



Pump Output

Duplex Pump Output

Litres/Stroke @ 90% Efficiency (2" Rod Diameter)

Liner Diameter (mm)

<u>Stroke Length (mm)</u>	101	108	114	121	127	133	140	146	152	159	165	170	178	184	190	197	203	209	216
203	5.40	6.19	6.99	7.78	8.73	6.69	10.6	11.5	12.7	13.8	15	16.2	17.4	18.9					
254	6.67	7.62	8.58	6.69	10.8	12.0	13.3	14.6	15.9	17.3	18.7	20.0	21.9	23.6					
305	7.78	9.90	10.10	11.40	12.9	14.3	15.9	17.3	19.1	20.7	22.6	24.3	26.2	28.3	30.4				
356					14.6	16.4	18.0	19.9	21.8	23.8	25.9	28.0	30.2	32.4	35.0	37.4	39.9		
381					15.6	17.3	19.2	21.1	23.2	25.3	27.5	29.7	32.3	34.7	37.4	39.9	42.8		
406					16.7	18.6	20.5	22.6	24.8	27.0	29.4	32.3	34.5	37.0	39.7	42.8	45.6	48.6	
457					18.4	20.7	22.7	25.3	27.8	30.2	32.7	35.6	38.5	41.3	44.5	47.7	51.1	54.4	
508					20.3	22.7	25.1	28.0	30.5	33.4	36.4	39.4	46.2	45.9	49.4	53.1	56.8	60.4	
559													49.8	53.5	57.3	61.1	65.1	69.2	73.5
610																	71.1	75.6	80.2

Note: For pump output in m³/stroke, move the decimal point 3 places to the left.

Duplex Mud Pumps

The pistons on a duplex mud pump work in both directions, so that the rear cylinder has the pump rod moving through its swept volume and occupying some volume. The difference in calculations for a duplex vs. a triplex pump is that the displacement volume of this pump rod must be subtracted from the volume in one of the cylinders, plus the difference in number of pumping cylinders; 4 for a duplex and 3 for a triplex. Duplex pumps generally have longer strokes (in the 10 to 18 in. range) and operate at lower rate; in the 40 to 80 stroke/min range.

The general equation to calculate output of a duplex pump is:

$$\text{Pump output (litres/stroke)} = \left[\frac{2 \times ID^2(mm) - OD^2(mm)}{636,500} \right] \times L(mm) \times Eff(decimal)$$

Where:

ID = ID of the liner

OD = OD of the rod

L = Length of the pump stroke

Eff = Pump efficiency (decimal)

Triplex Pump Output

Litres/Stroke @ 100% Efficiency

Liner Diameter (mm)

<u>Stroke Length (mm)</u>	102	108	114	121	127	133	140	146	152	159	165	170	178	184	190	197	203
102	2.5	2.8	3.1	3.5	3.9	4.3											
114	2.8	3.1	3.5	3.9	4.3	4.8	5.3	5.7	6.3								
127	3.0	3.5	3.9	4.4	4.8	5.3	5.8	6.4	6.9	7.5							
140	3.4	3.8	4.3	4.8	5.3	5.8	6.5	7.0	7.6	8.3							
152	3.7	4.2	4.7	5.2	5.8	6.4	7.0	7.7	8.3	9.0	9.7						
165	4.0	4.5	5.1	5.7	6.3	6.9	7.6	8.3	9.0	9.8	10.6						
178	4.3	4.9	5.5	6.1	6.8	7.4	8.2	8.9	9.7	10.6	11.4	12.3	13.2				
190	4.6	5.2	^{5.9}	6.5	7.2	8.0	8.8	9.6	10.4	11.3	12.2	13.1	14.2	15.2	16.1		
203	4.9	5.6	6.2	6.9	7.7	8.5	9.3	10.2	11.1	12.0	13.0	14.0	15.1	16.2	17.3	18.5	19.7
216	5.2	5.9	6.6	7.4	8.2	9.0	9.9	10.8	11.8	12.8	13.8	14.9	16.3	17.2	18.5	19.7	21.0
229	5.6	6.3	7.0	7.8	8.7	9.6	10.5	11.5	12.5	13.6	14.7	15.8	17.0	18.3	19.5	20.9	22.2
241	5.9	6.6	7.4	8.3	9.2	10.1	11.1	12.1	13.2	14.3	15.5	16.7	18.0	19.3	20.6	22.0	23.3
254	6.2	7.0	7.8	8.7	9.6	10.6	11.7	12.8	13.9	15.1	16.3	17.6	18.9	20.3	21.7	23.2	24.7
267	6.5	7.3	8.2	9.1	10.1	11.2	12.3	13.4	14.6	15.8	17.2	18.5	19.9	21.3	22.8	24.3	25.9
279	6.8	7.7	8.6	9.6	10.6	11.7	12.8	14.0	15.3	16.6	17.9	19.3	20.8	22.3	23.9	25.5	27.2
292	7.1	8.0	9.0	10.0	11.1	12.2	13.4	14.7	16.0	17.3	18.7	20.2	21.8	23.3	25.0	26.7	28.4
305	7.4	8.4	9.4	10.4	11.6	12.8	13.8	15.3	16.7	18.1	19.6	21.1	22.2	24.3	26.0	27.8	29.6

Note: For pump output in m³/stroke, move the decimal point 3 places to the left.

Triplex Mud Pumps

The pistons on a triplex mud pump work only on the forward stroke, and generally have short strokes (in the 6-12 inch range) and operate at rates in the 60-120 stroke/minute range.

The general equation to calculate output of a triplex pump is:

$$\text{Pump output (litres/stroke)} = \frac{ID^2(mm) \times L(mm) \times Eff (decimal)}{424,333}$$

Where:

ID = ID of the liner

L = Length of the pump stroke

Eff = Pump efficiency (decimal)