REYNOLDS
LIFT TECHNOLOGIES
ESP PERMANENT MAGNET MOTORS

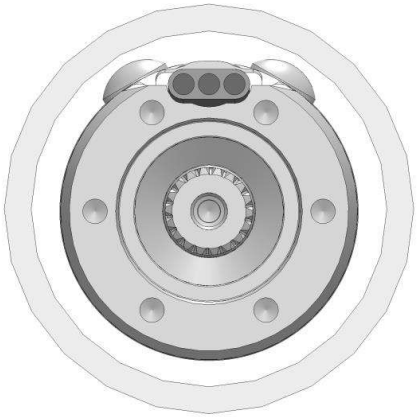
Application Study
Pressure Loss Across ESP Motor

Don't let pressure losses across your motor get in the way of your production!

Reynolds Lift's 399 Permanent Magnet Motor adds +473% more flow area compared with 456 motors

General Application
- **5-1/2" 20# Casing**
- **Initial Production, >5500 bpd**
  - **80% WC, 1.15 SG Fluid**
- **400HP ESP System**

399 PMM



5-1/2" 20# Casing
Drift Dia. = 4.653"
Casing ID = 4.778"

456 IM/PMM

	399 PMM	456 IM	Benefit
Flow Area, in^2	5.43	0.95	+473%
Length, feet	18	62	-71%
Pressure Loss, psi @5,500 bpd	8	1066	-99%

399 PMM – 400HP, 18'

456 IM – 400HP, 62'

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Setup

A computational fluid dynamics (CFD) model was created to evaluate the pressure loss across the length of ESP motors. Reynolds' 399 PMM is 18 ft. long at a rating of 400HP while the 456 IM is 62 ft. long at the same 400HP rating. The following specific parameters were used to simulate the downhole environment for a newly producing well in the Permian Basin.

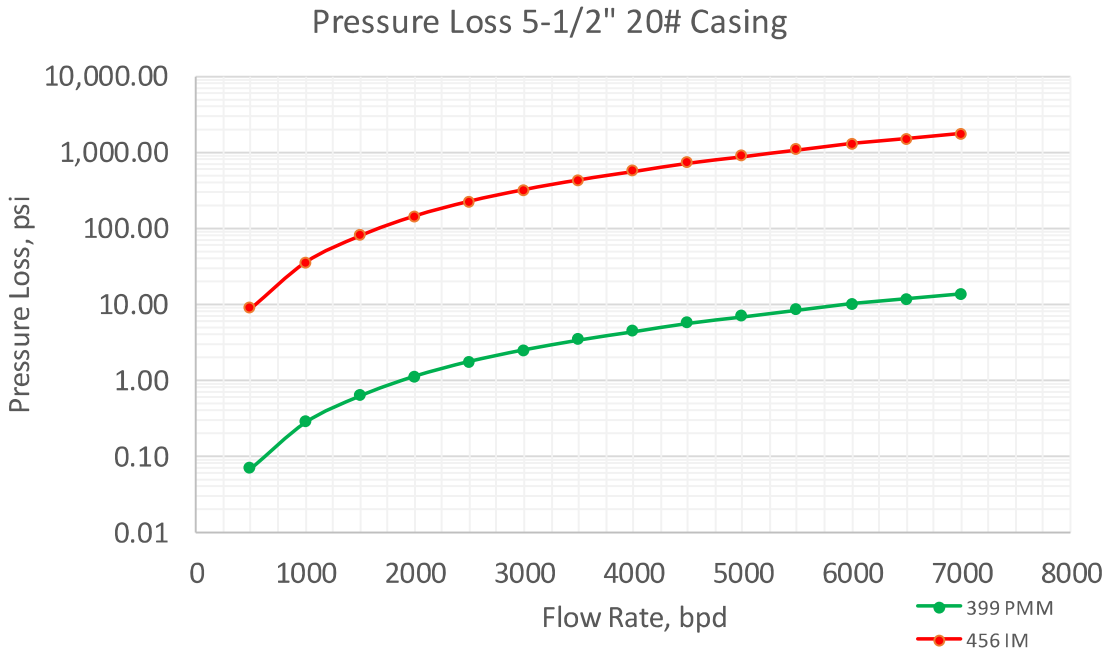
- 5-1/2" 20# Casing, 4.778" ID
- Initial Production, >5500 bpd
  - 80% WC, 1.15 SG Fluid

Results

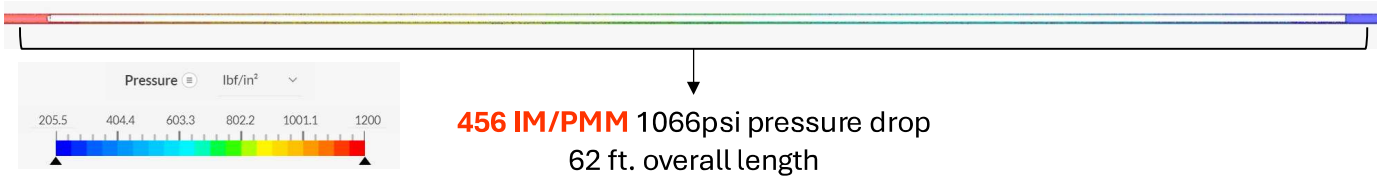
As expected, the pressure loss across the larger diameter and longer motor, 456 IM, resulted in a significant increase in pressure loss at ~1,066psi compared with the much shorter and smaller diameter 399 PMM at ~8psi. This represents a 99% decrease in pressure loss and equivalent to adding more than 2,500 ft. of depth to your intake pressure.

99%
Decrease in pressure loss

2,500 ft.
Effective increase to intake head



399 PMM ~8psi pressure drop
18 ft. overall length



456 IM/PMM 1066psi pressure drop
62 ft. overall length

