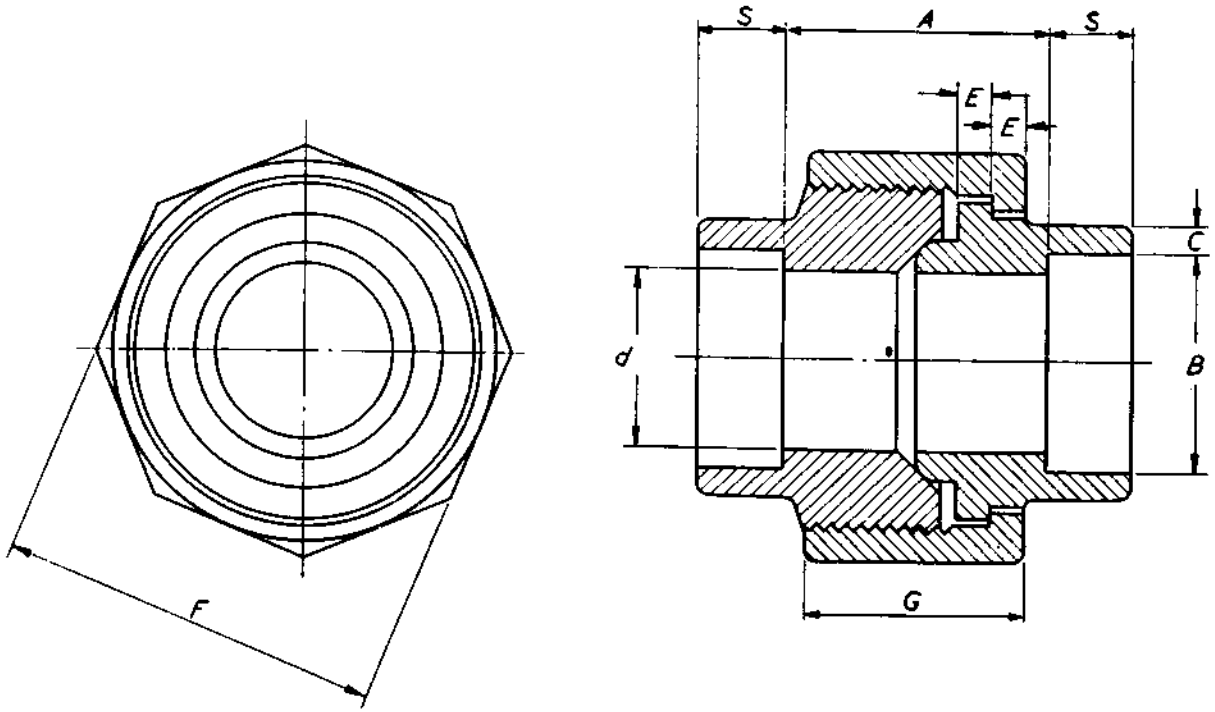




Socket-welding fittings. Dimensions of couplings, half-couplings and caps

Nominal size		Depth of socket (min.) *S*	Couplings distance between bottoms of sockets *E*	Half couplings distance between bottom of socket and opposite end *F*	Caps; wall thickness (min.) *A*		Bore diameter of socket (min.) *B*	Socket wall thickness (min.) *C*		Bore diameter of fitting *d**	
					3000	6000		3000	6000	3000	6000
in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
⅛	(6)	10	6	16	4	—	10.7	3.2	—	6.8	—
¼	(8)	10	6	16	7	—	14.1	3.3	—	9.2	—
⅜	(10)	10	6	17	7	—	17.6	3.5	—	12.5	—
½	(15)	10	10	22	8	11	21.8	4.1	5.2	15.5	11.8
¾	(20)	13	10	24	10	13	27.4	4.3	6.1	21.0	15.5
1	(25)	13	13	29	11	14	34.1	5.0	7.0	26.5	20.5
1¼	(32)	13	13	30	13	18	42.9	5.3	7.0	35.0	29.5
1½	(40)	13	13	32	14	19	49.0	5.6	7.8	40.5	34.0
2	(50)	16	19	41	18	24	61.0	6.1	9.5	52.0	43.0
2½	(65)	16	19	43	21	29	73.8	7.7	10.4	62.0	54.0
3	(80)	16	19	44	24	34	89.7	8.3	12.2	78.0	67.0

* Bore *d* corresponds to schedule 40 and schedule 160 pipe respectively.



Socket-welding fittings. Dimensions of unions

Nominal size		3000							
		Depth of socket (min.) *S*	Distance between bottoms of sockets (min.) *A*	Bore diameter of sockets (min.) *B*	Socket wall thickness (min.) *C*	Bore diameter of union *d**	Thickness of shoulder (min.) *E*	Width A/F of nut (min.) *F*	Height of nut (min.) *G*
in	mm	mm	mm	mm	mm	mm	mm	mm	mm
⅛	(6)	10	17	10.7	3.2	6.8	3.2	32	16
¼	(8)	10	17	14.1	3.3	9.2	3.2	32	18
⅜	(10)	10	17	17.6	3.5	12.5	3.2	36	19
½	(15)	10	18	21.8	4.1	15.5	4.0	41	21
¾	(20)	13	20	27.4	4.3	21.0	4.8	50	24
1	(25)	13	26	34.1	5.0	26.5	4.8	60	25
1¼	(32)	13	28	42.9	5.3	35.0	5.6	70	29
1½	(40)	13	30	49.0	5.6	40.5	5.6	78	30
2	(50)	16	36	61.0	6.1	52.0	6.4	95	37
2½	(65)	16	57	73.8	7.7	62.0	9.6	125	48
3	(80)	16	70	89.7	8.3	78.0	12.7	140	51

* Bore diameter *d* corresponds to schedule 40 pipe.

Tolerances for socket-welding fittings

Dimension	Nominal size in	Tolerance mm
Centre to bottom of socket elbows, crosses and tees Bottom of socket to opposite end in half-couplings and welding bosses	$\frac{1}{8}$ and $\frac{1}{4}$ $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 $2\frac{1}{2}$ and 3	± 0.8 ± 1.5 ± 2.0 ± 2.5
Bottom to bottom of sockets in couplings	$\frac{1}{8}$ and $\frac{1}{4}$ $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 $2\frac{1}{2}$ and 3	± 1.5 ± 3.0 ± 4.0 ± 5.0
Bore diameter of sockets	2 and smaller $2\frac{1}{2}$ and 3	$+0.3$ -0.0 $+0.4$ -0.0
Bore diameter of fittings	2 and smaller $2\frac{1}{2}$ and 3	± 0.4 ± 0.8
Concentricity of bore	all sizes	± 0.8
Alignment of axes	all sizes	1 in 200

Approx. weight of fittings in kgs.

3000 LBS FILETTATI - THREADED	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Gomiti a 90° - 90° Elbows	0.09	0.14	0.27	0.40	0.63	1.10	1.22	2.35	3.30	5.50	9.00	17.50
Gomiti a 45° - 45° Elbows	0.11	0.14	0.25	0.32	0.51	0.85	1.00	1.85	3.00	4.90	5.30	12.40
Tee - Equal Tees	0.20	0.19	0.39	0.52	0.83	1.38	1.66	3.12	4.00	5.90	11.50	19.50
Croci - Crosses	0.22	0.25	0.44	0.62	0.96	1.52	1.90	3.50	4.90	7.50	13.00	22.50
Manicotti - Full Couplings	0.03	0.05	0.06	0.14	0.20	0.40	0.70	1.00	1.90	2.95	4.20	8.10
Mezzi M. - Half Couplings	0.02	0.03	0.05	0.07	0.10	0.20	0.32	0.50	0.95	1.50	2.10	4.10
Tappi F. - Caps	0.03	0.05	0.06	0.12	0.19	0.35	0.56	0.75	1.45	2.30	3.20	6.40
Bocchettoni - Unions	—	0.13	0.20	0.40	0.50	1.00	1.45	1.60	2.50	—	—	—
Nippli esag. - Hex. Nipples	0.025	0.030	0.055	0.085	0.115	0.170	0.285	0.340	0.545	1.115	1.710	5.00
Tappi T.E. - Hex. H. Plugs	0.02	0.03	0.05	0.08	0.15	0.25	0.50	0.65	1.10	1.80	2.90	6.60
Rid. M/F - Hex. Bushings	—	0.02	0.02	0.04	0.06	0.14	0.32	0.38	0.60	1.00	1.60	3.50
90° Outlet	0.05	0.05	0.09	0.11	0.16	0.28	0.41	0.45	0.79	1.36	1.97	3.22
45° Outlet for long. radius	—	0.23	0.23	0.29	0.34	0.52	0.86	1.20	2.38	—	—	—
45° Outlet for lateral	—	0.23	0.23	0.29	0.34	0.52	0.86	1.20	2.38	—	—	—

3000 LBS TASCA - SOCKET WELDING	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Gomiti a 90° - 90° Elbows	0.08	0.09	0.13	0.25	0.32	0.52	0.86	1.12	1.80	2.60	4.80	15.00
Gomiti a 45° - 45° Elbows	0.07	0.08	0.13	0.18	0.30	0.45	0.75	0.90	1.30	2.20	3.70	12.00
Tee - Equal Tees	0.10	0.11	0.16	0.34	0.41	0.65	0.95	1.33	2.20	3.20	5.50	18.00
Croci - Crosses	0.18	0.20	0.25	0.35	0.48	0.80	1.25	1.80	2.70	4.50	7.20	19.50
Manicotti - Full Couplings	0.05	0.05	0.10	0.14	0.20	0.30	0.45	0.60	0.95	1.55	2.10	4.00
Mezzi M. - Half Couplings	0.05	0.06	0.11	0.15	0.21	0.35	0.50	0.65	1.10	1.80	2.50	4.90
Tappi femmina - Caps	0.03	0.06	0.07	0.14	0.16	0.30	0.45	0.55	1.00	1.50	2.65	4.50
Bocchettoni - Unions	—	0.20	0.35	0.40	0.45	1.00	1.30	1.70	3.00	4.57	6.50	12.80
90° Outlet	0.05	0.05	0.09	0.14	0.15	0.27	0.39	0.47	0.73	1.25	1.72	3.29
45° Outlet for long. radius	—	0.23	0.23	0.29	0.34	0.52	0.86	1.20	2.38	—	—	—
45° Outlet for lateral	—	0.23	0.23	0.29	0.34	0.52	0.86	1.20	2.38	—	—	—
90° Outlet Butt Welding	0.05	0.05	0.07	0.09	0.14	0.21	0.41	0.50	0.79	1.2	1.9	2.9

3000 LBS	1/4 x 1/8	1/2 x 1/8 1/2 x 1/4	3/4 x 1/4 3/4 x 1/2	1 x 1/4 1 x 1/2 1 x 3/4	1 1/2 x 1/2 1 1/2 x 3/4 1 1/2 x 1	2 x 3/4 2 x 1 2 x 1 1/2
MANICOTTI RIDOTTI REDUCING COUPLINGS FILETTATI / THREADED	0.05	0.14	0.20	0.40	1.00	1.90
NIPPLI A BOTTIGLIA SWEDGE NIPPLES SCH. 80	—	0.08	0.14	0.14 0.24	0.53	1.00
MANICOTTI RIDOTTI REDUCING COUPLINGS TASCA / SOCKET WELDING	0.05	0.14	0.20	0.30	0.60	0.95

NIPPLI DA TUBO SEAMLESS PIPE NIPPLES SCH. 80 - L. 100 mm	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	0.08	0.11	0.16	0.22	0.32	0.45	0.54	0.75

BRANCH OUTLETS

Product Information

Materials Table

Consolidation of Run Sizes

Dimensions and Weights

Burst Test Data

Quality System Certificate

DERIVAZIONI CON RINFORZO INTEGRALE

INTEGRALLY REINFORCED BRANCH CONNECTIONS

VIAR

NORME COSTRUTTIVE

Le derivazioni VIAR vengono calcolate seguendo scrupolosamente le Norme che ne regolano la costruzione. Generalmente vengono seguite le A.N.S.I. B 31.1 (3, 4, 8) ma possono esser seguite altre Norme, a richiesta del Cliente.
Il dimensionamento, in generale, è anch'esso in accordo con le normative A.N.S.I. ed in particolare con le B 36.10 e B 36.19 per le dimensioni dei tubi; le B 16.25 per gli smussi per saldatura. Vengono seguite le B 16.11 per l'esecuzione delle tasche da saldare e le B 1.20.1 per le filettature. Anche in questi casi, sono possibili esecuzioni secondo Norme diverse (DIN, AFNOR, ecc.) se richieste dal Cliente.
In base ai vari Codici a cui la fornitura è riferita, potranno esser forniti calcoli e disegni, a richiesta, entro 15 giorni dal ricevimento ordini. Lo stesso per quanto riguarda i certificati dei materiali, che seguono, in linea di massima, le ASTM.

DESIGN CODES

VIAR branch connections are designed fully in accordance with related Codes. Usually, ANSI B. 31 (3, 4, 8) are followed but on Customer's request, other Codes/Standards can be observed. Dimensions and finish are also meeting ANSI Std. B 36.10 and 19, for pipes, and B 16.25 for butt-welds. Socket dimensions and threads are in accordance with ANSI B 16.11 and B 1.20.1 respectively. Dimensions per DIN, AFNOR, etc. can be followed on special request.
For each Std./Code, verifications data and drawings can be available within 15 days from order reception as well as material certificates, generally to ASTM specs., provided a proper request is made, preferably on the enquiry stage.

GAMMA DI PRODUZIONE

PRODUCTION RANGE

VIAR WELD

... con estremità di uscita a saldare di testa. Generalmente secondo ANSI B 16.25, possono esser fornite con esecuzioni diverse.

... with butt-welding outlet end. Generally in accordance with ANSI B 16.25, other Std./Specs. can be followed.

VIAR SOCK

... con estremità di uscita a tasca da saldare. Generalmente secondo ANSI B 16.11, possono esser fornite con esecuzioni diverse.

... with socket weld outlet end. Generally in accordance with ANSI B 16.11, other Std./Codes can be followed.

VIAR THRED

... con estremità di uscita filettata secondo ANSI B 1.20.1. Anche questo tipo di filettatura, a richiesta, può esser eseguito in conformità a norme diverse.

... with threaded outlet end. Generally in accordance with ANSI B 1.20.1, on request, other theading Specs. can be followed.

VIAR LAT

... È una derivazione da saldare a 45° su collettore diritto. Può esser fornita con estremità di uscita a saldare di testa, a tasca o filettata, secondo le Norme e le varianti dei particolari sopra descritti.

It is a branch to be welded on run/header at an angle of 45°. Available with outlet end B.W., socket or threaded in accordance with Std./Codes above mentioned.

VIAR EL

... È una derivazione che va montata su curve a 90°, con il suo asse in corrispondenza dell'asse di uscita della curva. Generalmente è predisposta per il montaggio su curve a largo raggio. Anche questo tipo prevede l'esecuzione dell'estremità di uscita B.W., a tasca o filettata.

It is a branch to be welded on a 90° Elbow (long radius). Available with outlet end B.W., socket or threaded as described for VIAR-LAT.

VIAR NIP

... È in pratica un VIAR-WELD con una estensione integrale. Questa esecuzione, oltre che comportare il risparmio di un nipplo e di una saldatura, conferisce al pezzo una resistenza alle sollecitazioni meccaniche, specie se cicliche, di gran lunga superiore all'esecuzione tradizionale.

It is practically a VIAR-WELD, carrying an extension on outlet side. This extension is integral and allows to save a pipe nipple and a weld. The fitting shape gives to branch connection the possibility to withstand higher mechanical stresses, especially when cyclic, than a traditional branch connection.

INFORMAZIONI TECNICHE

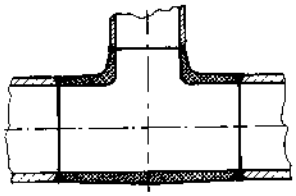
Le derivazioni con rinforzo integrale VIAR vengono usate in tutti quei casi in cui è necessario compensare la resistenza del tubo (o serbatoio) che è stata ridotta per effetto del foro praticato sullo stesso al fine di ottenere la derivazione.
Diversi sono i sistemi adottati a tale scopo e qui sotto in parte illustrati. C'è il pezzo a "T" (1) che risulta la soluzione migliore, in assoluto, ma non è sempre di facile reperibilità e comunque di costo elevatissimo. C'è il tradizionale rinforzo a mezzo piatto sagomato (2) e l'uso della sella (3).
Questi due sistemi risultano più economici del pezzo a "T" ma non presentano i vantaggi che possono riscontrarsi in un VIAR-WELD (4).

TECHNICAL INFORMATIONS

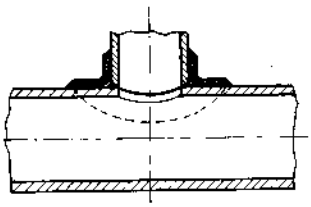
VIAR integrally reinforced branch connections are to be used where it is necessary to provide for a strength compensation, due to a hole made on pipe or header to obtain a branch. Many systems can be used to compensate the above mentioned strength reduction and shown here below. Fig. 1 represents a "T" fitting. This solution is absolutely the best, but its availability (sizes, thickness, material, etc.) is not so easy and its cost is quite high. Fig. 2 shows the traditional "pad" reinforcement, while Fig. 3 represents a "Saddle". These last two fittings result more economical than "T" but they dont show the technical advantages of a VIAR-WELD (Fig. 4).

COMPARAZIONE E VANTAGGI

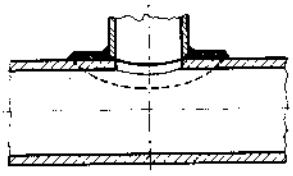
COMPARISON AND ADVANTAGES



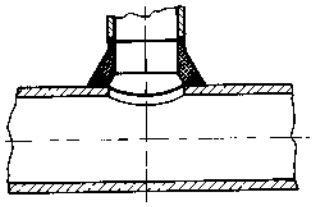
1) "T" a saldare
Welding tee



2) Piatto di rinforzo
Reinforcing pad



3) Sella di rinforzo
Welding saddle

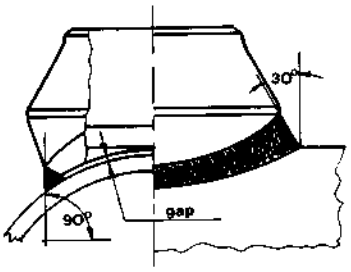


4) Raccordo con rinforzo integrale
Integrally reinforced branch

Con l'uso dei VIAR-WELD:
- Si possono ottenere risparmi economici che arrivano all'85 ÷ 90% nei confronti del pezzo a "T", specie nel caso di grosse riduzioni.
- Si garantiscono le reintegrazioni dei rinforzi richiesti, al 100%.
- La transizione graduale degli spessori tra collettore e derivazione crea una buona distribuzione delle sollecitazioni e ciò garantisce una resistenza a fatica illimitata.
- facile da installare, garantisce un flusso di fluido pieno e regolare.

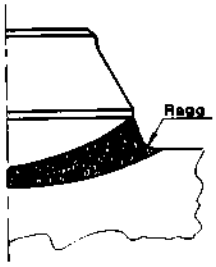
Using a VIAR-WELD you can obtain:
- *A reduction in cost installation up to 85 ÷ 90% if compared to a traditional "T", especially when high sizes reduction is involved.*
- *An 100% of area replacement as required by related Codes.*
- *A good stress distribution due to the gradual thickness transition from header to branch. This also improvesthe joint fatigue strength*
- *An easy installation and a good flow factor.*

SUGGERIMENTI PER L'INSTALLAZIONE



1) È opportuno provvedere al taglio del collettore dopo aver presentato sul posto il raccordo ed eseguita la tracciatura, seguendo il contorno interno.
2) Puntare il pezzo nei due lati trasversali e longitudinali ed eseguire i controlli dimensionali.
3) Provvedere alla saldatura con la prima passata di penetrazione. Proseguire quindi la saldatura normale, concentrando le passate nella zona longitudinale, che richiede maggior quantità di saldatura. Distribuire il numero delle passate al fine di poter eseguire le passate finali circonferenzialmente. L'ammontare della saldatura è determinato dagli smussi, ben marcati sul pezzo e dalle indicazioni delle figure qui a lato. Mantenendo una inclinazione della saldatura di circa 30° si garantisce il rimpiazzo dell'area di rinforzo, di cui la saldatura ne fa parte. Si può comunque tenere un angolo leggermente inferiore, purchè si provveda ad eseguire una discreta raggiatura verso il collettore.

INSTALLATION SUGGESTIONS



1) *Put the fitting on header, in the exact location and provide for marking the inside contour. Cut by torch and round off the hole inside edges.*
2) *Tack weld the fitting in longitudinal and tranverse sides and check all dimensions.*
3) *Provide for the first penetration weld. Afterwards, normal welding can be done, taking into account the crotch section. This area requires more weld amount, so that welding passes will be distributed accordingly in order to perform the final cover pass, all around the fitting. The weld amount is positively designated by the welding bevels on fitting and as indicated in figures on side. Reinforcement area, for which the weld is part, is guaranteed by keeping the weld, at the crotch section, approximately at 30°. Lower angles can be maintained, provided a good weld radius is made.*

DISTANZA DI PENETRAZIONE

Si avrà la vertenza, al momento della puntatura, di tenere il raccordo staccato dal collettore, di quel tanto necessario per poter effettuare la piena penetrazione.
La tabella qui sotto da i valori suggeriti per tale distanza.

ROOT "GAP"

When the fitting is tack welded a certain distance from the header must be respected, to allow the first penetration weld. The chart below gives the suggested values.

Derivaz. / *Outlet size*	**1/8 - 2**	**2 1/2 - 3 1/2**	**4 - 6**	**8 - 16**	**18 - 24**
Root gap	1.6 - 1/16"	2.38 - 3/32"	3.17 - 1/8"	3.99 - 5/32"	4.76 - 3/16"

COME ORDINARE UNA DERIVAZIONE VIAR

Al fine di ottenere il prodotto più valido ed evitare nello stesso tempo inutili aggravi economici, si consiglia:

a) Precisare il tipo (VIAR-WELD, VIAR-SOCK, ecc.)
b) Precisare i diametri della derivazione e del collettore.
c) Qualora la derivazione entra nella gamma di quelle descritte nelle tabelle di pag. 6 a 12, è sufficiente indicare come descritto nella corrispondente tabella.
d) Se gli spessori sia della derivazione che del collettore sono diversi (es. sched. 40, 80, 120 ecc.), vanno fatte le precisazioni in tal senso o vanno indicati i valori degli spessori.
e) Il materiale va indicato, possibilmente secondo specifica ASTM.
f) Se richiesto il calcolo di verifica, precisare il Codice da seguire e indicare, oltre che la pressione e la temperatura, anche le tolleranze di lavorazione ed il sovrametallo di corrosione ed eventuale fattori di progetto o simili, previsti dal Codice in questione.

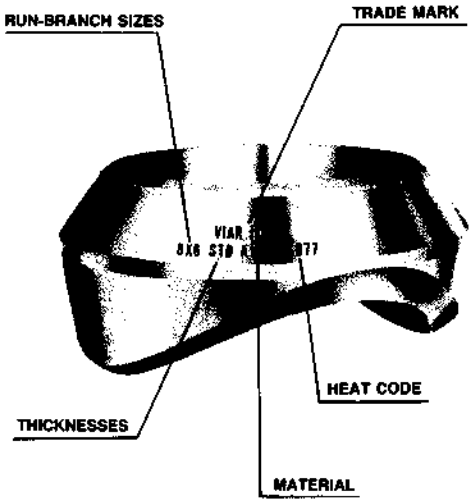
HOW TO ORDER A VIAR BRANCH CONNECTION

To obtain a proper fitting and to avoid undue economical charges, VIAR suggests:

a) Specify VIAR type (VIAR-WELD, VIAR-SOCK, etc.).
b) Specify both run and outlet sizes.
c) If the fitting is included in the range listed it is sufficient to specify thickness class
d) If thicknesses are different (i.e. sched. 40, 80, etc.) both for run or branch, these must be clearly indicated.
e) Specify the material (preferably to ASTM Specs).
f) If calculation is required, specify the design Code and other data usefull for verification as: pressure, temperature, mill tolerance, corrosion allowance and design limitation factors, if any.

MARCATURA E IDENTIFICAZIONE

Ogni pezzo VIAR è contraddistinto dalla relativa marcatura, in accordo con le MSS-SP 25. A queste marcature possono venir aggiunte quelle indicate dal Cliente.
Le marcature sono eseguite in zona distante dalle saldature, cosicchè l'identificazione del pezzo è possibile anche dopo che lo stesso è saldato in linea.
Generalmente eseguite con punzoni normali, vengono usati punzoni arrotondati nei materiali in cui l'incisione del punzone potrebbe creare inizio di rottura.
Altri sistemi di marcatura possono venir adottati in casi particolari, su specifica richiesta.



MARKING AND IDENTIFICATION

Each VIAR fitting is marked according to MSS. SP 25 Std. Further marking can be added upon Customer request.
Marking are located far from welding areas, so that fitting data are still identifiable once the same is welded on line.
Marking is usually obtained by normal punches. Low stress/dotted line punches are used on materials susceptible to cracks due to sharp edges of normal punches.
Other marking criteria can be performed upon Customer request.

CONTROLLO QUALITÀ

I prodotti VIAR sono garantiti sotto tutti gli aspetti.
Esiste un sistematico controllo delle materie prime, acquistate sempre presso Fornitori qualificati, controllo che comprova le caratteristiche fisico-chimiche del materiale.
In seguito all'accettazione, viene stabilito il codice di colata che sarà impresso indelebilmente sul pezzo e servirà alla sua rintracciabilità.
I controlli in processo e finale, garantiscono il rispetto delle dimensioni e comprendono i controlli inerenti al trattamento termico, alle durezze, ai controlli visivi ed NDE, quando richiesti.
Quando richiesto, il pezzo viene verificato secondo i Codici citati ed il suo dimensionamento garantito per le particolari condizioni di esercizio previste.
Quanto sopra, nel rispetto del Manuale di C.Q. e delle relative procedure.

QUALITY CONTROL

VIAR products are guaranteed under all respect.
A systematic check of raw material, coming only from qualified Suppliers, assures the physical and mechanical characteristics in conformance with the related specifications.
When the material is accepted, an Heat Code is assigned (or the Heat N° itself) and this will follow the piece, permanently.
In process and final inspections are not limited to visual and dimensional checks, but include all other checks, specifically requested as: heat treatment, hardness, NDE, etc.
When requested, the fitting construction is verified in accordance with specified Codes and resulting dimensions makes the joint positively suitable for the foreseen service conditions.
The above listed meets VIAR Q.C. Manual and Procedures requirements.

MATERIALI

La tabella qui sotto riporta un elenco di materiali che risultano di impiego più o meno corrente. Sono tutti riferiti alle specifiche ASTM, anche se, a richiesta, possono venir usati materiali riferiti a specifiche diverse.

MATERIALS

Chart below shows the types of material commonly used. Reference is made to ASTM Specifications but, on request, materials referred to different specifications can be used.

MATERIALE *MATERIAL*	ASTM Grado/Marca	COMPOSIZIONE CHIMICA *CHEM. COMPOSITION*									CARATT. MECCANICHE *MECH. PROPERTIES*				
		C max	Mn max	P max	S max	Si max	Ni	Cr	Mo	Altri	ROTT. *TENSILE* K.s.i. MPa min	SNERV. *YELD* K.s.i. MPa min	ALLUNG. *ELONG.* 2" % min	STRIZ. *RED OF AREA* % min	DUREZZA *HARDNESS* HB
Acc. al Carb. Carbon Stl.	A105	.35	.60/1.05	.040	.050	.35	.040[1]	.30[1]	.12[1]	(1)	70 485	36 250	22	30	137/187
Acc. Legati *Alloy steels*	A182-F1	.28	.60/90	.045	.045	.15/.35	—	—	.44/.65	—	70 485	40 275	25	35	143/192
	A182-F5a	.25	.60	.040	.030	.50	.50	4.0/6.0	.44/.65	—	90 620	65 450	22	50	143/217
	A182-F9	.15	.30/.60	.030	.030	.50/1.0	—	8.0/10.0	.90/1.10	—	85 590	55 380	20	40	179/217
	A182-F11	.10/.20	.30/.80	.040	.040	.50/1.0	—	1.0/1.5	.44/.65	—	70 485	40 275	20	30	143/207
	A182-F22	.15	.30/.60	.040	.040	.50	—	2.0/2.5	.87/1.13	—	75 515	45 310	20	30	156/207
Acc. inox *Austenitic S.S.*	A182-F304	.08	2.00	.040	.030	1.00	8.0/11.0	18.0/20.0	—	—	75 520	30 205	30	50	—
	A182-F304L	.035	2.00	.040	.030	1.00	8.0/11.0	18.0/20.0	—	—	70 485	25 175	30	50	—
	A182-F316	.08	2.00	.040	.030	1.00	10.0/14.0	16.0/18.0	2.0/3.0	—	75 515	30 205	30	50	—
	A182-F316L	.035	2.00	.040	.030	1.00	10.0/15.0	16.0/18.0	2.0/3.0	—	70 485	25 175	30	50	—
	A182-F321	.08	2.00	.040	.030	1.00	9.0/12.0	17.0 min	—	(2)	75 515	30 205	30	50	—
Acc. per bassa temp. *Low temp. c.s.*	A350-LF2	.30	1.35	.035	.04	.15/.30	—	—	—	—	70 485	36 250	22	30	(3)
	A350-LF3	.20	.90	.035	.04	.20/.35	3.25/3.75	—	—	—	70 485	37.5 260	22	35	(4)
Acc. per serv. alte press. *H. pressures c.s.*	A694-F52	.26	1.40	.04	.05	.15/.35	—	—	—	—	66 455	52 360	20	—	—
	A694-F56	.26	1.40	.04	.05	.15/.35	—	—	—	—	68 470	56 385	20	—	—
	A694-F60	.26	1.40	.04	.05	.15/.35	—	—	—	—	75 515	60 415	20	—	—
	A694-F65	.26	1.40	.04	.05	.15/.35	—	—	—	—	77 530	65 450	20	—	—
Monel 400	B164 UNS-NO4400	.3	2.0	.024	.024	.50	63.0	—	—	(5)	70 480	25 170	35	—	110/149 (a)
Monel K500	SAE-AMS 4676	.25	1.5	—	.01	1.0	63.0	—	—	(6)	90 620	40 275	25	—	140/185 (a)
Inconel 600	B166 UNS-NO6600	.15	1.0	—	.015	.50	72.0	14.0/17.0	—	(7)	80 550	35 240	30	—	115/175 (a)
Incoloy 800	B408 UNS-NO8800	.1	1.5	—	.015	1.0	30.0/35.0	19.0/23.0	—	(8)	75 515	30 205	30	—	117/188 (a)
Incoloy 825	B425 UNS-NO8825	.05	1.0	—	.03	.5	38.0/46.0	19.5/23.5	2.5/3.5	(9)	100 690	47 324	45	—	(a)
Hastelloy C 276	B574 UNS-N10276	0.1	1.0	.04	.03	.08	resto	14.5/16.5	15.0/17.0	(10)	100 690	41 283	40	—	(a)
Cu-Ni 90-10	(B-402)	.05	1.0	.02	.02	—	9.0/11.0	—	—	(11)	40 275	15 105	30	—	—

1) Elementi ammessi nella percentuale indicata assieme a: Cu ≤ 0.40, Va ≤ 0.03, Nb ≥ 0.02
Allowed elements as maximum value together with Cu ≤ 0.40, Va ≤ 0.03, Ng ≤ 0.02

2) Contenuto di Titanio ≥ 5 volte il C. ma non superiore a 0.70%
Titanium content ≥ 5 times the C. but not more than 0.70%

3) Resilienza a —50 °F (—45.6 °C) su provetta a "V", media di 3 provette 20 J (min 1 prov. 16 J)
Impact value at minus 50 °F on 10x10, "V" notch specimen, average 20 J (min 1 spec. 16 J)

4) Resilienza a —150 °F (—101.1 °C) su provetta a "V", media di 3 provette 20 J (min 1 prov. 16 J)
Impact value at minus 150 °F on 10x10, "V" notch specimen, average 20 J (min 1 spec. 16 J)

5) In più (*moreover*) Fe ≤ 2.5% - Cu = 28.0 ÷ 34.0%

6) In più (*moreover*) Fe ≤ 2.0% - Cu = 28.0 ÷ 34.0% - AL = 2.0 ÷ 4.0% - Ti = 0.25 ÷ 1.0%

7) In più (*moreover*) Cu ≤ 0.5% - Fe = 6.0 ÷ 10.0% - Nella percentuale di Ni è incluso il Co (Ni includes Co)

8) In più (*moreover*) Cu ≤ 0.75% - AL = 0.15 ÷ 0.60% - Ti = 0.15 ÷ 0.60 - Fe ≥ 39.5

9) In più (*moreover*) Fe min = 22.0% - Cu = 1,5 ÷ 3.0% - Ti = 0.6 ÷ 1.2% - AL ≤ 0.2

10) In più (*moreover*) Co ≤ 2.5% - W = 3.0 ÷ 4.5 - Fe = 4.0 ÷ 7.0 - V ≤ 0.35

11) In più (*moreover*)Cu = resto - Fe = 1.0 ÷ 1.8 - Zn ≤ 0.50 - Pb ≤ 0.02

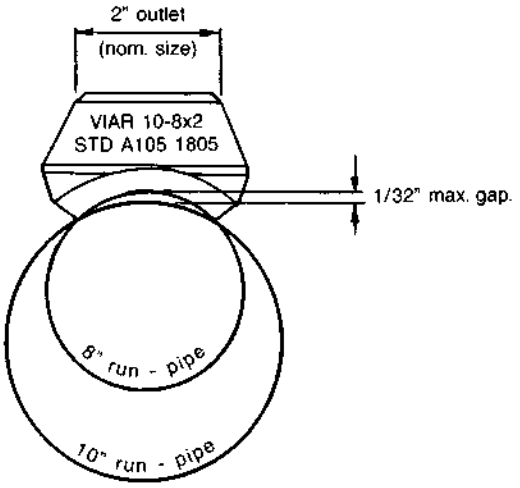
(a) Caratteristiche meccaniche corrispondenti al materiale ricotto
Mechanical properties referred to material in annealed conditions.

UNIFICAZIONE DIAMETRI COLLETTORI

RUN SIZES CONSOLIDATION

La VIAR ha unificato le raggiature delle sue derivazioni per poterle usare su diversi diametri di collettore, pur garantendo un gioco massimo di 0,8 mm. sull'uniformità della distanza di penetrazione. Ciò al fine di non rendere necessarie modifiche alle normali procedure di saldatura. Detta unificazione contribuisce in modo positivo alla riduzione dello stock di magazzino.
Ogni derivazione porta la marcatura, oltre che del suo diametro, anche quella dei collettori, come da tabella.

— Per collettori superiori ai 36" va usato il tipo piano.
— Per diametri nominali superiori ai 4" va eseguita, in linea di massima, una raggiatura per ogni diametro di collettore.



VIAR provided to unify outlets radius in order to allow the use of same fitting on different run pipe sizes.
The above, keeping into account a max. gap of 0.8 mm, with respect to the uniformity of normal root gap, to avoid undue changes of welding procedures. Besides this, a positive warehouse stock reduction is obtained.
Each fitting is marked with its nominal size and the range of run sizes on which it can be welded.

— *For run sizes over 36", the flat type is used.*
— *For outlet sizes over 4", usually a specific radius is required for each run size.*

STANDARD WEIGHT & EXTRA STRONG VIAR WELD - 3000 lbs - VIAR-THRED e SOCK

	Outlet size												
	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Run sizes	3/8	3/8	1/2	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
	1/2	1/2	1-3/4	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5
	1-3/4	1-3/4	2 1/2-1 1/4	1	1 1/2-1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6
	2 1/2-1 1/4	2 1/2-1 1/4	36-3	1 1/2-1 1/4	2 1/2-2	2	2 1/2	3	4	4	5	6	8
	36-3	36-3	—	2 1/2-2	5-3	2 1/2	3 1/2-3	4-3 1/2	5	5	6	8	10
	—	—	—	8-3	12-6	3 1/2-3	5-4	6-5	6	6	8	10	14-12
	—	—	—	36-10	36-14	5-4	8-6	12-8	10-8	8	10	14-12	20-16
	—	—	—	—	—	10-6	18-10	24-14	18-12	12-10	14-12	20-16	36-24
	—	—	—	—	—	36-12	36-20	36-26	36-20	18-14	20-16	36-24	—
	—	—	—	—	—	—	—	—	—	36-20	36-24	—	—

SCH. 160 & DOUBLE EXTRA STRONG - VIAR WELD

	Outlet size					
	1/2	3/4	1	1 1/4	1 1/2	2
Run sizes	1/2	1-3/4	1	1 1/2-1 1/4	1 1/2	2
	1 1/4-3/4	2-1 1/4	2-1 1/4	2 1/2-2	2 1/2-2	2 1/2
	36-1 1/2	6-2 1/2	10-3	10-3	3 1/2-3	3 1/2-3
	—	36-8	36-12	36-12	8-4	5-4
	—	—	—	—	20-10	8-6
	—	—	—	—	36-24	18-10
	—	—	—	—	—	36-20
	—	—	—	—	—	—

6000 lbs VIAR THRED & SOCK

Outlet size					
1/2	3/4	1	1 1/4	1 1/2	2
1-3/4	1	1 1/2-1 1/4	1 1/2	2	2 1/2
2-1 1/4	2 1/2-1 1/4	2 1/2-2	2 1/2-2	2 1/2	3
6-2 1/2	10-3	10-3	3 1/2-3	3 1/2-3	4
36-8	36-12	36-12	8-4	5-4	5
—	—	—	20-10	8-6	6
—	—	—	36-24	18-10	10-8
—	—	—	—	36-20	20-12
—	—	—	—	—	36-24

STANDARD - EXTRA STRONG - 3000 lbs - VIAR NIP

	Outlet size				
	1/2	3/4	1	1 1/2	2
Run sizes	6-1 1/2	3-1 1/2	1 1/2	2	3
	36-8	36-4	2 1/2-2	3 1/2-3	4-3 1/2
	—	—	5-3	5-4	6-5
	—	—	36-6	12-6	12-8
	—	—	—	36-14	36-14

SCH 160 - DOUBLE EXTRA STRONG - 6000 lbs - VIAR NIP

Outlet size				
1/2	3/4	1	1 1/2	2
36-1 1/2	36-1 1/2	4-1 1/2	4-2	4-3
—	—	36-6	36-6	8-5
—	—	—	—	36-10
—	—	—	—	—
—	—	—	—	—

STD. WT - X.STRONG - 3000 lbs - VIAR EL

	Outlet size		
	1/4 ÷ 3/4	1 ÷ 1 1/2	2
Run sizes	36 ÷ 1 1/4	36-2	36-3

SCH 160 - XX.STRONG - 6000 lbs - VIAR EL

Outlet size		
1/4 ÷ 1/2	3/4 ÷ 1 1/4	1 1/2
36-1 1/4	36-2	36-3

STD. WT - X.STRONG - 3000 lbs - VIAR LAT

	Outlet size			
	1/4 ÷ 1/2	3/4	1 ÷ 1 1/2	2
Run sizes	2 1/2-1 1/4	1 1/2-1 1/4	2 1/2-2	5-4
	12-3	5-2	5-3	8-6
	—	12-6	12-6	12-10

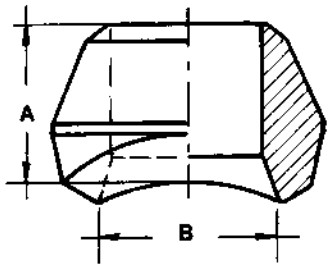
SCH 160 - XXS - 6000 lbs - VIAR LAT

Outlet size			
1/4 ÷ 3/8	1/2	3/4 ÷ 1 1/4	1 1/2
2 1/2-1 1/4	1 1/2-1 1/4	2 1/2-2	5-4
12-3	5-2	5-3	8-6
—	12-6	12-6	12-10

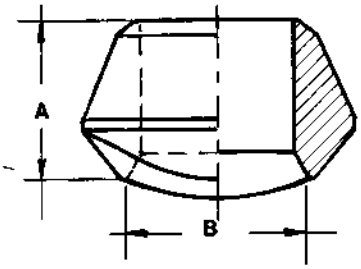
VIAR-WELD

STANDARD WEIGHT

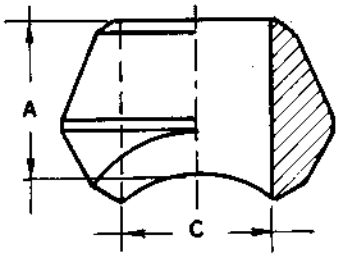
DERIVAZIONE RIDOTTA



REDUCING SIZE



DERIVAZIONE UGUALE



FULL SIZE

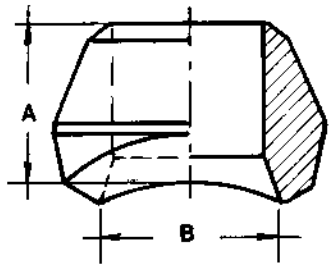
DIM. NOM. *NOM. SIZE*	REDUCING SIZE					FULL SIZE		
	A		B[1]		PESO *WEIGHT*	C		PESO *WEIGHT*
	mm	inch	mm	inch	Kg	mm	inch	Kg
1/8	16	5/8	16	5/8	0.04	—	—	—
1/4	16	5/8	16	5/8	0.04	—	—	—
3/8	19	3/4	19	3/4	0.07	—	—	—
1/2	19	3/4	24	15/16	0.08	16	5/8	0.07
3/4	22	7/8	30	1 3/16	0.12	20.5	13/16	0.12
1	27	1 1/16	36.5	1 7/16	0.22	26	1 1/32	0.18
1 1/4	32	1 1/4	44.5	1 3/4	0.36	35	1 3/8	0.32
1 1/2	33.5	15/16	51	2	0.45	41	1 5/8	0.36
2	38	1 1/2	65	2 9/16	0.80	52.5	2 1/16	0.70
2 1/2	41.5	1 5/8	76	3	1.15	62	2 7/16	1.10
3	44.5	1 3/4	93.5	3 11/16	1.80	78	3 1/16	1.70
3 1/2	47.5	1 7/8	101.5	4	2.50	90.5	3 9/16	2.25
4	51	2	120.5	4 3/4	2.90	101.5	4	3.05
5	57	2 1/4	141	5 9/16	4.60	128.5	5 1/16	4.85
6	60.5	2 3/8	170	6 11/16	7.0	154	6 1/16	7.50
8	70	2 3/4	220.5	8 11/16	12.0	201.5	7 15/16	12.7
10	78	3 1/16	274.5	10 13/16	19.5	254	10	20.0
12	85.5	3 3/8	325.5	12 13/16	26.7	304.5	12	29.4
14	89	3 1/2	357	14 1/16	29.9	336.5	13 1/4	31.8
16	93.5	3 11/16	408	16 1/16	34.0	387.5	15 1/4	41.7
18	101.5	4	459	18 1/16	44.0	438	17 1/4	56.7
20	114.5	4 1/2	510	20 1/16	53.5	489	19 1/4	79.3
24	124	4 7/8	611	24 1/16	99.7	590.5	23 1/4	127

1) Stessa dimensione per derivazioni ridotte e uguali.
— Fino a 10", incluso, i pezzi sono uguali per Std. WT e Sch. 40 - Per 12" e oltre lo sch. 40 prevede spessori superiori. - Pezzi disponibili a richiesta.

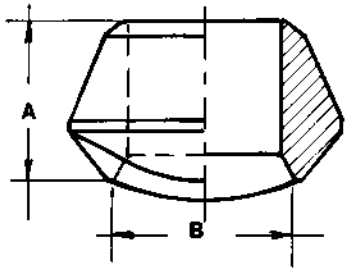
1) Same dimension for reducing and full size.
— Up to and including 10" - dimensions are the same for St. WT and Sch 40 out-lets. For 12" and over, sch. 40 requires thicker walls. Fitting available, on request.

VIAR-WELD
EXTRA STRONG

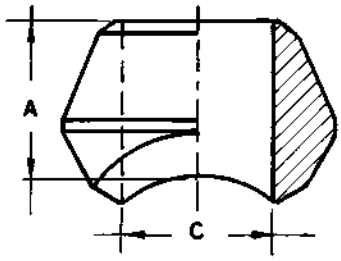
DERIVAZIONE RIDOTTA



REDUCING SIZE



DERIVAZIONE UGUALE



FULL SIZE

DIM. NOM. *NOM. SIZE*	REDUCING SIZE					FULL SIZE		
	A		B(1)		PESO *WEIGHT*	C		PESO *WEIGHT*
	mm	inch	mm	inch	Kg	mm	inch	Kg
1/8	16	5/8	16	5/8	0.04	—	—	—
1/4	16	5/8	16	5/8	0.04	—	—	—
3/8	19	3/4	19	3/4	0.07	—	—	—
1/2	19	3/4	24	15/16	0.09	14	9/16	0.07
3/4	22	7/8	30	1.3/16	0.14	19	3/4	0.12
1	27	1 1/16	36.5	1.7/16	0.21	24	15/16	0.18
1 1/4	32	1 1/4	44.5	1.3/4	0.40	32	1 1/4	0.32
1 1/2	33.5	1 5/16	51	2	0.50	38	1 1/2	0.40
2	38	1 1/2	65	2 9/16	0.79	49	1 15/16	0.72
2 1/2	41.5	1 5/8	76	3	1.18	59	2 5/16	1.13
3	44.5	1 3/4	93.5	3 11/16	1.85	73.5	2 7/8	1.85
3 1/2	47.5	1 7/8	101.5	4	2.54	85	3 5/16	2.30
4	51	2	120.5	4 3/4	2.90	97	3 13/16	3.40
5	57	2 1/4	141	5 9/16	4.70	122	4 13/16	5.00
6	78	3 1/16	170	6 11/16	10.4	146	5 3/4	10.4
8	87.5	3 7/16	220.5	8 11/16	20.4	193.5	7 5/8	21.0
10	93.5	3 11/16	265	10 7/16	24.8	247.5	9 3/4	25.4
12	100	3 15/16	316	12 7/16	35.0	298.5	11 3/4	35.0
14	105	4 1/8	351	13 13/16	37.7	330	13	39.0
16	113	4 7/16	402	15 13/16	46.2	381	15	52.0
18	119	4 11/16	452	17 13/16	58.9	432	17	59.0
20	127	5	503	19 13/16	71.5	482.5	19	84.7
24	140	5 1/2	605	23 13/16	141	584	23	146

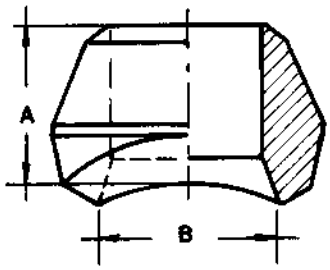
1) Stessa dimensione per derivazioni ridotte e uguali.
— Fino a 8", incluso, i pezzi sono uguali per XS e Sch. 80 - Per 10" e oltre, lo sch. 80 prevede spessori superiori - Pezzi disponibili a richiesta.

1) Same dimension for reducing and full size.
— Up to and including 8" - dimensions are the same for XS and Sch 80 out-lets. For 10" and over, sch. 80 requires thicker walls. Fitting available, on request.

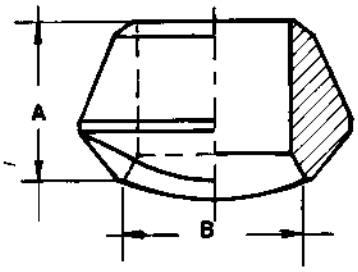
VIAR-WELD

SCHED. 160 & DOUBLE EXTRA STRONG

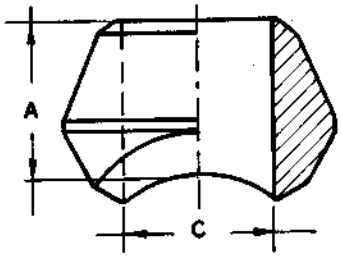
DERIVAZIONE RIDOTTA



REDUCING SIZE



DERIVAZIONE UGUALE



FULL SIZE

DIM. NOM. *NOM. SIZE*	REDUCING SIZE					FULL SIZE		
	A		B		PESO *WEIGHT*	C*		PESO *WEIGHT*
	mm	inch	mm	inch	Kg	mm	inch	Kg
1/2	28.5	1 1/8	14	9/16	0.15	11.5	7/16	0.15
3/4	31.5	1 1/4	19	3/4	0.32	15.5	5/8	0.32
1	38	1 1/2	25.5	1	0.38	21	13/16	0.38
1 1/4	44.5	1 3/4	33.5	1 5/16	0.55	29.5	1 3/16	0.60
1 1/2	51	2	38	1 1/2	0.80	34	1 5/16	0.85
2	55.5	2 3/16	43	1 11/16	0.97	43	1 11/16	1.00
2 1/2	62	2 7/16	54	2 1/8	1.55	54	2 1/8	1.70
3	73	2 7/8	73	2 7/8	2.85	66.5	2 5/8	2.95
4	84	3 5/16	98.5	3 7/8	4.75	87	3 7/16	4.95
5	93.5	3 11/16	122	4 13/16	6.50	109.5	4 5/16	6.80
6	105	4 1/8	146	5 3/4	12.7	132	5 3/16	13.7
8								
10								
12								
14								
16								

Dimensioni fornibili a richiesta

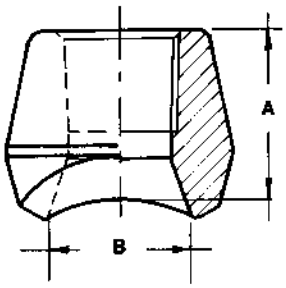
Dimensions available on request

*) Applicabile a derivazioni e collettori Sch. 160. Per spessori XXS, la dimensione "C" varia in conformità ai valori relativi.
— I diametri di derivazione segnati in tabella sono validi per collettori sch. 160 e XXS. Per diametri 8" e oltre precisare sempre lo spessore del collettore.

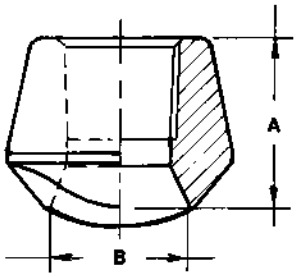
*) *Suitable for sch. 160 run pipe. For XXS pipes, dimension "C" varies to meet in valve of values.*
— *Out-let sizes listed in the chart are suitable for sch. 160 and XXS run pipes. For 8" out-let and over, always specify run pipe thickness.*

VIAR-THRED

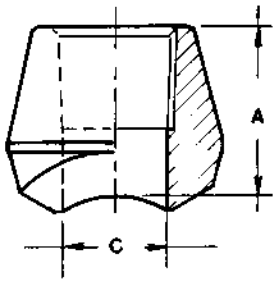
DERIVAZIONE RIDOTTA



REDUCING SIZE



DERIVAZIONE UGUALE



FULL SIZE

3000 lbs

DIM. NOM. *NOM. SIZE*	REDUCING SIZE					FULL SIZE		
	A		B		PESO *WEIGHT*	C*		PESO *WEIGHT*
	mm	inch	mm	inch	Kg	mm	inch	Kg
1/8	19	3/4	16	5/8	0.06	—	—	—
1/4	19	3/4	16	5/8	0.06	—	—	—
3/8	20.5	13/16	19	3/4	0.09	—	—	—
1/2	25.5	1	24	15/16	0.11	14	9/16	0.12
3/4	27	1 1/16	30	1 3/16	0.17	19	3/4	0.19
1	33.5	1 5/16	36.5	1 7/16	0.29	24	15/16	0.31
1 1/4	33.5	1 5/16	44.5	1 3/4	0.41	32	1 1/4	0.45
1 1/2	35	1 3/8	51	2	0.46	38	1 1/2	0.50
2	38	1 1/2	65	2 9/16	0.80	49	1 15/16	0.87
2 1/2	46	1 13/16	76	3	1.40	59	2 5/16	1.50
3	51	2	93.5	3 11/16	2.00	73.5	2 7/8	2.15
3 1/2	54	2 1/8	101.5	4	2.60	85	3 5/16	2.85
4	57	2 1/4	120.5	4 3/4	3.35	97	3 13/16	3.60

*) Applicabili a collettori Std. weight & Extra Strong.
*) *Suitable for Std. Wt & XS pun pipes.*

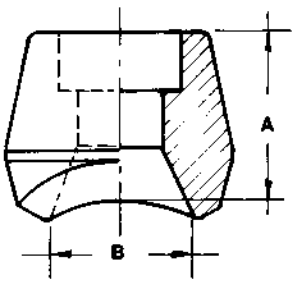
6000 lbs

DIM. NOM. *NOM. SIZE*	REDUCING SIZE				
	A		B		PESO *WEIGHT*
	mm	inch	mm	inch	Kg
1/4	28.5	1 1/8	14	9/16	0.20
3/8	28.5	1 1/8	14	9/16	0.20
1/2	31.5	1 1/4	19	3/4	0.30
3/4	36.5	1 7/16	25.5	1	0.50
1	39.5	1 9/16	33.5	1 5/16	0.90
1 1/4	39.5	1 9/16	38	1 1/2	0.85
1 1/2	43	1 11/16	49	1 15/16	1.45
2	52.5	2 1/16	59	2 5/16	2.75

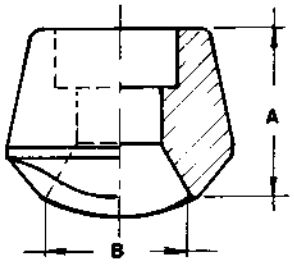
Disponibili solo per derivazioni ridotte
Available only for reducing size outlet.

VIAR-SOCK

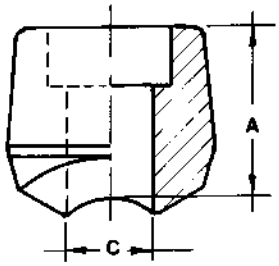
DERIVAZIONE RIDOTTA



REDUCING SIZE



DERIVAZIONE UGUALE



FULL SIZE

3000 lbs

DIM. NOM. *NOM. SIZE*	REDUCING SIZE					FULL SIZE		
	A		B		PESO *WEIGHT*	C*		PESO *WEIGHT*
	mm	inch	mm	inch	Kg	mm	inch	Kg
1/8	19	3/4	16	5/8	0.06	—	—	—
1/4	19	3/4	16	5/8	0.06	—	—	—
3/8	20.5	13/16	19	3/4	0.09	—	—	—
1/2	25.5	1	24	15/16	0.11	14	9/16	0.12
3/4	27	1 1/16	30	1 3/16	0.17	19	3/4	0.19
1	33.5	1 5/16	36.5	1 7/16	0.29	24	15/16	0.31
1 1/4	33.5	1 5/16	44.5	1 3/4	0.41	32	1 1/4	0.45
1 1/2	35	1 3/8	51	2	0.46	38	1 1/2	0.50
2	38	1 1/2	65	2 9/16	0.80	49	1 15/16	0.87
2 1/2	46	1 13/16	76	3	1.40	59	2 5/16	1.50
3	51	2	93.5	3 11/16	2.00	73.5	2 7/8	2.15
3 1/2	54	2 1/8	101.5	4	2.60	85	3 5/16	2.80
4	57	2 1/4	120.5	4 3/4	3.30	97	3 13/16	3.50

*) Applicabili a collettori Std. weight & Extra Strong.
*) *Suitable for Std. Wt & XS pun pipes.*

6000 lbs(1)

DIM. NOM. *NOM. SIZE*	REDUCING SIZE				
	A		B		PESO *WEIGHT*
	mm	inch	mm	inch	Kg
1/4	28.5	1 1/8	14	9/16	0.20
3/8	28.5	1 1/8	14	9/16	0.20
1/2	31.5	1 1/4	19	3/4	0.30
3/4	36.5	1 7/16	25.5	1	0.50
1	39.5	1 9/16	33.5	1 5/16	0.90
1 1/4	39.5	1 9/16	38	1 1/2	0.85
1 1/2	43	1 11/16	49	1 15/16	1.45
2	52.5	2 1/16	59	2 5/16	2.75

1) Foro raccordo secondo tubo sch. 160 - 2) Disponibili solo per derivazioni ridotte.
1) Fitting hole to suit sch. 160 pipe. - 2) Available only for reducing size out-let.

9000 lbs

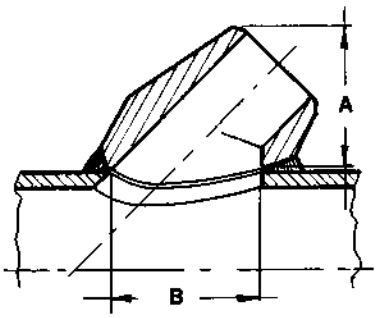
DIM. NOM. *NOM. SIZE*	REDUCING SIZE				
	A		B		PESO *WEIGHT*
	mm	inch	mm	inch	Kg
1/2	31.5	1 1/4	19	3/4	0.32
3/4	36.5	1 7/16	25.5	1	0.55
1	39.5	1 9/16	33.5	1 5/16	0.95
1 1/2	43	1 11/16	49	1 15/16	1.50
2	52.5	2 1/16	59	2 5/16	2.90

1) Foro raccordo secondo tubo XXS. - 2) Disponibili solo per derivazioni ridotte.
1) Fitting hole to suit XXS pipe. - 2) Available only for reducing size out-let.

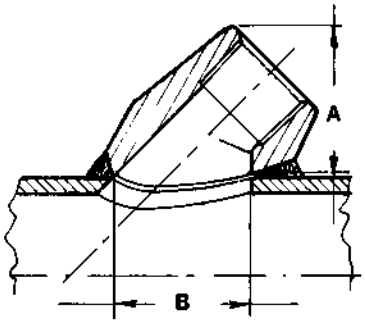
VIAR-LAT

DERIVAZIONI RIDOTTE / *REDUCING SIZES*

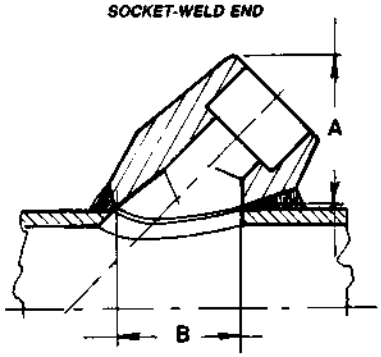
A SALDARE DI TESTA
B.W. END



FILETTATA
THREADED END



A TASCA
SOCKET-WELD END

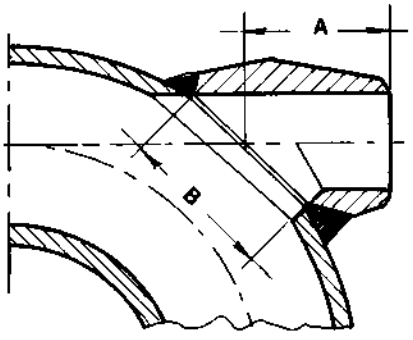


DIAM. NOM. *NOM. SIZE*	3000 lbs - STD-WT & EXTRA STRONG(1)					6000 lbs - SCH. 160 & DOUBLE EXTRA STRONG(1)				
	A		B		Peso *Weight* Kg	A		B		Peso *Weight* Kg
	mm	inch	mm	inch		mm	inch	mm	inch	
1/4	39.5	19/16	36.5	17/16	0.23	39.5	19/16	36.5	17/16	0.35
3/8	39.5	19/16	36.5	17/16	0.23	39.5	19/16	36.5	17/16	0.35
1/2	39.5	19/16	36.5	17/16	0.30	46	113/16	44.5	13/4	0.40
3/4	46	113/16	41	15/8	0.35	54	21/8	54	21/8	0.67
1	56	23/16	51	2	0.53	63.5	21/2	66.5	25/8	1.00
1 1/4	63.5	21/2	66.5	25/8	0.86	70	23/4	76	3	1.32
1 1/2	71	213/16	73	27/8	1.20	85.5	33/8	105	41/8	2.80
2	92	35/8	96	313/16	2.40	95	33/4	111	43/8	3.60
2 1/2 to 10	Fornibili, a richiesta, nella sola versione BW *Available, on request, as butt-welding end*					Fornibili, a richiesta, nella sola versione BW *Available, on request, as butt-welding end*				

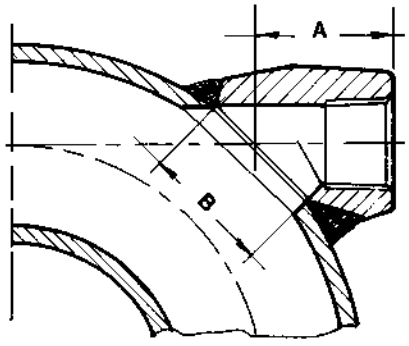
VIAR-EL

DERIVAZIONI RIDOTTE / *REDUCING SIZES*

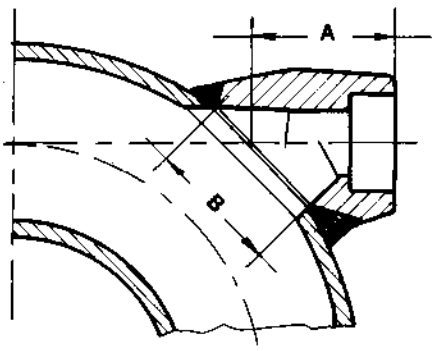
A SALDARE DI TESTA
B.W. END



FILETTATA
THREADED END



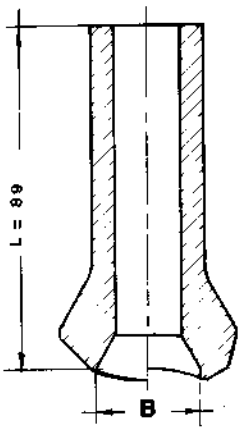
A TASCA
SOCKET-WELD END



DIAM. NOM. *NOM. SIZE*	3000 lbs - STD-WT & EXTRA STRONG(1)					6000 lbs - SCH. 160 & DOUBLE EXTRA STRONG(1)				
	A		B		Peso *Weight* Kg	A		B		Peso *Weight* Kg
	mm	inch	mm	inch		mm	inch	mm	inch	
1/4	41	15/8	38	11/2	0.23	41	15/8	38	11/2	0.35
3/8	41	15/8	38	11/2	0.23	41	15/8	38	11/2	0.35
1/2	41	15/8	38	11/2	0.30	47.5	17/8	43	111/16	0.40
3/4	47.5	17/8	43	111/16	0.35	57	21/4	57	21/4	0.67
1	57	21/4	57	21/4	0.53	63.5	21/2	73	27/8	1.00
1 1/4	63.5	21/2	73	27/8	0.86	68	211/16	79.5	31/8	1.32
1 1/2	70	23/4	79.5	31/8	1.20	82.5	31/4	106.5	43/16	2.80
2	82.5	31/4	106.5	43/16	2.40	101.5	4	114.5	41/2	3.60
2 1/2 to 10	Fornibili, a richiesta, nella sola versione BW *Available, on request, as butt-welding end*					Fornibili, a richiesta, nella sola versione BW *Available, on request, as butt-welding end*				

1) Disponibili solo per riduzioni da 2 ÷ 3 diametri in sù.
1) Available only for reduction rate of 2 ÷ 3 pipe size and over.

VIAR-NIP



È un raccordo particolarmente indicato per tutte quelle derivazioni che richiedono, immediatamente dopo l'uscita dal collettore, l'installazione di una valvola, uno strumento di misura, ecc.
L'impiego di detto raccordo risulta valido quando sono presenti forti vibrazioni, sollecitazioni cicliche, che possono provocare, nel tempo, rotture per fatica.
Risulta valido anche dal lato economico in quanto non richiede l'uso del nipplo e soprattutto evita l'esecuzione di una saldatura con relativi esami non distruttivi (NDE).

The use of this fitting is particularly indicated where a valve, gauge or similar, need to be installed in a branch connection, quite close to the header.

Fitting design suggests its use where line vibrations, cyclic stresses, etc., may result in fatigue fracture. It is also suggested from an economical point of view as, for the same application, a pipe nipple and a weld is avoided with consequent NDE inspection.

Estremità filettata, piana, B.W. - *Threaded, SW, BW end*

DIAM. NOM. *NOM SIZE*	3000 lbs			6000 lbs		
	B		Peso *Weight* Kg	B		Peso *Weight* Kg
	mm	inch		mm	inch	
1/4	16	5/8	0.20	—	—	—
3/8	19	3/4	0.23	—	—	—
1/2	24	15/16	0.25	14	9/16	0.25
3/4	30	1 3/16	0.40	19	3/4	0.50
1	36.5	1 7/16	0.65	25.5	1	0.70
1 1/4	44.5	1 3/4	0.75	33.5	1 5/16	0.88
1 1/2	50.8	2	0.95	38	1 1/2	1.15
2	65	2 9/16	1.45	43	1 11/16	1.50

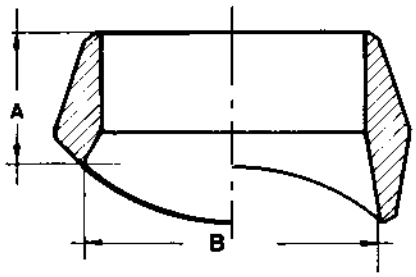
1) La dimensione "L", è uguale per tutti i diametri. Eseguibili, a richiesta, con lunghezze fino a 6 1/2" (165 mm).
— Lo spessore della porzione di nipplo per la Cl 3000 è pari allo Sch. 80: per la Cl 6000 è pari allo Sch. 160. Disponibili, a richiesta, anche con spessore XXS.

1) "L" dimension is the same for all sizes. Available, on request, with lengths up to 6 1/2" (165 mm).
— Nipple portion thickness for 3000 lb is related to Sch. 80 pipe: for 6000 lb, the reference is made to Sch. 160. Available, on request, with XXS thk.

VIAR-LW

Sono derivazioni aventi le stesse caratteristiche dei VIAR-WELD e sono impiegate su linee di leggero spessore. Da usarsi normalmente con tubi sch. 5 o 10 (5 S o 10 S nel caso degli inox), hanno le dimensioni A e B pressochè uguali ai corrispondenti raccordi Std. Wt., ma un diametro esterno più piccolo e di conseguenza gli smussi di saldatura. Ciò comporta una riduzione della quantità di saldatura che può variare dal 50 al 70%, riducendo, di conseguenza il loro costo di installazione.
Disponibili da 2" a 12", sono fattibili, a richiesta, nella gamma dei diametri inferiori e superiori.

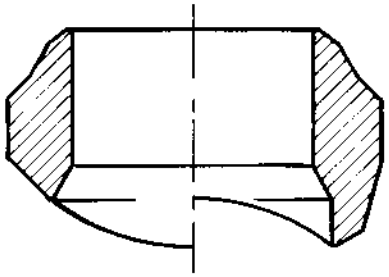
Same as VIAR-WELD, these fittings are used on light weight pipes, sched. 5 and 10 (5 S and 10 S for S.S. pipes). A and B dimensions correspond to Std. Wt. fittings but the outside diameter is smaller. Consequently, the weld bevels result smaller and a reduction of weld amount varying from 50 to 70%. Their installation cost is then proportionally contained.
Available from 2" to 12", on request, lower or higher outlet sizes can be manufactured.



VIAR HW

Sono derivazioni da usarsi prevalentemente nei casi in cui le condizioni di esercizio richiedono tubi di grosso spessore.
Il loro dimensionamento e la loro forma si scostano da quelle tradizionali dei VIAR-WELD e ciò per poter utilizzare al massimo le aree di rinforzo, in rapporto agli spessori del collettore. Il tutto, tenendo in considerazione l'ammontare delle saldature, che in questi casi sarebbe enorme. Costruiti normalmente per collettori aventi spessori da mm 22 (7/8") ed oltre, i diametri nominali iniziano da 3".

This type of fitting is to be used when service condition requires heavy wall pipes/headers.
The shape is slightly different than the traditional VIAR-WELD in order to utilize at best the available replacement area resulting from header thickness.
The above takes into consideration the weld amount that results fairly contained
Manufactured to match header thicknesses of 7/8" and over, outlet sizes starts from 3".



Certificate No. MIL930277

DET NORSKE VERITAS

I N S P E C T I O N   C E R T I F I C A T E

MANUFACTURER: VIAR S.R.L. VIA L.DA VINCI,9 - 21044 CAVARIA (VA)

SUBJECT : BURST TESTS OF No.4 VIAR - WELDS

SITE OF TEST: O.M.R. - BORGONOVO VT.(PC) ITALY.

Messers Viar was visited on the 31st May, 1993 for the purpose of witnessing burst tests of No. 4 Viar-Weld pieces as described on table 1.

The scope of the tests was to demonstrate that the design calculation adopted by "Viar" was in conformity with the applicable code and in accordance with "Viar" standard production.

The Viar-Weld joints are welded with the appropriate temporary tubes and cups and were submitted to hydrostatic test pressure since the relevant break.

All materials of components were ckecked by writter, and material certificates were reviewed at the begining of the construction, visual check of edge preparation prior to welding is carried out and relevant WPS documents are also examined.

The relevant calculation designed issued by Viar were in accordance with the following codes:
ANSI B.31.1, B.31.3, B.31.4 and B.31.8

The hydrostatic pressure tests were considered according to ANSI B.16.9.

The equipment used for hydrostatic pressure tests was "pump type SC-pump" suitable for a range of max. 1500kg/cmq.

DET NORSKE VERITAS

Certificate No MIL930277
Sheet 2 of 2

The result obtained are shown on table "1".
The pressure gauge used for checking the hydrostatic test pressure have been initially calibrated by means of a master gauge manufactured by Budenberg serial No 18374.
Calibrated date July, 1992 expiry date July, 1993.
The result obtained of burst tests and the type of breaks and their position of 4 components is shown on table 1 and also in Viar Hydro test certificates (attached).

TABLE 1 - VIAR-WELD JOINT LIST

SIZE OF JOINT	MINIMUM DESIGN VALUE (MPA)	PRESSURE BROKEN VALUE (MPA)	GAUGE VALUE IN KG/CMQ	BROKEN AREA	SKETCH POSITION
8"X4"SCH XS/XS	52,70	60,79	620	ON PIPE 8"UNDER"VIAR WELD"JOINT	SEE VIAR HYDRO TEST CERTIFIC ATE
8"X4"SCH 160/160	98,2	110,80	1130	ON PIPE 8"UNDER VIAR WELD JOINT	SEE VIAR HYDRO TEST CERTIFIC ATE
12"X6" SCH 80/XS	52,78	58,83	600	ON PIPE 12" UNDER VIAR WELD JOINT	SEE VIAR HYDRO TEST CERTIFIC ATE
16"X10" SCH STD/STD	22,30	24,31	248	ON PIPE 16"UNDER VIAR WELD JOINT	SEE VIAR HYDRO TEST CERTIFIC ATE

NOTE: Considering that the above burst tests were conducted in order to verify the Viar-Weld trend, after visual examination we checked that no fracture appeared on Viar-Weld components and on relevant welded area.

Agrate Brianza
4th June,1993

D.Ba[illegible]
Surveyor to [illegible] Italia S.r.l.

Form No.: 40.91e

Hydraulic & Offshore SUPPLIES

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