

SERIES A, CLASS 150

Flange Size, NPS	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	2.69	2.81	2.94	3.18	3.25	3.56	3.44	3.56	3.81	4	4.06	4.25	4.38	4.56	4.75	4.88	5.06	5.19
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.25	1.25	1.25	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.75	1.75	1.75	1.75	1.75	1.75
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	8.505	8.745	9.005	9.985	10.13	10.75	10.51	10.75	11.25	11.63	11.75	12.13	12.89	13.25	13.63	13.89	14.25	14.51
Quantity of studs	24	28	28	28	32	32	32	36	36	40	40	44	44	44	44	48	48	52
Stud size	1.25	1.25	1.25	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.75	1.75	1.75	1.75	1.75	1.75
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	8.755	8.995	9.255	10.24	10.38	11	10.76	11	11.5	11.88	12	12.38	13.14	13.5	13.88	14.14	14.5	14.76

Notes:

- It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)
- Add at least one stud diameter to above stud length if hydraulic tensioner is used
- Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES A, CLASS 300

Flange, NPS	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	3.13	3.38	3.63	3.88	4	4.13	4.25	4.5	4.69	4.88	5.06	5.25	5.5	5.69	6	6.06	6.25	6.44
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.625	1.625	1.75	1.875	1.875	2	1.5	1.625	1.625	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.25
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	10.14	10.64	11.39	12.14	12.38	12.89	12.13	12.88	13.26	13.89	14.5	14.88	15.63	16.01	17.13	17.25	17.63	18.01
Quantity of studs	28	28	28	28	28	32	32	32	32	32	28	32	32	32	28	28	32	32
Stud size	1.625	1.625	1.75	1.875	1.875	2	1.5	1.625	1.625	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.25
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	10.39	10.89	11.64	12.39	12.63	13.14	12.38	13.13	13.51	14.14	14.75	15.13	15.88	16.26	17.38	17.5	17.88	18.26

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES A, CLASS 400

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	3.5	3.75	4	4.25	4.38	4.5	4.88	5.13	5.25	5.5	5.75	6	6.19	6.38	6.69	6.88	7	7.31
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.75	1.875	2	2	2	2	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.5	2.5	2.5	2.75
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	11.51	12.26	13.01	13.51	13.77	14.01	14.27	15.02	15.26	16.01	16.51	17.51	17.89	18.27	19.39	19.77	20.01	21.13
Quantity of studs	28	28	28	28	28	32	32	32	32	32	36	28	32	32	28	32	32	32
Stud size	1.75	1.875	2	2	2	2	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.5	2.5	2.5	2.75
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	11.76	12.51	13.26	13.76	14.02	14.26	14.52	15.27	15.51	16.26	16.76	17.76	18.14	18.52	19.64	20.02	20.26	21.38

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES A, CLASS 600

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	4.25	4.38	4.5	4.63	4.75	4.88	6	6.25	6.63	6.81	7.06	7.44	7.75	8	8.25	8.56	8.75	9.19
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.875	2	2	2.25	2.25	2.5	2.25	2.25	2.5	2.5	2.5	2.75	3	3	3	3.25	3.25	3.5
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	13.26	13.77	14.01	14.77	15.01	15.77	17.51	18.01	19.27	19.63	20.13	21.39	22.51	23.01	23.51	24.63	25.01	26.39
Quantity of studs	28	28	28	28	28	28	28	32	28	32	32	32	28	32	32	32	32	28
Stud size	1.875	2	2	2.25	2.25	2.5	2.25	2.25	2.5	2.5	2.5	2.75	3	3	3	3.25	3.25	3.5
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	13.51	14.02	14.26	15.02	15.26	16.02	17.76	18.26	19.52	19.88	20.38	21.64	22.76	23.26	23.76	24.88	25.26	26.64

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES A, CLASS 900

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48
C, Min. Flange thickness	5.5	5.63	5.88	6.25	6.5	6.75	7.5	7.75	8.13	8.44	8.88	9.19
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	2.75	3	3	3.25	3.5	3.5	3.5	3.5	3.5	3.75	4	4
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	17.51	18.27	18.77	20.01	21.01	21.51	23.01	23.51	24.27	25.39	26.77	27.39
Quantity of studs	20	20	20	20	20	20	20	24	24	24	24	24
Stud size	2.75	3	3	3.25	3.5	3.5	3.5	3.5	3.5	3.75	4	4
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	17.76	18.52	19.02	20.26	21.26	21.76	23.26	23.76	24.52	25.64	27.02	27.64

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES B, CLASS 150

Flange, NPS	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	1.63	1.75	1.75	1.81	1.94	2.06	2.13	2.19	2.31	2.38	2.44	2.56	2.69	2.75	2.81	2.88	2.94	3
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	0.75	0.75	0.75	0.75	0.875	0.875	1	1	1	1	1.125	1.125	1.125	1.125	1.125	1.125	1.25	1.25
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	5.385	5.625	5.625	5.745	6.255	6.495	6.885	7.005	7.245	7.385	7.755	7.995	8.255	8.375	8.495	8.635	9.005	9.125
Quantity of studs	36	40	44	48	40	44	40	44	48	52	40	44	48	52	56	60	48	52
Stud size	0.75	0.75	0.75	0.75	0.875	0.875	1	1	1	1	1.125	1.125	1.125	1.125	1.125	1.125	1.25	1.25
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	5.635	5.875	5.875	5.995	6.505	6.745	7.135	7.255	7.495	7.635	8.005	8.245	8.505	8.625	8.745	8.885	9.255	9.375

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES B, CLASS 300

Flange, NPS	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	3.5	3.5	3.69	4.06	4.06	4.06	4.38	4.56	4.69	5	5.06	5.06	5.44	5.63	5.38	6.06	6.06	5.94
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.25	1.25	1.375	1.5	1.5	1.625	1.625	1.625	1.75	1.75	1.875	1.875	1.875	1.875	1.875	2.25	2.25	2.25
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	10.13	10.13	10.76	11.75	11.75	12	12.64	13	13.51	14.13	14.5	14.5	15.26	15.64	15.14	17.25	17.25	17.01
Quantity of studs	32	36	36	32	36	32	36	40	36	40	36	40	44	48	48	36	40	40
Stud size	1.25	1.25	1.375	1.5	1.5	1.625	1.625	1.625	1.75	1.75	1.875	1.875	1.875	1.875	1.875	2.25	2.25	2.25
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	10.38	10.38	11.01	12	12	12.25	12.89	13.25	13.76	14.38	14.75	14.75	15.51	15.89	15.39	17.5	17.5	17.26

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES B, CLASS 400

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	3.5	3.75	4	4.25	4.38	4.69	4.88	5.13	5.25	5.5	5.75	6	6.19	6.38	6.69	6.88	7	7.31
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.375	1.5	1.5	1.625	1.625	1.75	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.5	2.5	2.5	2.75
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	10.76	11.51	12.01	12.76	13.02	13.89	14.27	15.02	15.26	16.01	16.51	17.51	17.89	18.27	19.39	19.77	20.01	21.13
Quantity of studs	28	24	28	28	32	28	32	32	32	32	36	28	32	32	28	32	32	32
Stud size	1.375	1.5	1.5	1.625	1.625	1.75	1.75	1.875	1.875	2	2	2.25	2.25	2.25	2.5	2.5	2.5	2.75
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	11.01	11.76	12.26	13.01	13.27	14.14	14.52	15.27	15.51	16.26	16.76	17.76	18.14	18.52	19.64	20.02	20.26	21.38

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES B, CLASS 600

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
C, Min. Flange thickness	4.38	4.56	4.94	5.13	5.56	5.75	6	6.25	6.63	6.81	7.06	7.44	7.75	8	8.25	8.56	8.75	9.19
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	1.625	1.75	1.875	2	2.25	2.25	2.25	2.25	2.5	2.5	2.5	2.75	3	3	3	3.25	3.25	3.5
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	13.02	13.63	14.64	15.27	16.63	17.01	17.51	18.01	19.27	19.63	20.13	21.39	22.51	23.01	23.51	24.63	25.01	26.39
Quantity of studs	28	28	28	28	24	28	28	32	28	32	32	32	28	32	32	32	32	28
Stud size	1.625	1.75	1.875	2	2.25	2.25	2.25	2.25	2.5	2.5	2.5	2.75	3	3	3	3.25	3.25	3.5
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	13.27	13.88	14.89	15.52	16.88	17.26	17.76	18.26	19.52	19.88	20.38	21.64	22.76	23.26	23.76	24.88	25.26	26.64

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs

SERIES B, CLASS 900

Flange, NPS*	26	28	30	32	34	36	38	40	42	44	46	48
C, Min. Flange thickness	5.31	5.81	6.13	6.31	6.75	6.81	7.5	7.75	8.13	8.44	8.88	9.19
t, plus tolerance for flange thickness	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
d, heavy nut thickness	2.5	2.75	3	3	3.25	3	3.5	3.5	3.5	3.75	4	4
G, gasket final thickness	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
F, total height of facings or depth of RTJ groove	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
a, zero, except where the small female face is on the end of pipe, .19	0	0	0	0	0	0	0	0	0	0	0	0
Lcsb, calculated stud bolt effective thread length excluding end points	16.63	18.13	19.27	19.63	21.01	20.63	23.01	23.51	24.27	25.39	26.77	27.39
Quantity of studs	20	20	20	20	20	24	20	24	24	24	24	24
Stud size	2.5	2.75	3	3	3.25	3	3.5	3.5	3.5	3.75	4	4
end points	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
End to end length	16.88	18.38	19.52	19.88	21.26	20.88	23.26	23.76	24.52	25.64	27.02	27.64

* Sizes 38" and above are identical for both Series A, and B

Notes:

It is recommended to round up the stud length to the closest 1/8" fraction (Ex.: 9-3/8, 10-3/4, etc..)

Add at least one stud diameter to above stud length if hydraulic tensioner is used

Above lengths are calculated based on raised face weld neck flanges. Blind flanges or RTJ flanges may need longer studs