

MVP multiphase pump portfolio

Multiphase ESP pumps engineered to stabilize production in moderate-to-high gas-volume-fraction wells

Applications

- Moderate to high free gas wells, where entrained gas at the pump intake limits the ESP pump stability
- Unconventional and horizontal wells with increasing GLR and variable inflow conditions
- Primary lift applications requiring improved tolerance to entrained gas
- Charge pump applications, conditioning gassy into conventional or high efficiency producer pump
- Wells experiencing unstable operation due to free gas, where improved lift stability is required before applying mechanical gas separation

Features and Benefits

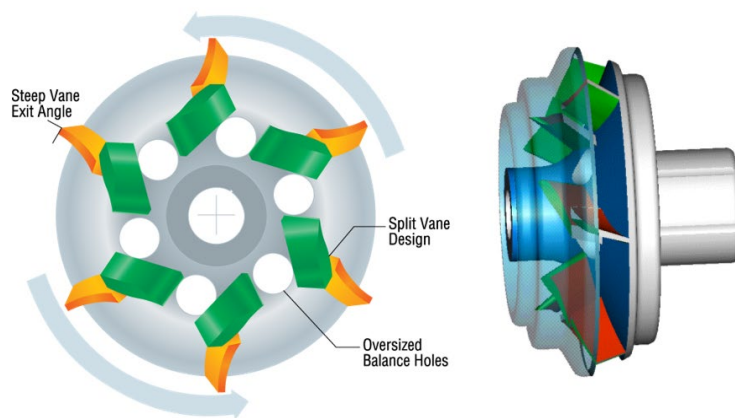
- Application flexibility across a broad range of ESP systems
- Multiphase hydraulic design engineered to handle free gas and stabilize ESP operation
- Multi vane impeller geometry reducing gas accumulation and gas lock risk
- Improved operating stability in moderate to high GVF conditions.
- Flexible system integration, suitable for use as a primary lift pump or charge/booster pump
- Reduced thrust loading through balance hole design, improving mechanical stability and reliability
- Extends ESP applicability in gassy wells, delaying or reducing the need for mechanical gas separation

The **MVP™ multiphase pump portfolio** is a series of mixed flow ESP pumps specifically engineered to **handle free gas within the pump** and stabilize ESP performance in gassy well environments. Unlike conventional mixed flow or radial ESP pumps, MVP pumps are designed to operate reliably in **moderate to high gas volume fraction (GVF) conditions**, where free gas would otherwise drive hydraulic instability, cycling, and gas lock events.

A key differentiator of the MVP portfolio is its **multi-vane hydraulic stage design**, which provides controlled internal flow paths that allow gas to migrate away from low pressure regions within the impeller. This geometry promotes **gas-liquid mixing**, reduces gas accumulation behind the vanes, and helps maintain consistent head generation compared

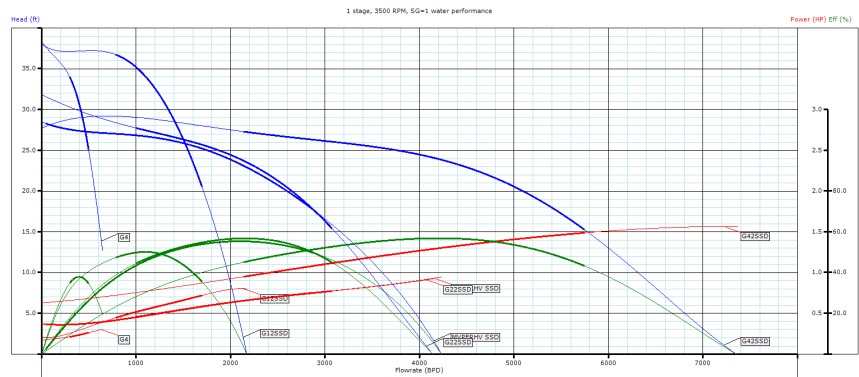
to standard ESP stage designs operating in gassy conditions. The result is improved lift stability and a wider usable operating window in wells with entrained free gas.

MVP pumps are commonly applied as **primary lift pumps or as charge/booster pumps** within a broader ESP system, depending on gas severity and system architecture. In moderate GVF wells, MVP pumps can serve as the primary lift device, while in more severe gas applications they are often positioned upstream to condition the flow before a higher efficiency producer pump. By improving tolerance to free gas and reducing gas induced instability, MVP pumps enable continued production, reduced cycling, and improved ESP reliability in wells where gas interference would otherwise limit runlife and system performance.

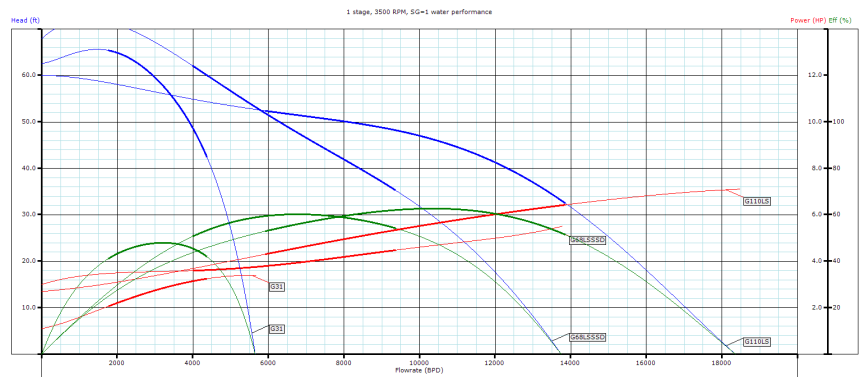


MVP stage design

Pump Series	Nominal OD: inch (cm)	Pump Name	BEP Rate: bbl/day (m ³ /day)	Recommended Flow Range: bbl/day (m ³ /day)	Efficiency at BEP
400	3.38 in (8.6 cm)	G5	500 (80)	400 – 700 (64 – 111)	43%
400	4.00 in (10.2 cm)	G12	1,200 (191)	800 – 1,700 (127 – 270)	50%
400	4.00 in (10.2 cm)	MVPER	2,200 (350)	50 – 2,900 (8 – 461)	56%
400	4.00 in (10.2 cm)	G22	2,200 (350)	1,000 – 3,100 (159 – 493)	57%
400	4.00 in (10.2 cm)	G42	4,200 (668)	2,200 – 5,800 (350 – 922)	57%
538	5.38 in (13.7 cm)	G31	3,100 (493)	1,800 – 4,400 (286 – 699)	48%
538	5.38 in (13.7 cm)	GLS68	6,800 (1,081)	4,000 – 9,500 (636 – 1,510)	60%
538	5.38 in (13.7 cm)	GLS110	11,000 (1,749)	6,000 – 14,000 (954 – 2,226)	63%
538	5.62 in (14.3 cm)	G200	20,000 (3,180)	12,000 – 24,000 (1,908 – 3,816)	55%
538	8.75 in (22.2 cm)	G470	47,000 (7,473)	37,000 – 52,000 (5,883 – 8,267)	63%



400 Series Multivane Pump (MVP) Performance Curves



500 Series Multivane Pumps (MVP) Performance Curves