

## Compact Cartridge Seals

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**The Easiest Cartridge Seal Solution...Maximised!**

**4600 Series** 

# 4610

## The Best Value...Easiest-to-Install Single O-Ring Cartridge Seal



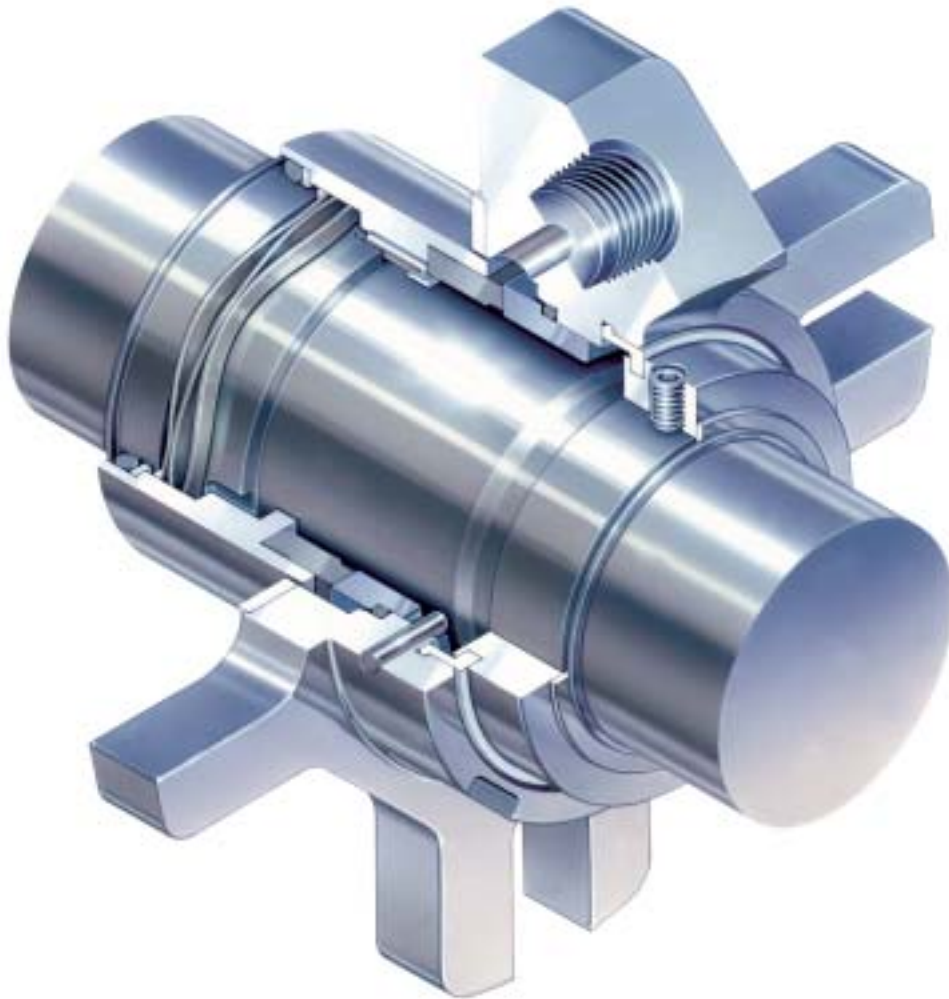
### Optimised Running Face Design

- Premium-grade carbon and silicon carbide are standard.
- Robust pin drive gives positive torque transmission.
- Hydraulically balanced for optimal performance.
- Face design optimised using proprietary computer simulation program technology.

### Nonclogging,

### Crest-to-Crest Wave Spring

- No small, easily clogged, and over-compressed helical coil springs.
- Less prone to corrosion problems.
- Uniform face loading.



### Unique Centralising Ring

- No setting clips to be removed or lost.
- Accurately sets seal axially & radially.
- Helps prevent component damage from overcompression during seal installation.

### Compact Cartridge Design

- Four-bolt gland for accurate seal setting.
- Precise investment cast gland plate design.
- Large flush connection drilling ensures optimum flow and allows seal chamber venting for horizontal and vertical applications.
- Factory preset and pressure tested assembly.

# 4620P

## The Best Value...Easiest-to-Install Dual O-Ring Cartridge Seal with Pumping Ring

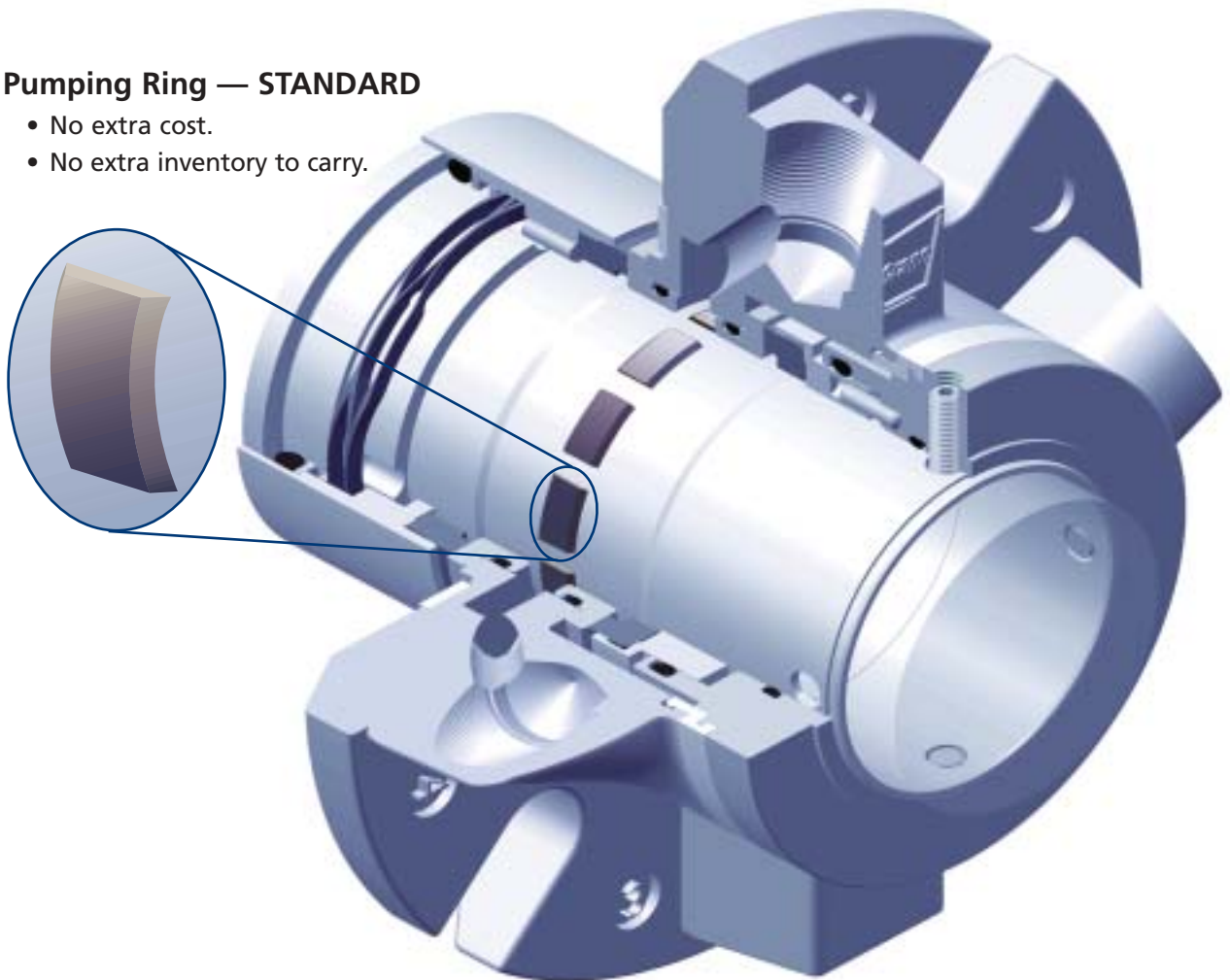


### Dual Seal Arrangement

- Incorporates an elastomer O-ring as the dynamic secondary sealing member.
- Inboard primary and mating ring reverse balance design allows for ID or OD pressurisation, permitting the dual seal to operate as an unpressurised tandem or pressurised double seal.
- Positive seal face closing forces are maintained in an upset pressure reversal situation, providing maximum safety and process containment.

### Pumping Ring — STANDARD

- No extra cost.
- No extra inventory to carry.



CUT LINE FOR SHORT PAGE

### Flow-Optimised Design

- Integral pumping ring arrangement.
- Tangential piping ports.
- Standard configuration provides increased cooling flow and face lubrication, greatly extending seal life.

### Cartridge Design

- Factory-preset and pressure-tested assembly.
- The only dual cartridge design with centralising ring eliminating need for external setting clips.
- Eliminates potential assembly and installation errors.
- Increases pump reliability and process efficiency.

# 4600 Series

## Cartridge Seal Solution



**High-quality, innovative design reduces installation and maintenance costs for general industrial applications**

**John Crane combines proven technologies for optimal performance.**

The 4600 series cartridge seal is the complete affordable solution for liquid sealing satisfaction in industrial applications.

Type 4600 series meets key industry pump standards, and is designed to permit use in rotating shaft equipment including ANSI/DIN pumps, close-coupled pumps, vertical pumps, and similar rotating shaft equipment.

**The 4600 Series outperforms — in every way — all other seals in its class — without exception!**

Exceptionally reliable single (4610) or dual (4620P) mechanical seal for traditionally packed equipment and other applications.

It reduces:

- Wasteful Leakage
- Costly Equipment Damage
- Inefficient Pump Downtime
- Time-Consuming Maintenance Problems

Installation is fast and fool-proof. The 4600 series design allows it to fit the most popular metric and inch pumps without modification.

### Key Markets

- Water & Wastewater
- Pulp & Paper
- Power Generation
- Chemical
- Food & Beverage
- Pharmaceutical
- Mining
- Steel Production
- General Industrial

The 4600 series cartridge seal is the most affordable sealing solution available. Low cost, ease of installation, and long life are just a few of the benefits you can expect when you purchase a 4600 Series seal.



**No measuring, no clips, no surprises... just affordable reliability from the world's leading seal manufacturer.**



# Maximum Pressure Limits

Single Type 4610 / Tandem Type 4620P*
Process Pressure
Up to 140mm / 5.625" : 15 bar g (220 psig)

Double Type 4620P*	
Barrier Fluid Pressure**	Inboard Seal Internal Pressure Rating***
15 bar g (220 psig)	1-2 bar g (15 -30 psig) norm. 15 bar g (220 psig) max.

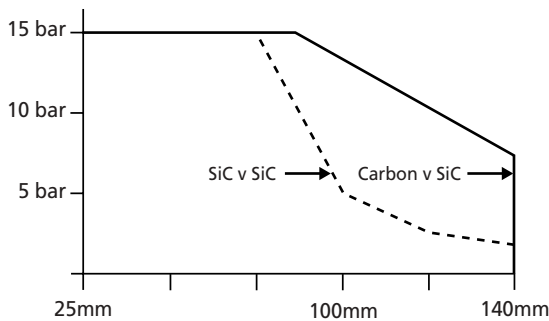
\* Barrier fluid pressure relative to seal chamber pressure (API Plan 52 or 53) determines usage of the cartridge. As a tandem, the buffer pressure is lower than process pressure; or as a double, the barrier pressure is higher than process fluid pressure to be sealed.

\*\* John Crane Engineering recommends barrier fluids having a viscosity less than 14cSt/65 SSU and fluid lubricity that is equal to or better than water at 40°C. It is recommended that the barrier temperature be maintained below 65°C.

\*\*\* Inboard seal (Process side) internal pressure rating is defined as the Barrier Fluid Pressure minus the Process Pressure.

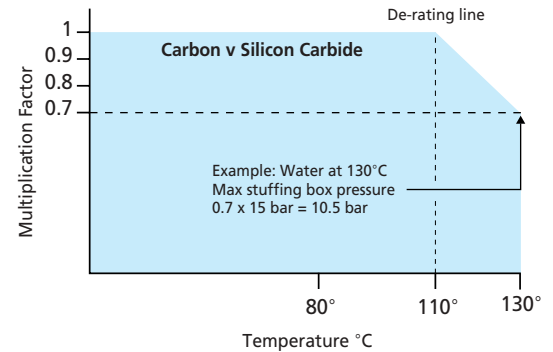
## Basic Pressure Rating

Pressure rating for 4610 and 4620 inboard seals (graph 1)



## Multiplier Factors – C on SiC

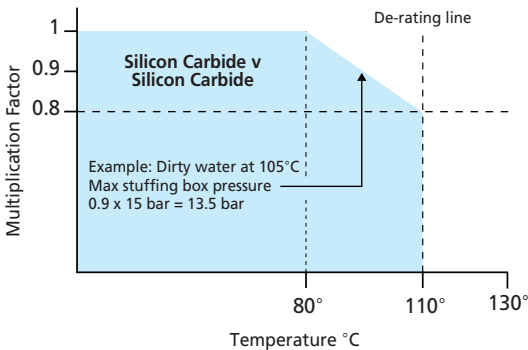
Calculating the maximum pressure for carbon v silicon when operating temperature is above 110 DegC



Multiply maximum pressure from graph 1 by de-rating factor on vertical axis to obtain maximum working pressure

## Multiplier Factors – SiC on SiC

Calculating the maximum pressure for silicon v silicon when operating temperature is above 80 DegC



Multiply maximum pressure from graph 1 by de-rating factor on vertical axis to obtain maximum working pressure

## Materials of Construction

### Component

Seat/Mating Ring  
Face/Primary Ring  
O-Ring

### Spring

Gasket, Centering Ring  
Hardware

### Standard

Silicon Carbide  
Carbon Graphite  
Fluoroelastomer

### Hastelloy C®

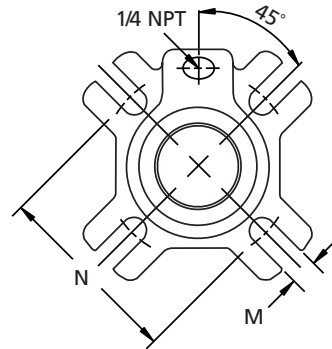
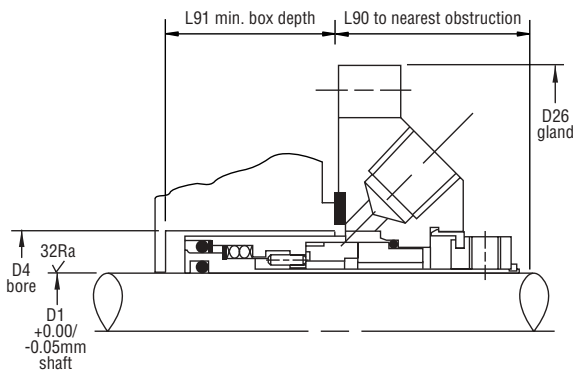
Glass-filled PTFE  
316 Stainless steel or better

### Optional

*Silicon Carbide (Inboard Only)*  
*Ethylene Propylene*  
*Perfluoroelastomer*

# Typical Arrangement/Dimensional Data

## Type 4610



See Installation Instructions for piping arrangements.

### Type 4610 Dimensional Data (inches)

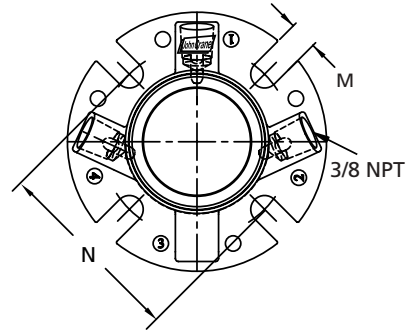
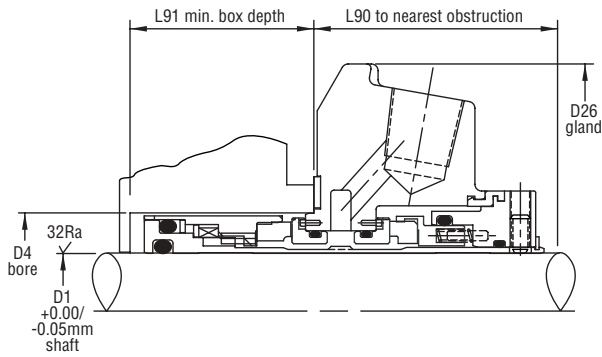
D1 Shaft Size	D4 Box Bore		D26	L90	L91	N		M
	Min.	Max.				Min.	Max.	
1.000	1.615	1.940	4.125	1.422	1.267	2.62	3.75	0.437
1.125	1.730	2.060	4.250	1.422	1.267	2.75	3.87	0.437
1.250	1.875	2.190	4.370	1.422	1.267	2.87	4.00	0.437
1.375	2.000	2.310	4.500	1.422	1.267	3.06	4.12	0.437
1.500	2.250	2.500	5.000	1.462	1.313	3.43	4.50	0.563
1.625	2.360	2.500	5.000	1.462	1.313	3.43	4.50	0.563
1.750	2.500	2.625	5.250	1.462	1.313	3.56	4.75	0.563
1.875	2.625	3.000	5.500	1.462	1.313	3.87	5.00	0.563
2.000	2.750	3.000	5.500	1.462	1.313	3.87	5.00	0.563
2.125	2.875	3.310	5.750	1.462	1.313	4.37	5.12	0.563
2.250	3.000	3.310	5.750	1.462	1.313	4.37	5.12	0.689
2.375	3.130	3.560	6.000	1.462	1.313	4.62	5.37	0.689
2.500	3.250	3.875	6.250	1.462	1.433	4.87	5.62	0.689
2.625	3.500	3.875	6.250	1.482	1.433	4.87	5.62	0.689
2.750	3.740	3.875	6.250	1.482	1.433	4.87	5.62	0.689
2.875	4.000	4.500	8.110	1.811	1.673	5.71	6.59	0.811
3.000	4.000	4.500	8.110	1.811	1.673	5.71	6.59	0.811
3.125	4.252	4.748	8.110	1.811	1.673	5.94	6.59	0.811
3.250	4.252	4.748	8.110	1.811	1.673	5.94	6.59	0.811
3.375	4.370	4.874	8.110	1.811	1.673	6.06	6.59	0.811
3.500	4.500	5.000	8.504	1.811	1.673	6.22	6.98	0.811
3.625	4.626	5.118	8.504	1.811	1.673	6.30	6.98	0.811
3.750	4.752	5.252	9.685	1.811	1.673	6.46	8.17	0.811
3.875	4.874	5.374	9.685	1.811	1.673	6.57	8.17	0.811
4.000	5.000	5.512	9.685	1.811	1.673	6.73	8.17	0.811
4.125	5.252	5.906	10.472	2.441	1.732	7.13	8.80	0.811
4.250	5.252	5.906	10.472	2.441	1.732	7.13	8.80	0.811
4.375	5.500	6.102	10.472	2.441	1.732	7.40	8.80	0.811
4.500	5.500	6.102	10.472	2.441	1.732	7.40	8.80	0.811
4.625	5.752	6.378	10.472	2.441	1.732	7.64	8.80	0.811
4.750	5.752	6.378	10.472	2.441	1.732	7.64	8.80	0.811
4.875	6.299	6.929	11.654	2.441	1.732	8.27	9.98	0.811
5.000	6.299	6.929	11.654	2.441	1.732	8.27	9.98	0.811
5.125	6.299	6.929	11.654	2.441	1.732	8.27	9.98	0.811
5.250	6.850	7.480	12.598	2.441	1.732	8.90	10.84	0.937
5.375	6.850	7.480	12.598	2.441	1.732	8.90	10.84	0.937
5.500	6.850	7.480	12.598	2.441	1.732	8.90	10.84	0.937
5.625	6.850	7.480	12.598	2.441	1.732	8.90	10.84	0.937

### Type 4610 Dimensional Data (metric)

Seal Size	D1 Shaft Size	D4 Box Bore		D26	L90	L91	N		M
		Min.	Max.				Min.	Max.	
0240	24	40.0	49.2	104.8	30	34.5	66.7	95.3	11.1
0250	25	41.0	49.2	104.8	30	34.5	66.7	95.3	11.1
0280	28	44.0	52.4	108.0	30	34.5	69.9	98.4	11.1
0300	30	46.0	55.6	111.0	30	34.5	73.0	101.6	11.1
0320	32	47.6	55.6	111.0	30	34.5	73.0	101.6	11.1
0330	33	49.0	58.7	114.3	30	34.5	73.0	101.6	11.1
0350	35	50.8	58.7	114.3	30	34.5	77.8	104.8	11.1
0380	38	57.15	63.5	127.0	31	35.5	87.3	114.3	14.3
0400	40	60.0	63.5	127.0	31	35.5	87.3	114.3	14.3
0430	43	63.0	66.7	133.4	31	35.5	90.5	120.7	14.3
0450	45	63.5	66.7	133.4	31	35.5	90.5	120.7	14.3
0480	48	66.7	76.2	139.7	31	35.5	98.4	127.0	14.3
0500	50	69.8	76.2	139.7	31	35.5	98.4	127.0	14.3
0530	53	73.0	84.1	146.0	31	35.5	111.1	130.2	17.5
0555	55	73.0	84.1	146.0	31	35.5	111.1	130.2	17.5
0580	58	79.4	90.5	152.4	31	35.5	117.5	136.5	17.5
0600	60	79.4	90.5	152.4	31	35.5	117.5	136.5	17.5
0630	63	82.6	98.4	158.8	31	35.5	123.8	142.9	17.5
0650	65	88.9	98.4	158.8	34	36.0	123.8	142.9	17.5
0700	70	95.0	98.4	158.8	34	36.0	123.8	142.9	17.5
0750	75	101.6	114.3	206	46	42.5	145	167	20.6
0800	80	108.0	120.6	206	46	42.5	151	167	20.6
0850	85	111.0	123.8	206	46	42.5	154	167	20.6
0900	90	117.5	130.0	216	46	42.5	160	177	20.6
0950	95	120.7	133.4	246	46	42.5	164	207	20.6
1000	100	127.0	140.0	246	46	42.5	171	207	20.6
1050	105	133.4	150	266	62	44	181	223	20.6
1100	110	139.7	155	266	62	44	188	223	20.6
1150	115	139.7	155	266	62	44	188	223	20.6
1200	120	146.1	162	266	62	44	194	223	20.6
1250	125	160.0	176	296	62	44	210	253	20.6
1300	130	160.0	176	296	62	44	210	253	20.6
1350	135	174.0	190	320	62	44	226	275	23.8
1400	140	174.0	190	320	62	44	226	275	23.8

Contact John Crane if enlarged bore versions are required.

## Type 4620P



See Installation Instructions for piping arrangements.

### Type 4620P Dimensional Data (inches)

D1 Shaft Size	D4 Box Bore		D26	L90	L91		N		M
	Min.	Max.			Min.	Max.	Min.	Max.	
*1.000	1.625	1.889	4.000	2.000	1.635	2.80	3.25	0.525	
1.125	1.750	2.015	4.125	2.125	1.603	2.93	3.38	0.525	
1.250	1.875	2.294	4.250	2.125	1.603	3.21	3.50	0.525	
1.375	2.000	2.421	4.375	2.125	1.603	3.34	3.63	0.525	
1.500	2.250	2.680	4.875	2.187	1.680	3.60	4.13	0.525	
1.625	2.375	2.812	5.000	2.187	1.680	3.77	4.25	0.562	
1.750	2.500	2.918	5.250	2.187	1.680	3.87	4.50	0.562	
1.875	2.625	2.918	5.250	2.187	1.680	3.87	4.50	0.562	
2.000	2.750	3.015	5.500	2.375	1.711	4.00	4.75	0.562	
2.125	2.875	3.360	5.859	2.375	1.711	4.47	4.91	0.687	
2.250	3.000	3.485	6.500	2.475	1.711	4.57	5.55	0.687	
2.375	3.125	3.610	6.500	2.528	1.711	4.72	5.55	0.687	
2.500	3.375	3.891	6.750	2.625	1.703	5.00	5.80	0.687	
2.625	3.687	4.062	6.750	2.562	1.727	5.17	5.80	0.687	
2.750	3.687	4.062	6.750	2.562	1.727	5.17	5.80	0.687	

\*Utilises external holding clips

### Type 4620P Dimensional Data (metric)

D1 Shaft Size	D4 Box Bore		D26	L90	L91		N		M
	Min.	Max.			Min.	Max.	Min.	Max.	
*24.00	41.0	48.0	101.6	50.8	41.5	71	83	13.3	
*25.00	41.0	48.0	101.6	50.8	41.5	71	83	13.3	
28.00	44.0	51.2	104.8	54.0	40.7	74	86	13.3	
30.00	46.0	58.3	108.0	54.0	40.7	82	89	13.3	
32.00	47.6	58.3	108.0	54.0	40.7	82	89	13.3	
33.00	50.8	61.5	111.1	54.0	40.7	85	92	13.3	
35.00	50.8	61.5	111.1	54.0	40.7	85	92	13.3	
38.00	57.2	68.1	123.8	55.5	42.7	91	105	13.3	
40.00	60.0	71.4	127.0	55.5	42.7	96	108	14.3	
43.00	63.5	74.1	133.4	55.5	42.7	98	114	14.3	
45.00	63.5	74.1	133.4	55.5	42.7	98	114	14.3	
48.00	66.7	74.1	133.4	55.5	42.7	98	114	14.3	
50.00	69.9	76.6	139.7	60.3	43.5	102	121	14.3	
53.00	73.0	85.3	148.8	60.3	43.5	114	125	17.5	
55.00	73.0	85.3	148.8	60.3	43.5	114	125	17.5	
58.00	79.4	91.7	165.1	64.2	43.5	120	141	17.5	
60.00	79.4	91.7	165.1	64.2	43.5	120	141	17.5	
63.00	85.7	98.8	171.5	66.7	43.3	127	147	17.5	
65.00	85.7	98.8	171.5	66.7	43.3	127	147	17.5	
70.00	93.6	103.2	171.5	65.1	43.9	131	147	17.5	

\*Utilises external holding clips

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**smiths**

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