

**MODEL****TK**

## THROUGH CONDUIT KNIFE GATE VALVE

The TK model knife gate is a bi-directional wafer type valve designed for media with high consistency. The double seat design assures a non-clogging shut off on either normal or reverse flow. The valve is used in a wide range of demanding applications in industries such as:

- Pulp & Paper
- Wastewater Treatment Plants
- Chemical plants
- Power Plants
- Etc.

**Sizes:**

DN 50 to DN 900 (larger diameters on request)

**Working pressure:**

DN 50 to DN 250      10 bar  
 DN 300 to DN 900      6 bar <sup>(1)</sup>  
 (1) 8 bar with duplex gate

**Standard flange connection:** DIN PN 10 and ANSI B16.5 (class 150)

Other flange connections are available on request such as:

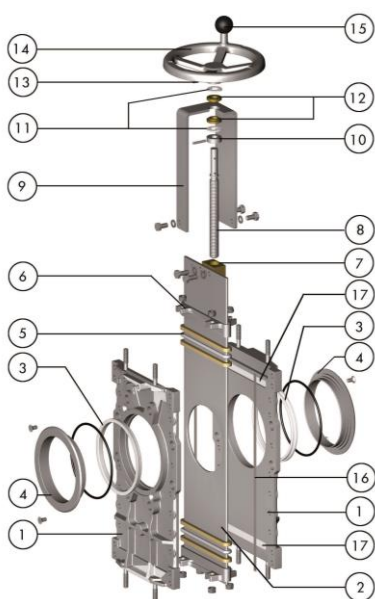
DIN PN 6                      DIN PN 16                      DIN PN 25  
 BS "D" and "E"

**Directives:** 2006/42/EC (MACHINES)  
 2014/68/EU (PED) Fluid: Group 1(b), 2 (Cat. I, mod. A)  
 2014/34/EU (ATEX)

All valves are tested prior to shipping in accordance with the standard developed by the Quality Control Department at ORBINOX



### STANDARD PARTS LIST



Part:	Material:
1- Body	CF8M (1.4408)
2- Gate	AISI 316 (1.4401)
3- Seat	PTFE + O ring
4- "K" Ring	CF8M (1.4408)
5- Packing	Dynapack (Graphite impregnated PTFE and Aramid yarn combination with an elastomeric core) + (EPDM O-ring)
6- Gland Follower	CF8M (1.4408)
7- Stem nut	Brass
8- Stem	Stainless Steel
9 - Yoke	AISI 304 (1.4301)
10- Axial fixing bush	AISI 304 (1.4301)
11- Friction washer	PET + solid lubricant
12- Bushing	Bronze
13- Spring Pin	AISI 420 (1.4021) (ISO 8752)
14- Handwheel	Ø≤310: Aluminium (AlSi12) / Ø≥410 GJS400 (GGG40)
15- Knob	Black bakelite
16- Gasket	DN 80-200: Graphite / DN 250-900: NBR
17- Sliders	Glass filled PTFE

## DESIGN FEATURES

### BODY:

Wafer style cast two-part bolted body, both internally machined, with reinforcing ribs in larger diameters for extra body strength. With internal glass filled PTFE sliders that ensure smoother gate traveling. Full port design to allow a greater flow capacity and to guarantee a minimal pressure drop.

### SELF-CLEANING GATE:

Stainless steel as standard. One piece through-going gate with o-port design. When closing, the gate cuts and moves a disc of material downwards, which is again returned to the flow when opening. Gate is polished on both sides to avoid jamming and to ensure a greater seal between the gate with both packing and seat. The material of the gate can be changed on request for higher pressure requirements.

### SEAT:

Unique design that mechanically locks the seal in the interior of the valve body with a cast, easy to replace, stainless steel seat ring. Standard PTFE + NBR O-ring (Fig.1)

### PACKING:

Long-life packing with several graphite impregnated PTFE and Aramid yarn combination with an elastomeric core, with an easy access packing gland ensuring a tight seal. Long-life braided packing is available in a wide range of materials.

### STEM:

The standard stainless Steel stem offers a long corrosion resistant life. Standard configuration is nonrising stem.

For those pneumatic actuated valves, stem linkage is provided by means of a stainless steel coupling and a pin (Fig. 2).

### ACTUATORS:

All actuators supplied by ORBINOX are interchangeable, and supplied with a standard mounting kit for installation purposes on site.

### YOKE or ACTUATOR SUPPORT:

Made of stainless steel (EPOXY coated steel available on request). Compact design makes it extremely robust even under the most severe conditions.

### EPOXY COATING:

The epoxy coating on all ORBINOX cast iron and carbon steel components is electrostatically applied, making the valves corrosion-resistant with a high quality finished surface. The ORBINOX standard colour is RAL-5015 blue.

### GATE SAFETY PROTECTION:

ORBINOX automated valves are provided with gate guards in accordance with EU Safety Standards. The design feature prevents any objects from being caught accidentally while the gate is moving.



Fig.1



Fig. 2

## OTHER OPTIONS

### Gate guards for actuators with proximity switches:

Allows horizontal and parallel mounting of the proximity switches including their protection

### Bonnet:

Assures tight sealing to atmosphere if used with hazardous gas or fluids.

Reduces packing maintenance

### Diamond port:

Excellent flow regulation

### Flush ports:

Allow for cleaning of solids trapped within the body cavities that can obstruct the flow or prevent the valve from closing. Purging can be made with air, steam, liquids, etc. depending on the process

### Other materials of construction:

Special alloys such as AISI 317 (1.4449), 254SMO (1.4547), Hastelloys, etc.

### Fabricated valves:

ORBINOX designs, produces and delivers special fabricated valves for special process conditions (big sizes and/or high pressures)

## SURFACE TREATMENTS

Valve components can be protected or coated for a longer life expectancy, depending on the application of the valves and the valve service conditions.

At ORBINOX we can offer alternative treatments and coatings for the different valve components to improve their properties against abrasion (Stellite, polyurethane...), against corrosion (Halar, Rilsan, galvanizing...) and against adherence (polishing, PTFE...)

## ATEX



Please contact an ORBINOX representative for info and availability. Some considerations:

- Hand operated TK valves have been subjected to an ignition risk assessment according to DIN EN 13463: 1-5 and they are out the scope of application of ATEX Directive. Therefore hand operated valves are suitable for ALL ATEX zones
- Electrical, pneumatical and hydraulically operated valves must be subjected to a conformity assessment of their own and also of the whole unit valve-actuator to get EC Type Approval to Directive 2014/34

## ACTUATOR TYPES

### MANUAL:

Handwheel (rising & non-rising stem)  
 Chainwheel  
 Lever  
 Bevel Gear  
 Others (square nut...)

### AUTOMATIC:

Electric (rising & non-rising stem)  
 Pneumatic (single & double-acting)  
 Hydraulic



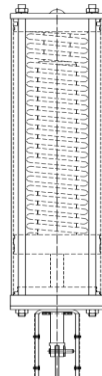
All actuators supplied by ORBINOX are interchangeable

## FAIL SAFE SYSTEMS

Used on pneumatic actuated valves

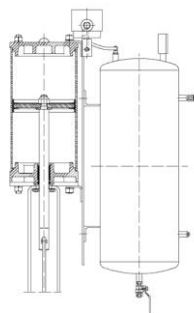
### SINGLE ACTING (SPRING RETURN)

- Available from DN 50 to DN 300
- Supply pressure:  
min. 5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



### DOUBLE ACTING WITH AIR TANK

- Available for all valve sizes
- Supply pressure:  
min. 3.5 bar - max. 10 bar
- Options:
  - Pneumatic or electric fail open
  - Pneumatic or electric fail close
  - Other options on request



## ACCESSORIES

Mechanical stops  
 Locking device (Fig.1)  
 Manual override  
 Solenoid valves  
 Positioners  
 Limit switches  
 Proximity switches  
 Floor stands  
 Extensions (Fig.2)

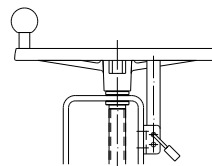


Fig.1

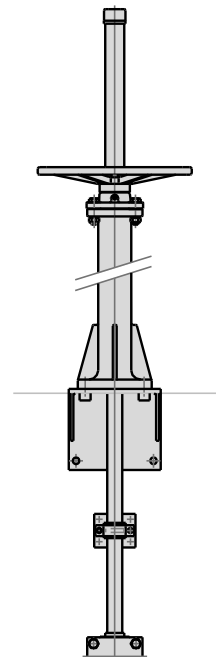


Fig. 2

*For further information about fail safe systems and valve extensions, see EX catalogue*

For more detailed information, please contact our Technical Department

**TEMPERATURE CHART**

**SEAT / SEALS**

**PACKING**

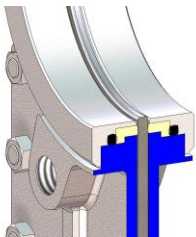
Material	Max.Temp.(°C)	Applications
PTFE (T) + O-ring*		
*NBR (N)	120	Corrosion resistance (1)
*FKM-FPM (V)	200	Corrosion resistance
*VMQ (S)	250	Corrosion resistance
Polyurethan (PU)	90	Abrasion resistance
EPDM (E)	120	Acids and non mineral oils
NBR (N)	120	Resistance to petroleum products
FKM-FPM (V)	200	Chemical service/High temp.

Material	Max.Temp.(°C)	pH
Dynapack (DP)	270	2-14
Braided PTFE (TH)	260	0-14
Graphited (GR)	600	0-14
Ceramic fibre (FC)	1200	--

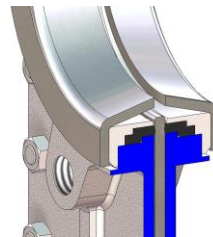
NOTE: all types include an elastomere O-ring

(1) PTFE + NBR O-ring standard ORBINOX arrangement

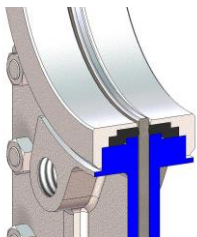
**SEAT TYPES**



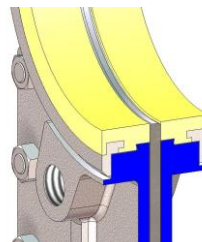
- TYPE "K" SEAT (PTFE)**
- Replaceable resilient PTFE + O-ring seats
  - Replaceable stainless steel rings



- DEFLECTION CONE "C"**
- Deflects the media away from any valve internal exposed parts (gate guides, seat,...)
  - Material: AISI 316, CA15, Ni-Hard, etc.
  - Face-to-face dimension increases:  
DN 50 to DN 250 X = 9mm  
DN 300 to DN 600 X = 12mm  
Larger diameters on request



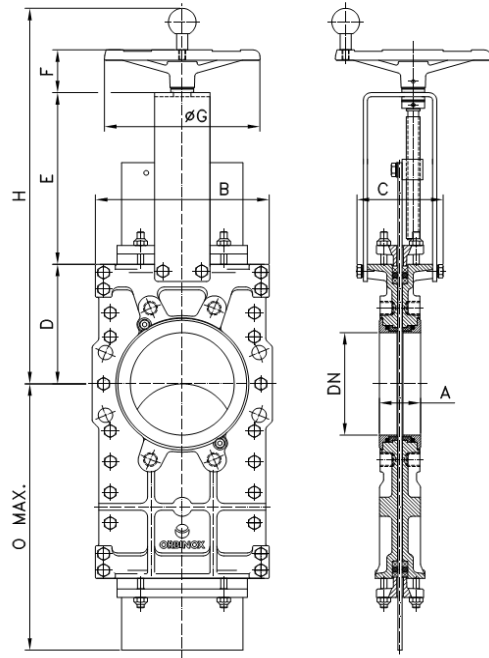
- TYPE "K" SEAT (EPDM)**
- Standard replaceable resilient EPDM seats
  - Replaceable stainless steel rings



- POLYURETHANE**
- Replaceable polyurethane seat ring.

**HANDWHEEL (non-rising stem)**

- Standard manual actuator:
  - DN 50-300: Aluminium handwheel
  - DN $\geq$ 350: GJS400 handwheel
- Recommended for installation where space is limited
- Consists of:
  - Handwheel with knob
  - Stem
  - Yoke bushing
  - Stem nut fixed to the gate
- Available from DN 50 to DN 600
- Options:
  - Locking Device
  - Extension
  - Square Nut Drive
- Gear is recommended above DN350



DN	A	B	C	D	E	F	ØG	H	O max.	Weight (kg.)
50	41	152	125	110	144	63	225	317	232	12
65	41	167	125	115	161	63	225	339	255	14
80	51	192	125	124	177	63	225	425	312	17
100	51	212	125	140	202	63	225	466	367	22
125	56	226	125	150	226	63	225	500	432	31
150	60	251	125	175	252	63	225	551	497	37
200	60	304	142	205	317	73	310	656	637	75
250	69	366	142	245	372	73	310	756	777	100
300	78	425	142	280	422	73	310	856	907	170
350	78	483	197	320	515	98	410	994	1047	200
400	89	543	197	350	559	98	410	1068	1171	290
450	89	588	201	420	611	98	550	1190	1301	326
500	114	740	320	485	671	98	550	1315	1573	750
600	122	836	320	530	771	98	550	1460	1830	790

## GEAR (non-rising stem)

- Recommended for valves larger than DN 350 and working pressures greater than 3.5 bar

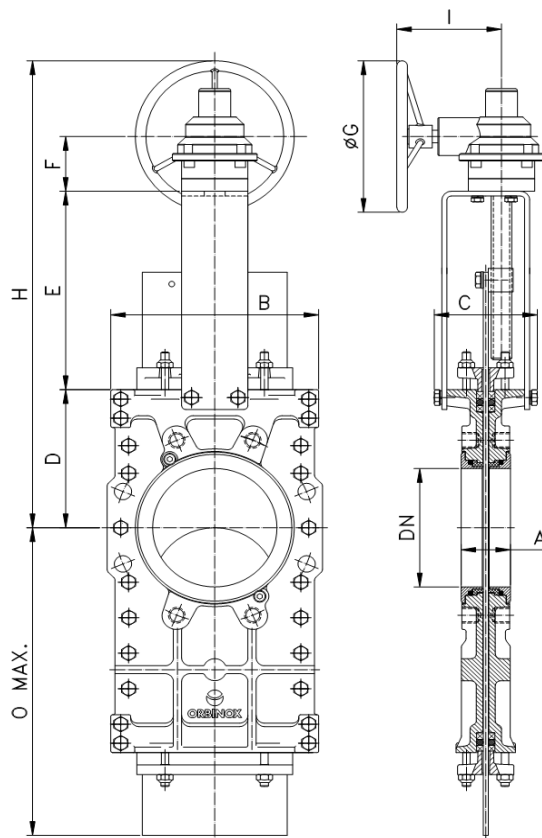
- Consists of:

- Stem
- Yoke
- Bevel Gear Actuator with Handwheel (Standard Ratio 4:1)

- Available from DN 200 to DN 900

- Options:

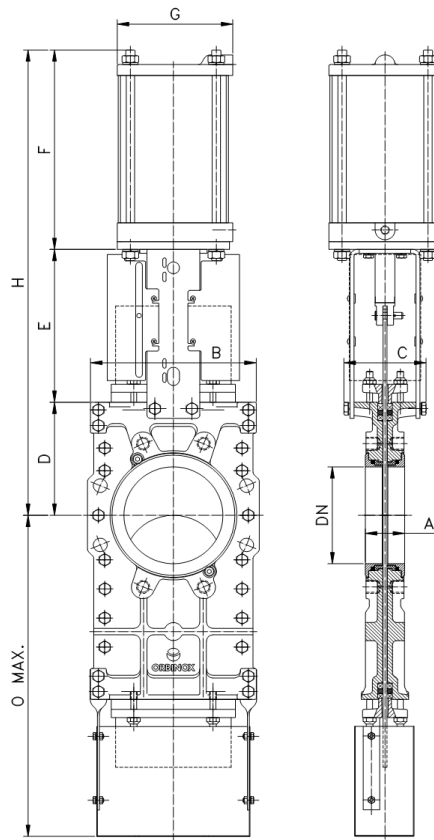
- Locking Device
- Extension
- Chainwheel



DN	A	B	C	D	E	F	ØG	H	I	O max.
200	60	304	125	205	309	109	300	773	200	637
250	69	366	125	245	364	109	300	868	200	777
300	78	425	125	280	423	109	300	962	200	907
350	78	483	197	320	486	109	450	1120	270	1047
400	89	543	197	350	536	109	450	1220	270	1171
450	89	588	201	420	588	109	450	1342	270	1301
500	114	740	320	485	649	109	450	1468	270	1573
600	122	836	320	530	748	109	450	1612	270	1830
700	128	960	320	650	855	109	450	1939	270	2005
800	128	1030	320	630	955	109	650	2129	270	2340
900	128	1170	320	775	1055	109	650	2334	320	2595

**PNEUMATIC CYLINDER**

- The standard pneumatic actuator (double acting on-off cylinder) consists of:
  - $\varnothing \leq 300$ : Aluminum barrels
  - $\varnothing \geq 350$ : Composite barrels
  - Aluminium covers
  - Stainless Steel (AISI 304) piston rod
  - Nitrile coated steel piston
- Available from DN 50 to DN 900
- Supply Pressure: min. 3.5 bar - max. 10 bar. Actuator designed with 6 bar air supply and for standard catalogue differential pressure
- For valves installed in a horizontal position, we recommend U-type support plates and/or actuator support
- Options:
  - Gate guards for proximity switches
  - Hard anodized barrel and covers
  - Stainless Steel barrel and covers
  - Over / Undersized cylinder
  - Manual override
  - Fail Safe System
  - Limit switches
- Instrumentation (on request):
  - Positioners            - Solenoid valves
  - Flow regulators    - Air preparation units

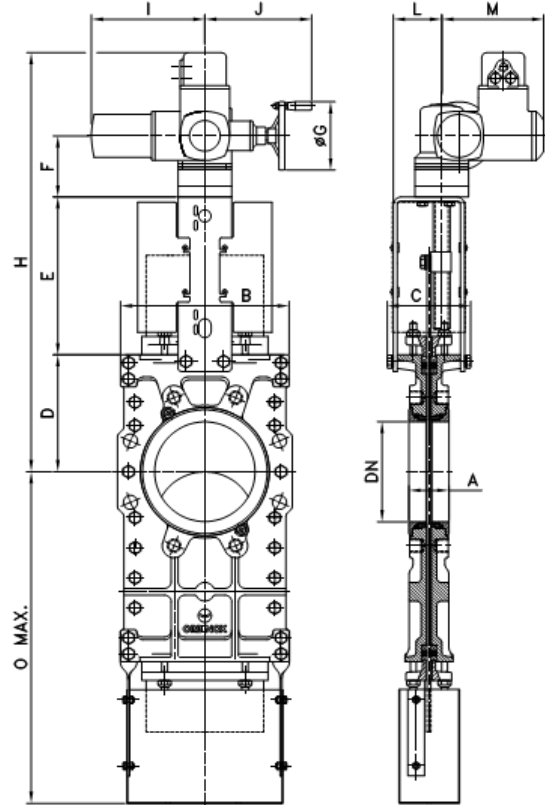


DN	A	B	C	D	O max.	E	F	G	H	Weight (kg.)	Standard Cyl.	Connect.
50	41	152	100	110	232	129	178	115	417	14	C100/62	1/4" G
65	41	167	100	115	255	146	193	115	454	16	C100/77	1/4" G
80	51	192	125	124	312	162	211	115	497	19	C100/95	1/4" G
100	51	212	125	140	367	187	231	115	558	25	C100/115	1/4" G
125	56	226	125	150	432	211	271	140	632	36	C125/143	1/4" G
150	60	251	125	175	497	237	310	175	722	43	C160/168	1/4" G
200	60	304	142	205	637	309	358	175	872	86	C160/220	1/4" G
250	69	366	185	245	777	364	428	220	1037	116	C200/270	3/8" G
300	78	425	185	280	907	414	478	220	1172	188	C200/320	3/8" G
350	78	483	270	320	1047	520	549	220	1389	233	C200/375	3/8" G
400	89	543	270	350	1171	577	599	277	1526	324	C250/425	3/8" G
450	89	588	270	420	1301	608	680	382	1708	378	C250/475	3/8" G
500	114	740	320	485	1573	671	692	382	1848	800	C300/525	1/2" G
600	122	836	320	530	1830	760	880	444	2170	960	C300/625	1/2" G
700	128	960	320	650	2005	855	980	444	2485	2000	C350/730	3/4" G
800	128	1030	320	630	2340	1085	1090	444	2805	2600	C400/830	3/4" G
900	128	1170	320	775	2595	1298	1197	515	3270	3200	C400/930	3/4" G



**ELECTRIC ACTUATOR (non-rising stem)**



- Consists of:
  - Electric motor
  - Motor support yoke  
acc. to ISO 5210/DIN 3338
- The standard electric motor is equipped with:
  - Manual emergency operation
  - Limit switches (open/closed)
  - Torque switches
- Available from DN 50 to DN 900
- For valves installed in a horizontal position, we recommend U-type support plates and/or actuator support
- Wide range of types and brands available to meet customer's needs

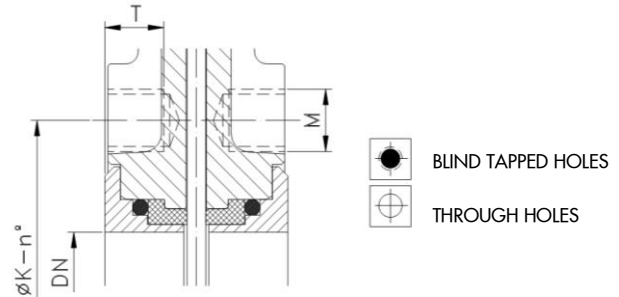
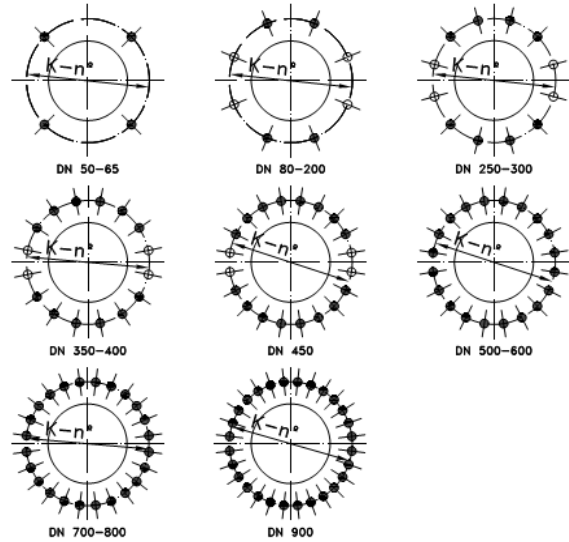


DN	A	B	C	D	E	F	ØG	H	O max.	I	J	L	M	stem Ø x pitch	Torque (Nm)
50	41	152	125	110	129	143	160	592	232	265	249	72	238	20 x 3	10
65	41	167	125	115	146	143	160	614	255	265	249	72	238	20 x 3	10
80	51	192	125	124	162	143	160	639	312	265	249	72	238	20 x 3	10
100	51	212	125	140	187	143	160	680	367	265	249	72	238	20 x 3	10
125	56	226	125	150	211	143	160	714	432	265	249	72	238	20 x 3	15
150	60	251	125	175	237	143	160	765	497	265	249	72	238	20 x 3	30
200	60	304	142	205	309	143	160	867	637	265	249	82	238	25 x 4	40
250	69	366	185	245	364	155	200	979	777	283	254	82	248	25 x 4	65
300	78	425	185	280	414	155	200	1059	907	283	254	82	248	25 x 4	70
350	78	483	270	320	520	155	200	1180	1047	283	254	128	248	35 x 6	110
400	89	543	270	350	577	158	315	1273	1171	389	336	130	286	35 x 6	140
450	89	588	335	420	608	158	315	1401	1301	389	336	130	286	35 x 6	180
500	114	740	320	485	671	158	315	1656	1573	389	336	130	286	35 x 6	210
600	122	836	320	530	760	158	315	1641	1830	389	336	130	286	35 x 6	300
700	128	960	320	650	855	175	500	1885	2005	389	340	190	286	40 x 7	500
800	128	1030	320	630	955	175	500	2105	2340	389	340	190	286	60 x 9	500
900	128	1170	320	775	1055	210	500	2375	2595	510	355	190	330	60 x 9	650



**FLANGE AND BOLTING DETAILS**

**EN 1092-2 PN10**

DN	K	n°	M	T	 
50	125	4	M-16	11	4 - 0
65	145	4	M-16	11	4 - 0
80	160	8	M-16	15	4 - 4
100	180	8	M-16	16	4 - 4
125	210	8	M-16	18	4 - 4
150	240	8	M-20	19	4 - 4
200	295	8	M-20	18	4 - 4
250	350	12	M-20	21	8 - 4
300	400	12	M-20	27	8 - 4
350	460	16	M-20	23	12 - 4
400	515	16	M-24	28	12 - 4
450	565	20	M-24	32	16 - 4
500	620	20	M-24	28	20 - 0
600	725	20	M-27	28	20 - 0
700	840	24	M-27	32	24 - 0
800	950	24	M-30	32	24 - 0
900	1050	28	M-30	32	24 - 0



**ANSI B16.5, class 150**

DN	K	n°	M	T	 
2"	4 3/4"	4	5/8" - 11 UNC	7/16"	4 - 0
2 1/2"	5 1/2"	4	5/8" - 11 UNC	7/16"	4 - 0
3"	6"	4	5/8" - 11 UNC	9/16"	4 - 0
4"	7 1/2"	8	5/8" - 11 UNC	9/16"	4 - 4
5"	8 1/2"	8	3/4" - 10 UNC	9/16"	4 - 4
6"	9 1/2"	8	3/4" - 10 UNC	11/16"	4 - 4
8"	11 3/4"	8	3/4" - 10 UNC	11/16"	4 - 4
10"	14 1/4"	12	7/8" - 9 UNC	7/9"	8 - 4
12"	17"	12	7/8" - 9 UNC	1"	8 - 4
14"	18 3/4"	12	1" - 8 UNC	7/9"	8 - 4
16"	21 1/4"	16	1" - 8 UNC	1 1/8"	12 - 4
18"	22 3/4"	16	1 1/8" - 7 UNC	7/9"	12 - 4
20"	25"	20	1 1/8" - 7 UNC	1 1/8"	20 - 0
24"	29 1/2"	20	1 1/4" - 7 UNC	1 1/8"	20 - 0
28"	34"	28	1 1/4" - 7 UNC	1 1/4"	28 - 0
32"	38 1/2"	28	1 1/2" - 6 UNC	1 1/4"	28 - 0
36"	42 3/4"	32	1 1/2" - 6 UNC	1 1/4"	32 - 0

