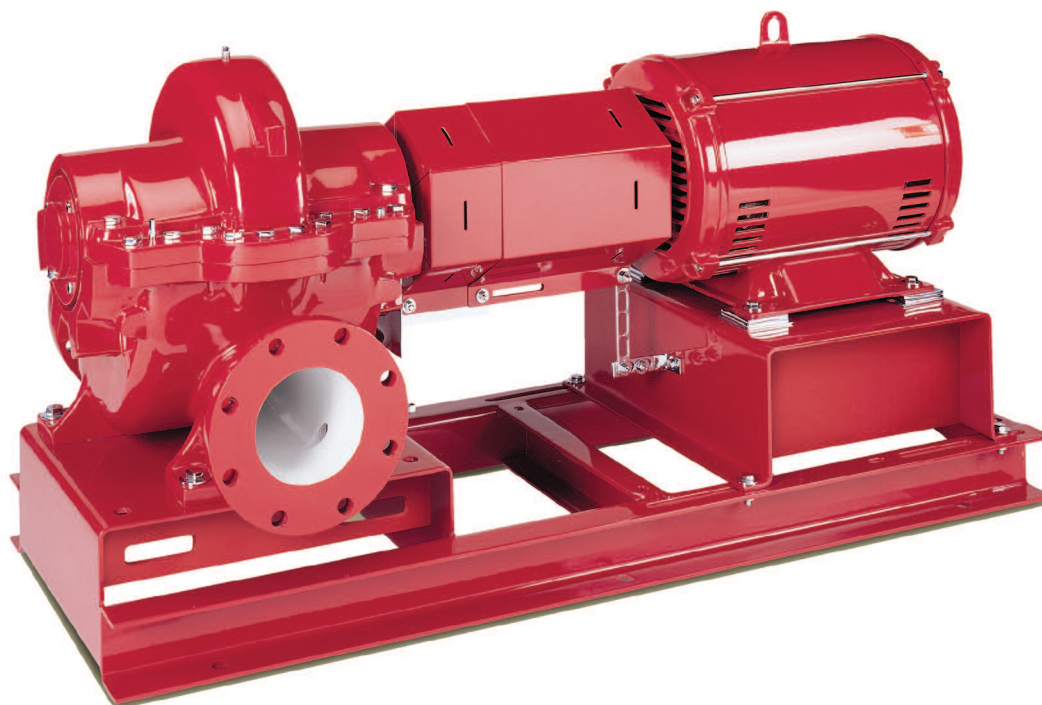




Series HSC³ Split Case Pumps

TECHNICAL BROCHURE

B-520A



Bell & Gossett
a xylem brand

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Useful Pump Formulas

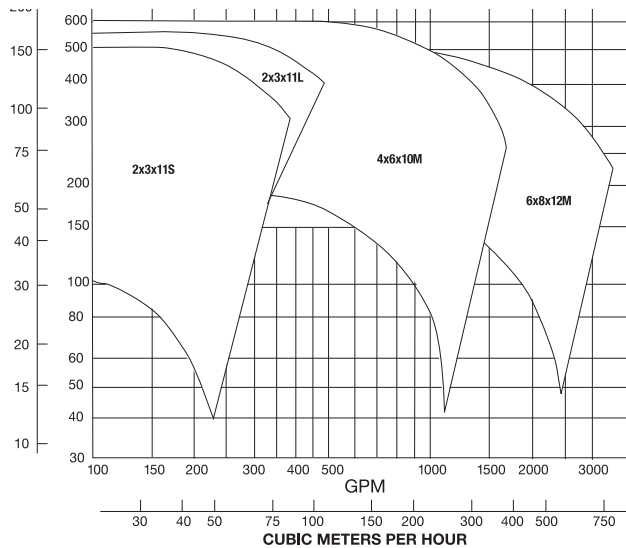
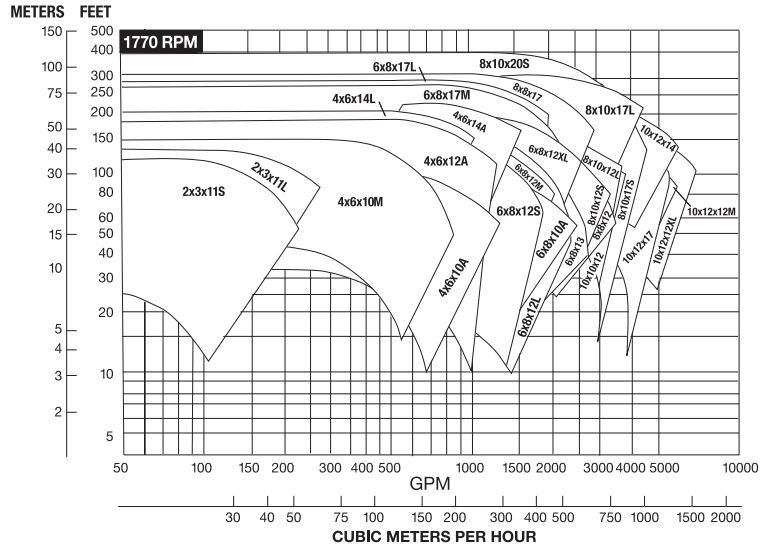
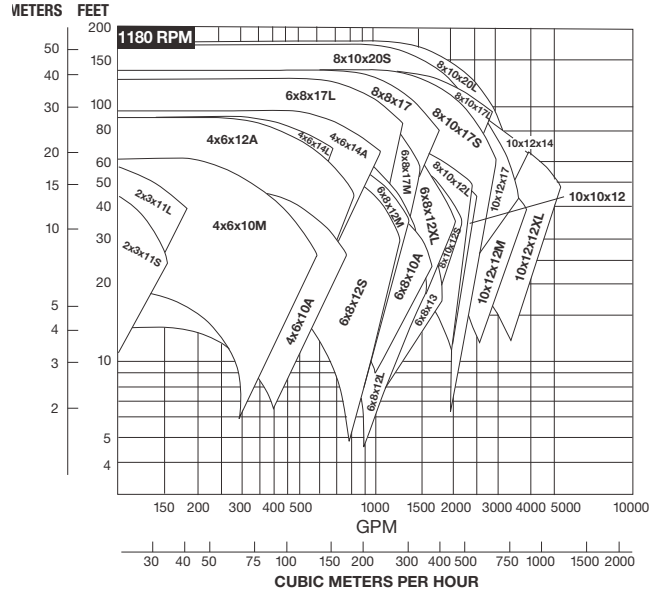
Pressure (PSI)	=	$\frac{\text{Head (Feet)} \times \text{Specific Gravity}}{2.31}$
Head (Feet)	=	$\frac{\text{Pressure (PSI)} \times 2.31}{\text{Specific Gravity}}$
Vacuum (Inches of Mercury)	=	Dynamic Suction Lift (Feet) x .883 x Specific Gravity
Horsepower (Brake)	=	$\frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}}$
Horsepower (Water)	=	$\frac{\text{GPM} \times \text{Head (Feet)} \times \text{Specific Gravity}}{3960}$
Efficiency (Pump)	=	$\frac{\text{Horsepower (Water)}}{\text{Horsepower (Brake)}} \times 100 \text{ Per Cent}$
NPSH (Available)	=	Positive Factors - Negative Factors

Affinity Laws: Effect of change of speed or impeller diameter on centrifugal pumps.

	GPM Capacity	Ft. Head	BHP
Impeller Diameter Change	$Q_2 = \frac{D_2}{D_1} Q_1$	$H_2 = \left(\frac{D_2}{D_1} \right)^2 H_1$	$P_2 = \left(\frac{D_2}{D_1} \right)^3 P_1$
Speed Change	$Q_2 = \frac{RPM_2}{RPM_1} Q_1$	$H_2 = \left(\frac{RPM_2}{RPM_1} \right)^2 H_1$	$P_2 = \left(\frac{RPM_2}{RPM_1} \right)^3 P_1$

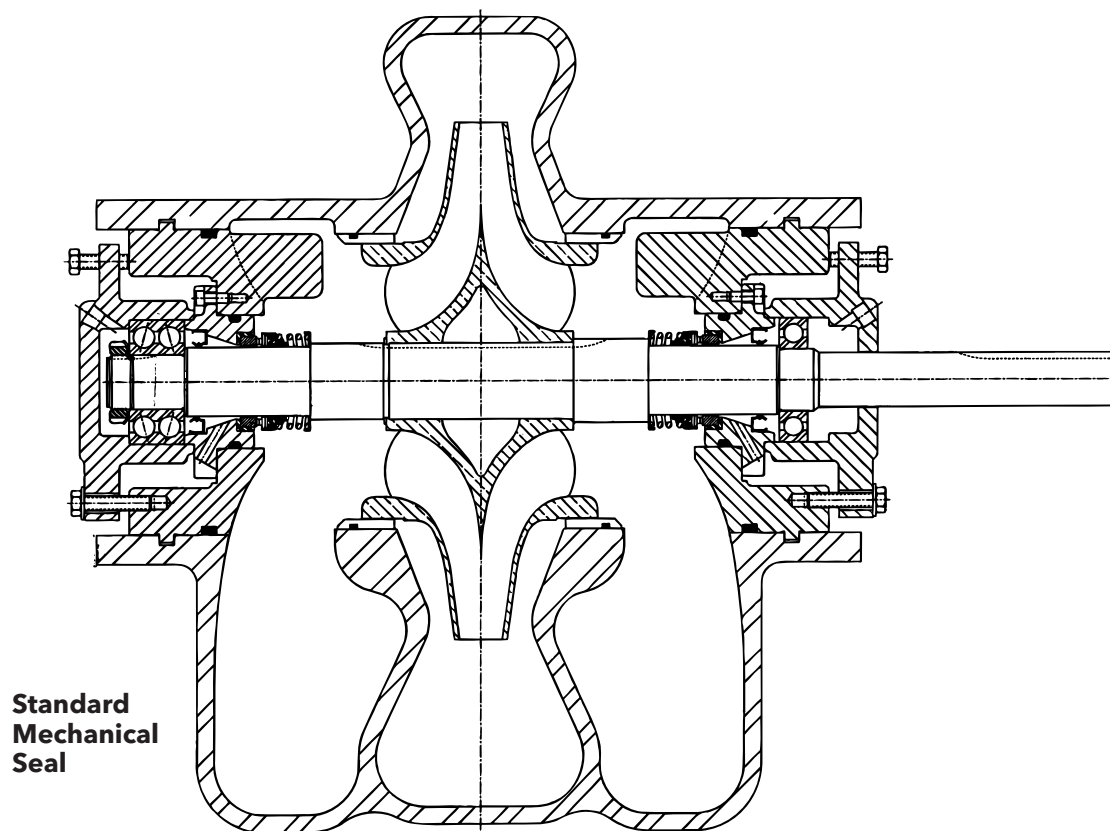
Where Q = GPM, H = Head, P = BHP, D = Impeller Dia., RPM = Pump Speed

Performance Curves - Series HSC³



Series HSC³ Materials of Construction

Mechanical Seals Mounted on Shaft



PART NAME	MATERIAL
	Cast Iron, Bronze Fitted
Casing Assembly	Cast Iron (ASTM A48 Class 35A)
Casing Joint Gasket (Suction)	Paper (Vellumoid 505)
Casing Joint Gasket (Discharge)	Paper (Vellumoid 505)
Casing Ring	Bronze (ASTM B584-932)
Shaft	416 Stn. Stl.
Bearing Housing	Cast Iron (ASTM A48 Class 30A)
Bearing Housing	Cast Iron (ASTM A48 Class 30A)
Bearing (Inboard) Ball	Steel
Bearing (Outboard) Ball	Steel
Stuffing Box (Mechanical Seal)	Cast Iron (ASTM A48 Class 30A)
Lip Seal (Bearing)	Rubber (BUNA "N")
Mechanical Seal	Stn. Stl., Rubber, Carbon, Ceramic
Capscrew (Bearing Housing)	Steel, Grade 2
Pipe Plugs (Bearing Housing)	Steel
Key, Impeller	Stn., Stl. (ANSI 416)
Key, Coupling	Steel
"O" Ring (Casing Ring)	Rubber (Buna "N")
"O" Ring (Cover Plate)	Rubber (Buna "N")
Retaining Ring (Impeller)	Steel
Ring Retaining (Bearing)	Steel
End Cap	Steel
Spirol Pin (Casing Ring)	304 SS
Impeller	Bronze (ASTM B584-875)

Mechanical Seal Data

Standard Construction:

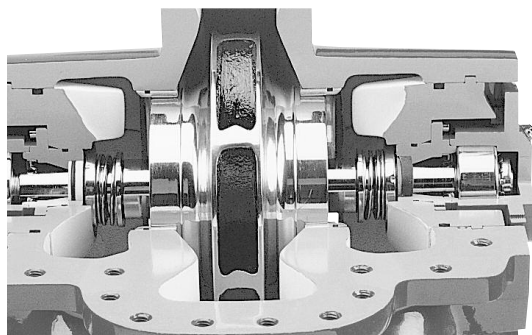
- 175 PSIG (12 BAR) Maximum Working Pressure
- *100 PSIG (7 BAR) Maximum Suction Pressure
125#FF ANSI FLANGE (ANSI A21.10, AWWA C110 & ANSI B16.1 class 125)
- Type 21, Buna/Carbon-Ceramic, *100 psig (7 bar)
maximum suction pressure, from -20 to 225°F (-29 to 107°)
- Optional Seals:
Type 21, EPR/Carbon-Ceramic, *100 psig (7 bar) maximum
suction pressure, from -20 to 250°F (-29 to 121°C)
Type 21, EPR/Carbon-Tungsten Carbide, *100 psig (7 bar)
maximum suction pressure, from -20 to 250°F (-29 to
121°C)

*Maximum suction pressure for 3500 RPM is 85 psig (6 bar).

Internally Self-Flushing Seal:

The HSC³ features internally self-flushing mechanical seals. This innovative design, an industry standard, insures maximum seal life lubrication, heat dissipation and debris removal - all without vulnerable, external flush lines and filter

kits that can clog and result in seal failure. With the Bell & Gossett internally self-flushing seal design, as much as 25% of the total pump flow continuously flushes the seal faces compared to only a few GPM for conventional stuffing box mounted mechanical seals. Seals remain cooler and unwanted debris is flushed away from the mechanical seal faces resulting in longer mechanical seal life.



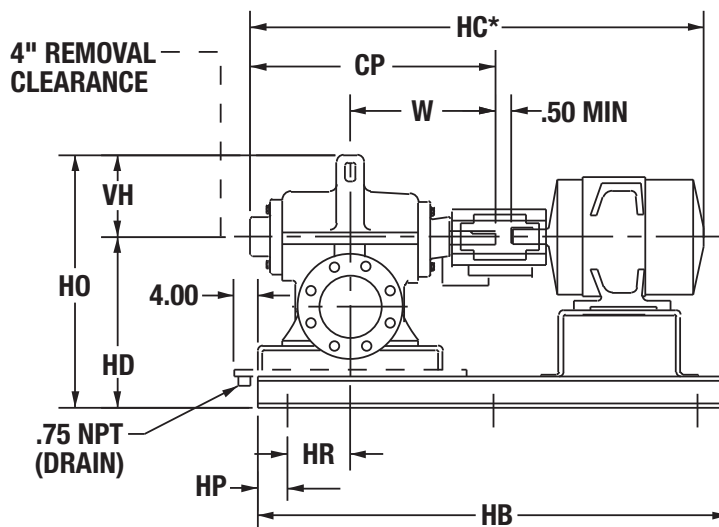
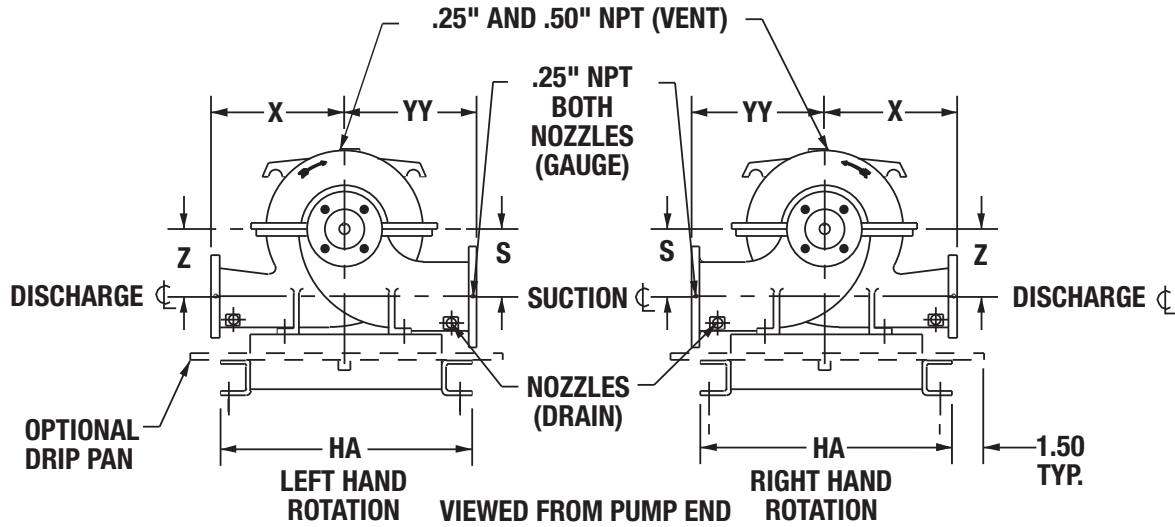
L/D Ratio Comparison

The L/D ratio measures the comparable shaft stiffness factor between two pumps where "L" equals the distance between the inboard and outboard bearings and "D" represents the shaft diameter at the impeller. The lower the ratio, the stiffer the shaft. Excessive shaft deflection will shorten mechanical

seal life, subject the shaft to fatigue stress, that could result in shaft failure and increase the bearing load with a corresponding reduction in bearing life. As calculated in the table below, the HSC³ has a L/D ratio that is significantly below a traditional horizontal split case pump.

PUMP SIZE	SERIES HSC ³			TYPICAL HORIZONTAL SPLIT CASE PUMPS		
	L= SPAN BETWEEN BEARING TO BEARING (CENTER)	D= DIAMETER THROUGH IMPELLER	L/D	L= SPAN BETWEEN BEARING TO BEARING (CENTER)	D= DIAMETER THROUGH IMPELLER	L/D
2x3x11S	11.03	1.689	6.5	20.90	1.689	12.4
2x3x11L	11.03	1.689	6.5	20.90	1.689	12.4
4x6x10A	14.56	1.939	7.5	25.25	1.939	13.0
4x6x12A	12.53	1.689	7.4	22.90	1.689	13.6
4x6x14A	12.53	1.689	7.4	22.90	1.989	13.0
6x8x10A	18.25	1.939	9.4	29.57	2.439	12.1
6x8x12S	12.53	1.689	7.4	22.90	1.689	13.6
6x8x12M	14.56	1.939	7.5	25.25	1.939	13.0
6x8x12L	12.53	1.689	7.4	22.90	1.689	13.6
6x8x12XL	12.53	1.689	7.4	22.90	1.689	13.6
6x8x13	16.16	1.939	8.3	27.25	1.939	14.1
6x8x17M	16.16	1.939	8.3	27.25	1.939	14.1
6x8x17L	16.16	1.939	8.3	27.25	1.939	14.1
8x8x12	16.16	1.939	8.3	27.25	1.939	14.1
8x8x17	18.59	2.439	7.6	29.90	2.439	12.3
8x10x12S	18.59	2.439	7.6	29.90	2.439	12.3
8x10x12L	18.59	2.439	7.6	29.90	2.439	12.3
8x10x17S	18.59	2.439	7.6	29.90	2.439	12.3
8x10x17L	18.59	2.439	7.6	29.90	2.439	12.3
8x10x20S	18.59	2.439	7.6	29.90	2.439	12.3
8x10x20L	18.59	2.439	7.6	29.90	2.439	12.3
10x10x12	21.59	2.439	8.9	32.90	2.439	13.5
10x12x12M	21.59	2.439	8.9	32.90	2.439	13.5
10x12x12XL	21.59	2.439	8.9	32.90	2.439	13.5
10x12x14	18.59	2.439	7.6	29.90	2.439	12.3
10x12x17	18.59	2.439	7.6	29.90	2.439	12.3

Series HSC³ Model - 150 Dimensions



Series HSC³ Model - 150 Dimensions

STANDARD: 125# FF ANSI FLANGE (ANSI A21.10, AWWA C110 & ANSI B16.1 class 125)

PUMP SIZE	MOTOR FRAME	DIMENSIONS - INCHES (MM)														
		HA	HB	HP	HR	CP	HC* MAX	HD	HO	S & Z	VH	VH1	W	X	YY	
2x3x11 S, L	143-215	20.00	44.00 (1118)	6.00	2.25	18.62	39 (991)	15.25 (388)	22.05 (560)	5.50	6.80	-	11.31	9.00	10.00	
	254-365	(508)	54.00 (1372)	(152)	(57)	(473)	50 (1270)			(140)	(173)		(287)	(229)	(254)	
4x6x10A	182-215	21.50	48.00 (1219)	6.00	2.88	19.93	50 (1270)	18.25 (464)	25.94 (659)	7.00	7.69	-	12.19	11.50	12.00	
	254-324	(546)	54.00 (1372)	(152)	(73)	(506)	59 (1499)			(178)	(195)		(310)	(292)	(305)	
4x6x10M	182-215	24.00 (610)	48.00 (1219)	6.00 (152)	4.62 (117)	22.81 (579)	43 (1092)	18.25 (464)	26.12 (664)	6.50 (165)	7.88 (200)	-	13.50 (343)	11.50 (292)	13.00 (330)	
	254-326		58.00 (1473)				52 (1321)									
	364-405		64.00 (1626)				61 (1549)									
	444-445		76.00 (1930)				68 (1727)									20.25 (514)
4x6x12A	215	24.00 (610)	48.00 (1219)	6.00 (152)	4.62 (117)	22.81 (579)	43 (1092)	18.25 (464)	26.81 (681)	738 (188)	8.56 (218)	-	13.50 (343)	11.50 (292)	13.00 (330)	
	254-326		58.00 (1473)				52 (1321)									
	364-365		64.00 (1626)				61 (1549)									
4x6x14A	215-256	24.00 (610)	48.00 (1219)	6.00 (152)	3.25 (83)	20.62 (524)	45 (1143)	19.52 (489)	28.50 (723)	7.75 (197)	9.20 (234)	-	12.56 (319)	11.50 (292)	13.00 (330)	
	284-365		58.00 (1473)				54 (1372)									
	404-405		68.00 (1727)				60 (1524)									
	444		76.00 (1930)				64 (1625)									21.52 (547)
4x6x14L	182-256	24.00	48.00 (1219)	6.00	3.25	20.62	45 (1143)	19.25 (489)	28.87 (733)	7.75 (197)	9.62 (244)	-	12.56 (319)	11.50 (292)	13.00 (330)	
	284-365	(610)	58.00 (1473)	(152)	(83)	(524)	54 (1372)									
6x8x10A	215-286	24.00 (610)	58.00 (1473)	6.00 (152)	10.75 (273)	29.19 (741)	56.38 (1432)	21.25 (540)	30.50 (775)	8.25 (210)	9.25 (235)	-	17.58 (447)	12.50 (328)	12.50 (318)	
	324-326		64.00 (1626)				58.38 (1438)									
	364-365		68.00 (1727)				60.38 (1534)									
6x8x12 S, L, XL	182-256	21.50 (546)	48.00 (1219)	6.00 (152)	3.25 (83)	20.62 (524)	45 (1143)	21.25 (540)	28.75 (730)	9.00 (229)	9.60 (244)	-	12.56 (319)	14.00 (356)	14.00 (356)	
	284-326		54.00 (1372)				51 (1295)									
	364-365		60.00 (1524)				54 (1372)									
6x8x12M	254-326	24.00 (610)	58.00 (1473)	6.00 (152)	4.63 (118)	22.81 (579)	53 (1346)	21.25 (540)	30.85 (784)	9.00 (229)	9.60 (244)	-	13.50 (343)	14.00 (356)	14.00 (356)	
	364-405		64.00 (1626)				61 (1549)									
	444-447		76.00 (1930)				71 (1803)	23.25 (591)	32.85 (835)							
6x8x13	254-326	24.00	62.00 (1575)	6.00	5.63	26.19	56 (1422)	20.00 (508)	29.40 (747)	8.00 (203)	9.40 (239)	-	16.06 (408)	13.00 (330)	15.50 (394)	
	364-405	(610)	68.00 (1727)	(152)	(143)	(665)	65 (1651)									
6x8x17 M, L	284-326	24.00 (610)	62.00 (1575)	6.00 (152)	5.63 (143)	26.19 (665)	56 (1442)	21.25 (540)	33.00 (838)	9.00 (229)	11.75 (299)	-	16.06 (408)	14.00 (356)	16.00 (406)	
	364-405		68.00 (1727)				65 (1651)									
	444-445		76.00 (1930)				71 (1803)									
8x8x12	254-326	24.00	62.00 (1575)	6.00	5.63	26.19	56 (1422)	20.00 (508)	30.25 (768)	8.00 (203)	10.25 (260)	-	16.06 (408)	14.00 (356)	16.50 (419)	
	364-405	(610)	68.00 (1727)	(152)	(143)	(665)	65 (1651)									
8x8x17	324-365	24.00 (610)	66.00 (1676)	6.00 (152)	7.00 (178)	28.94 (735)	62 (1575)	21.75 (553)	33.75 (857)	9.50 (241)	12.00 (305)	-	17.56 (446)	15.00 (381)	16.50 (419)	
	404-445		76.00 (1930)				74 (1880)	23.75 (603)	35.75 (908)							
	447-449		86.00 (2184)				82 (2083)									
8x10x12 S, L	254-286	24.00 (610)	62.00 (1575)	6.00 (152)	7.00 (178)	28.94 (735)	56 (1422)	21.50 (546)	32.00 (813)	8.50 (216)	10.50 (267)	-	17.56 (446)	14.00 (356)	17.00 (432)	
	324-365		66.00 (1676)				62 (1575)									
	404-445		76.00 (1930)				74 (1880)	23.50 (597)	34.00 (864)							
8x10x17 S, L	324-365	24.00 (610)	66.00 (1676)	6.00 (152)	7.00 (178)	28.94 (735)	62 (1575)	23.25 (591)	36.06 (916)	10.00 (254)	12.81 (325)	-	17.56 (446)	16.00 (406)	18.00 (457)	
	404-445		76.00 (1930)				74 (1880)	25.25 (641)	38.06 (967)							
	447-449		86.00 (2184)				82 (2083)									
8x10x20 S, L	324-365	26.00 (660)	66.00 (1676)	6.00 (152)	7.00 (178)	28.94 (735)	62 (1575)	27.25 (692)	49.50 (1257)	14.00 (356)	15.44 (392)	22.25 (565)	17.56 (446)	18.00 (457)	20.00 (508)	
	404-445		76.00 (1930)				74 (1880)	29.25 (743)	51.50 (1308)							
	447-449		86.00 (2184)				82 (2083)									
10x10x12	284-365	24.00	68.00 (1727)	6.00	8.50	31.94	68 (1727)	22.50 (572)	33.69 (856)	9.00	11.19	-	19.06	16.00	18.00	
	404-445	(610)	80.00 (2032)	(152)	(216)	(811)	81 (2057)	24.50 (622)	35.69 (907)	(229)	(284)		(484)	(406)	(457)	
10x12x12 M, XL	284-365	24.00	68.00 (1727)	6.00	8.50	31.94	68 (1727)	24.50 (622)	36.00 (914)	10.00	11.50	-	19.06	16.00	19.00	
	404-445	(610)	80.00 (2032)	(152)	(216)	(811)	81 (2057)	26.50 (673)	38.00 (965)	(254)	(292)		(484)	(406)	(483)	
10x12x14	324-365	24.00 (610)	66.00 (1676)	6.00 (152)	7.00 (178)	28.94 (735)	62 (1575)	25.25 (641)	38.69 (983)	11.00 (280)	13.44 (341)	-	17.56 (446)	18.00 (457)	20.00 (508)	
	404-445		76.00 (1930)				74 (1880)	27.25 (692)	40.69 (1034)							
	447-449		86.00 (2184)				82 (2083)									
10x12x17	324-365	24.00 (610)	66.00 (1676)	6.00 (152)	7.00 (178)	28.94 (735)	62 (1575)	25.25 (641)	38.69 (983)	11.00 (280)	13.44 (341)	-	17.56 (446)	18.00 (457)	20.00 (508)	
	404-445		76.00 (1930)				74 (1880)	27.25 (692)	40.69 (1034)							
	447-449		86.00 (2184)				82 (2083)									

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