ITEMS

- Austenitic Stainless Steel & Carbon Steel Welded Pipe Nipples
- Austenitic Stainless Steel & Carbon Steel Welded Pipe caouplings
- Gas Metal Arc Welding Torch Consumables - MIG/MAG, TIG, PLASMA
- Metal precision CNC Machining

Hankook Nipple

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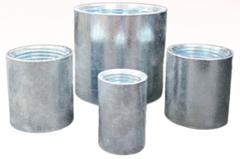
HANKOOKNIPPLE

STAINLESS STEEL • CARBON STEEL • COPPER PIPE FITTINGS

Certified Global Standard

Stainless Steel Coupling

Stainless Steel Nipples



Zinc-Coated Steel Coupling

White & Black Nipples

Copper Adapter

Stainless Fittings

Inspection & Certificate

| HANKOOK NIPPLE

Coating Thickness Monitor

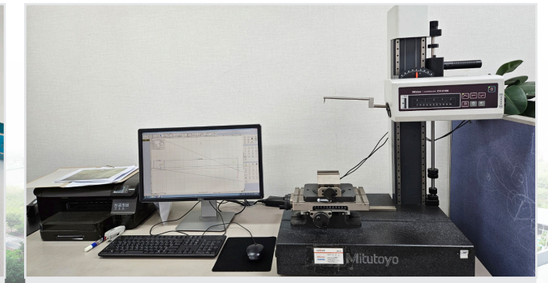
Plug Gauge

Ring Gauge

Salt Spray Test

Straightness

Thread Pitch Gauge



Surface Measuring

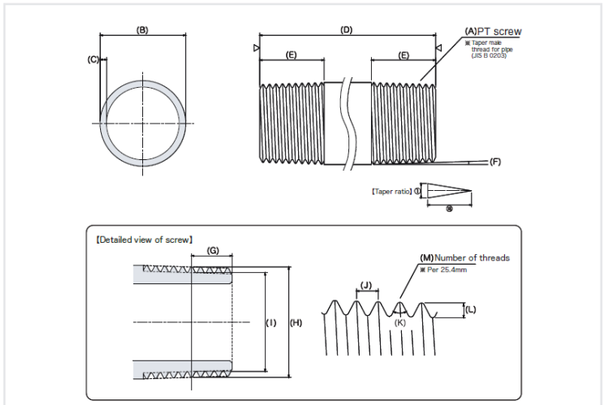
Carbon Steel Pipe Nipples

| Standard - KS B1533 / JIS B 2302

White

Black

Tube One-side Ends (TOE)



Length tolerances(D) below 50A are -0/ +2.0mm and above 65A are -0/+3.0mm

Dimension (Unit - mm) * D - Length Is based on Barrel Nipple *Thickness is based on Schedule 20.

A	Size	6A	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A
B	OD	10.5	13.8	17.3	21.7	27.2	34.0	42.7	48.6	60.5	76.3	89.1	114.3	139.8	165.2
C	Thichness	2.00	2.35	2.35	2.65	2.65	3.25	3.25	3.25	3.65	3.65	4.05	4.50	4.85	4.85
D	Length	24	26	28	34	38	42	50	50	58	70	78	90	103	103
E	Screw Length	11.5	12.5	13.5	16.5	18.5	20.5	24.5	24.5	28.5	34.5	38.5	44.5	50	50
F	Taper Angle	1.7899 °													
G	Effective Thread Size	3.97	6.01	6.35	8.16	9.53	10.39	12.7	12.7	15.88	17.46	20.64	25.4	28.58	28.58
H	Effective diameter	9.728	13.157	16.662	20.955	26.441	33.249	41.91	47.803	59.614	75.184	87.884	113.03	138.43	163.83
I	Effective valley diameter	8.566	11.445	14.950	18.631	24.117	30.291	38.952	44.845	56.650	72.226	84.926	110.072	135.472	160.872
J	Screw Pitch	0.9071	1.3368		1.8143		2.3091								
K	Thread Angle	55 °													
L	Thread Height	0.581	0.856		1.162		1.479								
M	Number of Threads	28	19		14		11								

- Material - KS D 3507 / JIS G 3452 -Schedule 20, KS D 3562 / JIS G3454 - Above Schedule 40
- Dimensions & Ends conforms to KS B 1533 / JIS B2302
- Threads conforms to KS B 0222 / JIS B 0203
- RoHS Compliant
- Certified Korean Standard by KSA

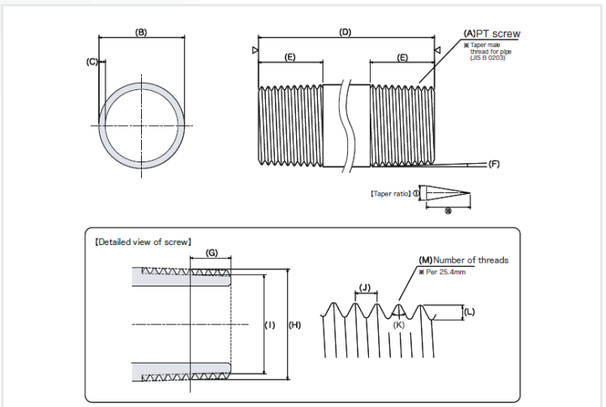
Stainless Steel Pipe Nipples

| Standard - KS B1533 / JIS B 2302

Long Nipple

Barrel Nipple

Tube One-side Ends (TOE)



Length tolerances(D) below 50A are -0/ +2.0mm and above65A are -0/+3.0mm

Dimension (Unit - mm) * D - Length Is based on Barrel Nipple *Thickness is based on Schedule 20.

A	Size	6A	8A	10A	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A
B	OD	10.5	13.8	17.3	21.7	27.2	34.0	42.7	48.6	60.5	76.3	89.1	114.3	139.8	165.2
C	Thichness	2.00	2.00	2.00	2.50	2.50	3.00	3.00	3.00	3.50	3.50	4.00	4.00	5.00	5.00
D	Length	24	26	28	34	38	42	50	50	58	70	78	90	103	103
E	Screw Length	11	12	13	16	18	20	24	24	28	33.5	37.5	43.5	50	50
F	Taper Angle	1.7899 °													
G	Effective Thread Size	3.97	6.01	6.35	8.16	9.53	10.39	12.7	12.7	15.88	17.46	20.64	25.4	28.58	28.58
H	Effective diameter	9.728	13.157	16.662	20.955	26.441	33.249	41.91	47.803	59.614	75.184	87.884	113.03	138.43	163.83
I	Effective valley diameter	8.566	11.445	14.950	18.631	24.117	30.291	38.952	44.845	56.650	72.226	84.926	110.072	135.472	160.872
J	Screw Pitch	0.9071	1.3368		1.8143		2.3091								
K	Thread Angle	55 °													
L	Thread Height	0.581	0.856		1.162		1.479								
M	Number of Threads	28	19		14		11								

- Material - KS D 3576 / JIS G 3459 Stainless Steel 304 / 316L - Schedule 20 ~ 80
- Dimensions & Ends conforms to KS B 1533 / JIS B2302
- Threads conforms to KS B 0222 / JIS B 0203
- RoHS Compliant
- Certified Korean Standard by KSA / KC by KIWATEC

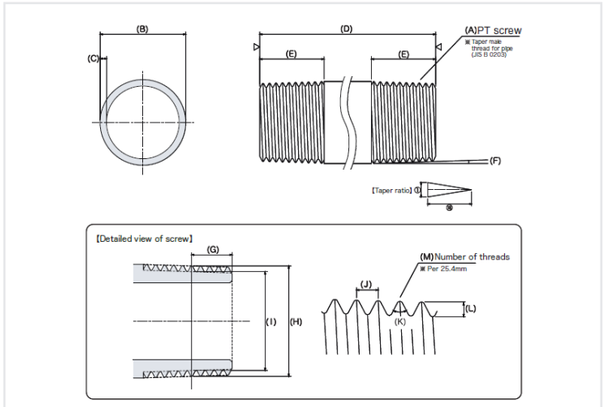
Long Nipples

| Standard - KS B1533 / JIS B 2302

Carbon Steel - White

Carbon Steel - Black

Austenitic Stainless Steel



Length tolerances(D) below 50A are -0/ +2.0mm and above65A are -0/+3.0mm

Dimension (Unit - mm) *Thickness is based on Schedule 20.

Size		Barrel Nipple Length	Long Nipple Length									Threads Length	OD	WT
A	Inch		50	65	75	100	125	150	200	250	300		(B)	(C)
6	1/8	24	0	0	2.50	0	0	0	0	0	0	11.0	10.50	JIS G3459 or JIS 3452
8	1/4	26	0	0	0	0	0	0	0	0	0	12.0	13.80	
10	3/8	28	0	0	0	0	0	0	0	0	0	13.0	17.30	
15	1/2	34	0	0	0	0	0	0	0	0	0	16.0	21.70	
20	3/4	38	0	0	0	0	0	0	0	0	0	18.0	27.20	
25	1	42	0	0	0	0	0	0	0	0	0	20.0	34.00	
32	1-1/4	50			0	0	0	0	0	0	0	24.0	42.70	
40	1-1/2	50			0	0	0	0	0	0	0	24.0	48.60	
50	2	58			0	0	0	0	0	0	0	28.0	60.50	
65	2-1/2	70				0	0	0	0	0	0	33.5	76.30	
80	3	78				0	0	0	0	0	0	37.5	88.90	
100	4	90				0	0	0	0	0	0	43.5	114.30	
125	5	103											139.70	
150	6	103											165.40	

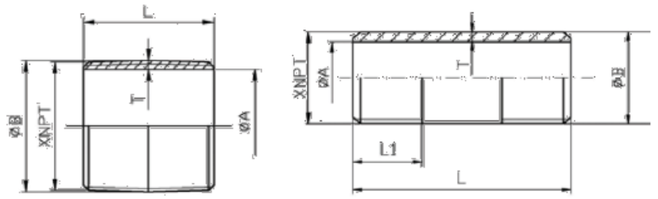
- Material - KS D 3507 / JIS G 3452 -Schedule 20, KS D / JIS G - Above Schedule 40, KS D 3576, JIS G 3459
- Dimensions & Ends conforms to KS B 1533 / JIS B2302
- Threads conforms to KS B 0222 / JIS B 0203
- RoHS Compliant
- Certified Korean Standard by KSA

Stainless Steel Pipe Nipples
| Standard - ASTMA733

Carbon Steel Pipe Nipples
| THREAD SPECIFICATIONS ANSI B1. 20. 1

Stainless Steel Nipple (304/316L)

Steel Nipple



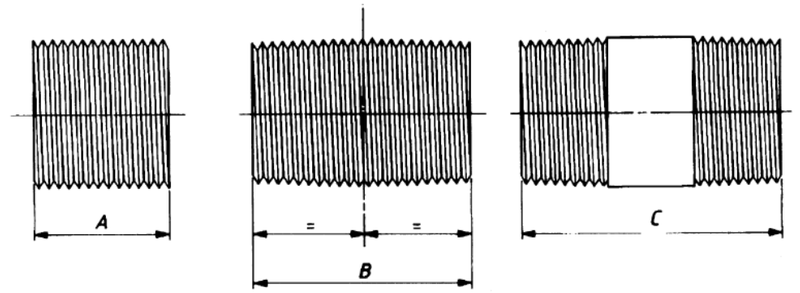
DIMENSIONS (Inch)

SIZE / Pipe	A	B	L1	T	Close L	Length														
1/8	0.285	0.405	0.3924	0.06	3/4	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
1/4	0.386	0.54	0.5946	0.077	7/8	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
3/8	0.515	0.675	0.6006	0.08	1	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
1/2	0.65	0.84	0.7815	0.095	1-1/8	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
3/4	0.852	1.05	0.7935	0.099	1/3/8	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
1	1.083	1.315	0.9845	0.116	1/1/2		2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
1-1/4	1.414	1.66	1.0085	0.123	1-5/8		2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
1/1/2	1.646	1.90	1.0252	0.127	1-3/4		2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
2	2.105	2.375	1.06	0.135	2			2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
2/1/2	2.519	2.875	1.57	0.178	2-1/2				3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
3	3.122	3.50	1.63	0.189	2-5/8				3	3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
4	4.086	4.50	1.73	0.207	2-7/8					3-1/2	4	4-1/2	5	5-1/2	6	7	8	9	10	11	12
6	6.135	6.625	1.95	0.245	3-1/8										6	7	8	9	10	11	12

- Material - ASTM A312/312M (Stainless Steel) ASTM A53/53M (Carbon Steel)
- Dimensions & Ends conforms to ASTM A733
- Threads conforms to ASME B1. 20. 1
- RoHS Compliant
- Certified Korean Standard by KSA / KC by KIWATEC / ISO 9001 : 2015

Stainless Steel Pipe Nipples
| Standard - BS1387/DIN2440

Carbon Steel Pipe Nipples
| THREAD - BS21 / DIN 2999 / ISO 7/1



(a) Running nipple (parallel thread)

(b) Close taper nipple (taper thread both ends)

(c) Barrel nipple (taper thread both ends)

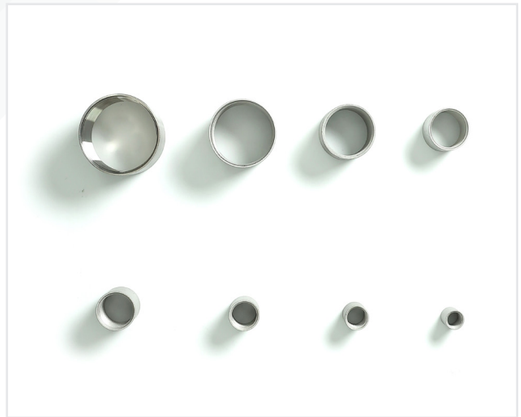
SIZE		Threaded Tube DIN2440		Threaded Tube BS 1387					Length	
		O.D.	Wall thickness	O.D. B, mm		Wall thickness S, mm			Parallel nipples	Barrel/Taper nipples
DN	inch	B, mm	S, mm	Light	Medium /Heavy	Light	Medium	Heavy	L,mm	L, mm
6	1/8	10.2	2	10.2	10.2	1.6	2		16	30mm – 2500mm
8	1/4	13.5	2.35	13.6	13.9	1.8	2.3	2.9	18	30mm – 2500mm
10	3/8	17.2	2.35	17.1	17.4	1.8	2.3	2.9	22	30mm – 2500mm
15	1/2	21.3	2.65	21.4	21.7	2	2.6	3.2	25	30mm – 2500mm
20	3/4	26.9	2.65	26.9	27.2	2.3	2.6	3.2	30	30mm – 2500mm
25	1	33.7	3.25	33.8	34.2	2.6	3.2	4	35	30mm – 2500mm
32	1 1/4	42.4	3.25	42.5	42.9	2.6	3.2	4	38	30mm – 2500mm
40	1 1/2	48.3	3.25	48.4	48.8	2.9	3.2	4	38	30mm – 2500mm
50	2	60.3	3.65	60.2	60.8	2.9	3.6	4.5	45	30mm – 2500mm
65	2 1/2	76.1	3.65	76	76.6	3.2	3.6	4.5	55	30mm – 2500mm
80	3	88.9	4.05	88.7	89.5	3.2	4	5	60	30mm – 2500mm
100	4	114.3	4.5	113.9	114.9	3.6	4.5	5.4	70	30mm – 2500mm
125	5	139.7	4.85		139.7		5	5.4	85	30mm – 2500mm
150	6	165.1	4.85		165.1		5	5.4	100	30mm – 2500mm

- Material - For Running/Parallel Nipples, Seamless or welded steel tubes according to DIN2441, For Barrel/Taper Nipples, seamless or welded steel tubes DIN2440,
- Thread - Running Nipples, DIN259; Barrel Nipples, DIN 2999.
- Finish - Black, Galvanized and Hot-Dipped

Threaded Couplings (Sockets)

| Material - Carbon Steel and Austenitic Stainless Steel

Carbon Steel - Black & White



Austenitic Stainless Steel

Unit : mm

Standard		KS B 1533				JIS B2302		BS1387		Thread	ASTM A865		ANSI C80.1(UL-6)		Thread
		CARBON		SUS 304		SOCKET		SOCKET			SOCKET		Conduit		
A	B(Inch)	OD	L	OD	L	OD	L	OD	L		OD	L	OD	L	
6	1/8	14.0	17	12.5	17	14.0	17	-	-	28	14.3	19.1	-	-	27
8	1/4	18.5	25	17.0	25	18.5	25	18.5	27	19	18.3	28.6	-	-	18
10	3/8	21.3	26	20.5	26	21.3	26	22.0	28	19	22.3	28.6	22.2	32.9	18
15	1/2	26.4	34	24.5	34	26.4	34	27.0	37	14	27.0	38.1	25.7	41.3	14
20	3/4	31.8	36	30.5	36	31.8	36	32.5	39	14	33.4	39.7	31.8	41.7	14
25	1	39.5	43	37.5	43	39.5	43	39.5	46	11	40.0	49.3	38.7	50.0	11 1/2
32	1 1/4	48.3	48	46.4	48	48.3	48	49.0	51	11	48.3	50.8	47.5	51.6	11 1/2
40	1 1/2	54.5	48	52.4	48	54.5	48	56.0	51	11	55.9	50.8	54.7	52.4	11 1/2
50	2	66.3	56	65.0	56	66.3	56	68.0	60	11	69.9	52.4	67.3	54.0	11 1/2
65	2 1/2	82.0	65	80.0	65	82.0	65	84.0	69	11	82.6	77.8	82.6	81.0	8
80	3	95.0	71	92.0	71	95.0	71	98.0	75	11	101.6	81.0	98.3	84.1	8
100	4	122.0	83	120.0	83	122.0	83	124.0	87	11	127.0	87.4	123.8	89.3	8
125	5	147.0	92	145.0	92	147.0	96	151.0	96	11	159.9	93.7	152.4	100.4	8
150	6	174.0	92	173.0	92	174.0	96	178.0	96	11	187.7	100.5	182.9	108.0	8

* The dimensions in the table above indicate the minimum size

Standards	Threads	MATERIAL
ASTM A 865	ANSI B 1. 20. 1	ASTM A312/312M, A53
JIS B 2302	JIS B 0203	JIS G3452, G3459
KS B 1533	KS B 0222	KS D3562, KS D 3576
DIN 2986	DIN 2999	DIN 2440
BS 1387	BSPT, ISO 7/1	ISO 65

Butt Welding Pipe Fitting

| Austenitic Stainless Steel Pipe (SCH.10 ~ SCH.20 / 304)

ELBOW

Long Radius 90 Degree

Short Radius 45 Degree

REDUCER

Eccentric: RE

Concentric Reducers : RC

Tee

Cap

Related Standard
ANSI B16.9
ANSI B16.25
ANSI B16.28
BS / EN10253 1~3
DIN 2605
DIN 2615
DIN 2616
DIN 2617

Pipe Threads

| Whitworth Pipe Threads

Using Whitworth pipe threads it has to be distinguished between those threads which are thought to be sealing on the thread and those which produce a mechanical connection without sealing function.

Those threads which are sealing on the thread are specified in various national and international standards. Basic thread dimensions are common for all threads mentioned below. ISO 7/1 and BS 21 do not only specify the connection of cylindrical internal and taper external thread as DIN 2999 does, but in addition define a taper internal thread (taper 1 : 16). Gauging systems for all three threads differ and may lead to different results and decisions.

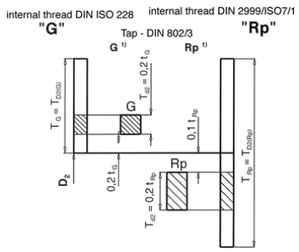
The thread connection given in DIN ISO 228 is not meant to be sealing on the thread. Basic thread dimensions and pitch is common to the sealing threads.

1	standard	**4**	internal-/ external thread
2	title of standard	**5**	short sign for thread
3	kind of connection	**6**	kind of gauges

1	**ISO 7/1**			**DIN 2999**		**BS 21**			**DIN ISO 228 part 1** [2]
2	Pipe threads where pressure tight joints are made on the threads			Whitworth pipe threads for threaded pipes and fittings		Pipe threads for tubes and fittings where pressure tight joints are madeon the threads			Pipe threads where pressure-tight joints are not made on the threads
3	sealing on the thread			sealing on the thread		sealing on the thread			not sealing on the thread
4	internal thread cylind.	internal thread taper	external thread taper	internal thread cylindrical	external thread taper	internal thread cylind.	internal thread taper	external thread taper	internal and external thread cylindrical
5	**Rp**	**Rc**	**R**	**Rp**	**R**	**Rp**	**Rc**	**R**	**G**
6	taper limit plug gauge - ISO 7/2 [1]		taper limit ring gauge - ISO 7/2 [1]	taper limit plug gauge - DIN 2999-4	cylindrical limit ring gauge - DIN 2999-5	taper limit plug gauge - BS 21		taper limit ring gauge - BS 21	cylindrical Go / No Go plug gaugecyl. Go ring gauge tolerance A or B DIN ISO 228 part 2

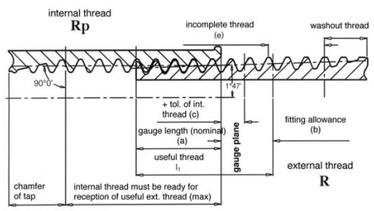
1. Standard ISO 7/2 specifying the appropriate gauges is subject to general revision.
2. DIN ISO 228 has replaced **DIN 259** (Whitworth pipe threads - cylindrical internal and external threads). For the cylindrical internal and external thread short sign **"R"** has been applied, which could have led to confusion, because the same short sign is used for the taper external thread of DIN 2999 or ISO 7/1. Compared to DIN ISO 228 there are no differences between the threads but some minor differences between the gauges.

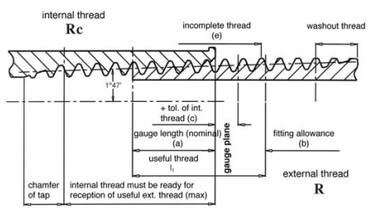
G	P [TPI]	P [mm]	Out.-Ø d = D	Pitch-Ø $d_2 = D_2$	Minor-Ø $d_1 = D_1$	Rp / Rc R	a	Tolerances of internal thread pitch-Ø [mm]	Tolerances of internal thread turns	Tolerances of external thr turns	Tolerances of external thr mm
1/16	28	0,907	7,723	7,142	7,142	**1/16**	4	±0,071	±1.1/4	±1	±0,9
1/8	28	0,907	9,728	9,147	9,147	**1/8**	4	±0,071	±1.1/4	±1	±0,9
1/4	19	1,337	13,157	12,301	12,301	**1/4**	6	±0,104	±1.1/4	±1	±1,3
3/8	19	1,337	16,662	15,806	15,806	**3/8**	6,4	±0,104	±1.1/4	±1	±1,3
1/2	14	1,814	20,955	19,793	19,793	**1/2**	8,2	±0,142	±1.1/4	±1	±1,8
5/8	14	1,814	22,911	21,749	21,749						
3/4	14	1,814	26,441	25,279	25,279	**3/4**	9,5	±0,142	±1.1/4	±1	±1,8
7/8	14	1,814	30,201	29,039	29,039						
1	11	2,309	33,249	31,770	31,770	**1**	10,4	±0,18	±1.1/4	±1	±2,3
1.1/8	11	2,309	37,897	36,418	36,418						
1.1/4	11	2,309	41,910	40,431	40,431	**1.1/4**	12,7	±0,18	±1.1/4	±1	±2,3
1.1/2	11	2,309	47,803	46,324	46,324	**1.1/2**	12,7	±0,18	±1.1/4	±1	±2,3
1.3/4	11	2,309	53,746	52,267	52,267						
2	11	2,309	59,614	58,135	58,135	**2**	15,9	±0,18	±1.1/4	±1	±2,3
2.1/4	11	2,309	65,710	64,231	64,231						
2.1/2	11	2,309	75,184	73,705	73,705	**2.1/2**	17,5	±0,217	±1.1/2	±1.1/2	±3,5
2.3/4	11	2,309	81,534	80,055	80,055						
3	11	2,309	87,884	86,405	86,405	**3**	20,6	±0,217	±1.1/2	±1.1/2	±3,5
3.1/2	11	2,309	100,330	98,851	98,851						
4	11	2,309	113,030	111,551	111,551	**4**	25,4	±0,217	±1.1/2	±1.1/2	±3,5



Tolerances for internal Whitworth pipe threads and tap

1) Hahnreiter taps are being produced with closer tolerance band



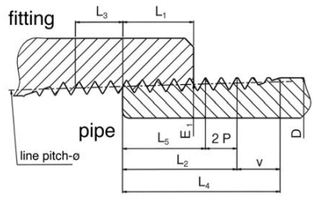


Pipe Threads

| American Pipe Threads

		pipe thread	external thread	internal thread	remarks
NPT		„general purpose"	taper	taper	
NPTF		dry sealin	taper	taper	
NPSC	C=coupling	„general purpose"	taper (NPT)	cylindrical	profile as NPT
NPSM	M=mechanical	fastening thread	cylindrical	cylindrical	UN-thread profile
NPSF		dry sealing	taper (NPTF)	cylindrical	profile as NPTF
NPSI		dry sealing	taper (NPT-SAE / NPTF)	cylindrical	thread diameter slightly increased with, same width of tolerance field
NPSL	L=Locknut		cylindrical	cylindrical	

NPT-, NPSC-, NPSM- and NPSL-thread are defined in ANSI/ASME B1.20.1, NPTF, NPSF and NPSI-thread are given in ANSI B1.20.3

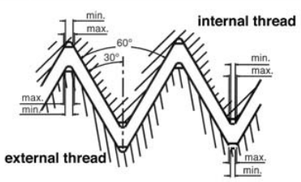
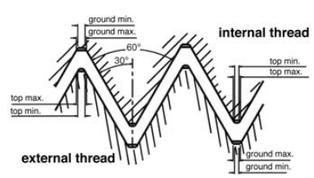


portrayal of NPT-thread

NPT	D	P	P	E_1	L_1	L_1	L_2	L_3 (3Turns)	L_5
	[mm]	[TPI]	[mm]	Ø-pitch	[mm]	[Gg]	[mm]	[mm]	[mm]
1/16	7,938	27	0,941	7,142	4,064	4,32	6,632	2,822	4,750
1/8	10,287	27	0,941	9,489	4,102	4,36	6,703	2,822	4,821
1/4	13,716	18	1,411	12,487	5,786	4,10	10,206	4,234	7,384
3/8	17,145	18	1,411	15,926	6,096	4,32	10,358	4,234	7,536
1/2	21,336	14	1,814	19,772	8,128	4,48	13,556	5,443	9,929
3/4	26,670	14	1,814	25,117	8,611	4,75	13,861	5,443	10,234
1	33,401	11,5	2,209	31,461	10,16	4,60	17,343	6,627	12,924
1.1/4	42,164	11,5	2,209	40,218	10,668	4,83	17,953	6,627	13,536
1.1/2	48,260	11,5	2,209	46,287	10,668	4,83	18,377	6,627	13,960
2	60,325	11,5	2,209	58,325	11,074	5,01	19,215	6,627	14,798
2.1/2	73,025	8	3,175	70,159	17,323	5,46	28,892	6,350	22,542
3	88,900	8	3,175	86,068	19,456	6,13	30,480	6,350	24,130
3.1/2	101,600	8	3,175	98,776	20,853	6,57	31,750	6,350	25,400
4	114,300	8	3,175	111,433	21,438	6,75	33,020	6,350	26,670

D	outside-Ø of pipe	L_3	wrenching allowance
E_1	pitch-Ø at length L	L_4	length of external thread
L_1	position of handtight engagemen	L_5	external thread with complete thread profile (on the length of 2 P beyond L_5 external thread profile is incomplete at the top of the threads because the cone of thread profile meets the cylindrical outside diameter of the pipe)
L_2	useful external thread	**v**	incomplete thread produced by the chamfer of thread cutting tool

The difference between thread profile of **NPT** and **NPTF** threads is the width of flat of profile on the outside and minor diameter. **NPTF** thread has got an overlap of profiles of internal and external thread. By this method, drysealing property is achieved. Compared to the **NPT, NPTF** is one thread longer on $L_1 + L_3$ and L_2.

P [TPI]	NPT				NPTF			
								
	width of flat of profile		height of profile		width of flat of profile			
					ground		top	
	min.	max.	min.	max.	min.	max.	min.	max.
27	0,036	0,104	0,634	0,753	0,102	0,152	0,051	0,102
18	0,053	0,145	0,974	1,129	0,127	0,178	0,076	0,127
14	0,069	0,163	1,288	1,451	0,127	0,178	0,076	0,127
11 1/2	0,084	0,185	1,590	1,767	0,152	0,229	0,102	0,152
8	0,122	0,229	2,356	2,540	0,203	0,279	0,152	0,203