

Triplex mud pump calculator

Created by Peter Aird; Rev 1.0 Aug 2006

[Main Menu](#)

Definitions

Stroke := 1Hz

bbl := 42gal

Note: A triplex mud pump has three pump liners. For one revolution of the mud pump drive, each pump piston would therefore have pumped the equivalent of one stroke's total liner volume.

Data input [\(See Manufacturer's Site\)](#)

Liner diameter, d

Liner length, L

Pump efficiency, η %

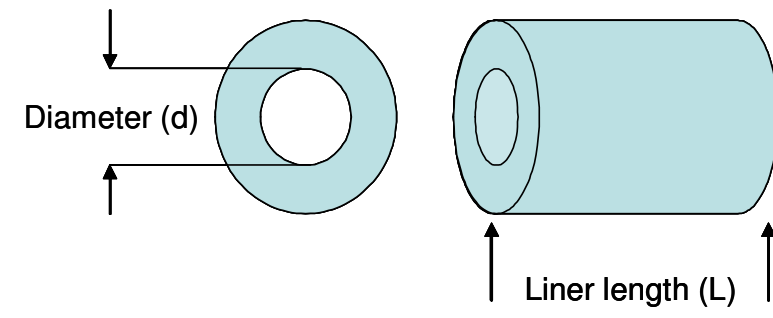
Operational Comments / Rules of thumb

Depending on rig and pump conditions safe operating speeds of 100-120rpm+ can normally be applied. e.g Best practices would be to work two pumps at optimal rates, maintaining the 3rd pump as contingency back up so that continuous operations would in most cases and circumstances result.

Step #1

Calculates the triplex mud pump output volume ($Pump_{vol}$) for the various pump liner sizes (d, inches), liner stroke length (L, inches), and volumetric efficiency (η) as input.

Mud pump liner



$$Pump_{vol} := \frac{3 \cdot \left(\frac{\pi d^2}{4} \right) \cdot L \cdot \eta}{Stroke} = \frac{3 \cdot \frac{\pi \cdot (7 \cdot in)^2}{4} \cdot 16 \cdot in \cdot 0.95}{Stroke}$$

$$Pump_{vol} = 7.597 \frac{gal}{Stroke}$$

$$Pump_{vol} = 0.1809 \frac{bbl}{Stroke}$$

Step #2

For a rig with three mud pumps when (P_{out} = gal/stroke). Step #2 calculates the total pumping volumes of the triplex mud pump(s) for a range of strokes (n) applied, with results presented in both tabular & graphical output for 2 and 3 pump outputs.

Define pump rate range (n);

n := 30, 40.. 150

$$f(n, P_n) := \text{Pump}_{\text{Vol}} \cdot \left(n \cdot \frac{\text{Stroke}}{\text{min}} \right) \cdot P_n$$

v

Volume pumped (Gals/min)		
Strokes Per Min	2 Pumps	3 Pumps
30	456	683.72
40	608	911.63
50	760	1,139.54
60	912	1,367.45
70	1,064	1,595.36
80	1,216	1,823.27
90	1,367	2,051.17
100	1,519	2,279.08
110	1,671	2,506.99
120	1,823	2,734.90
130	1,975	2,962.81
140	2,127	3,190.72
150	2,279	3,418.62

