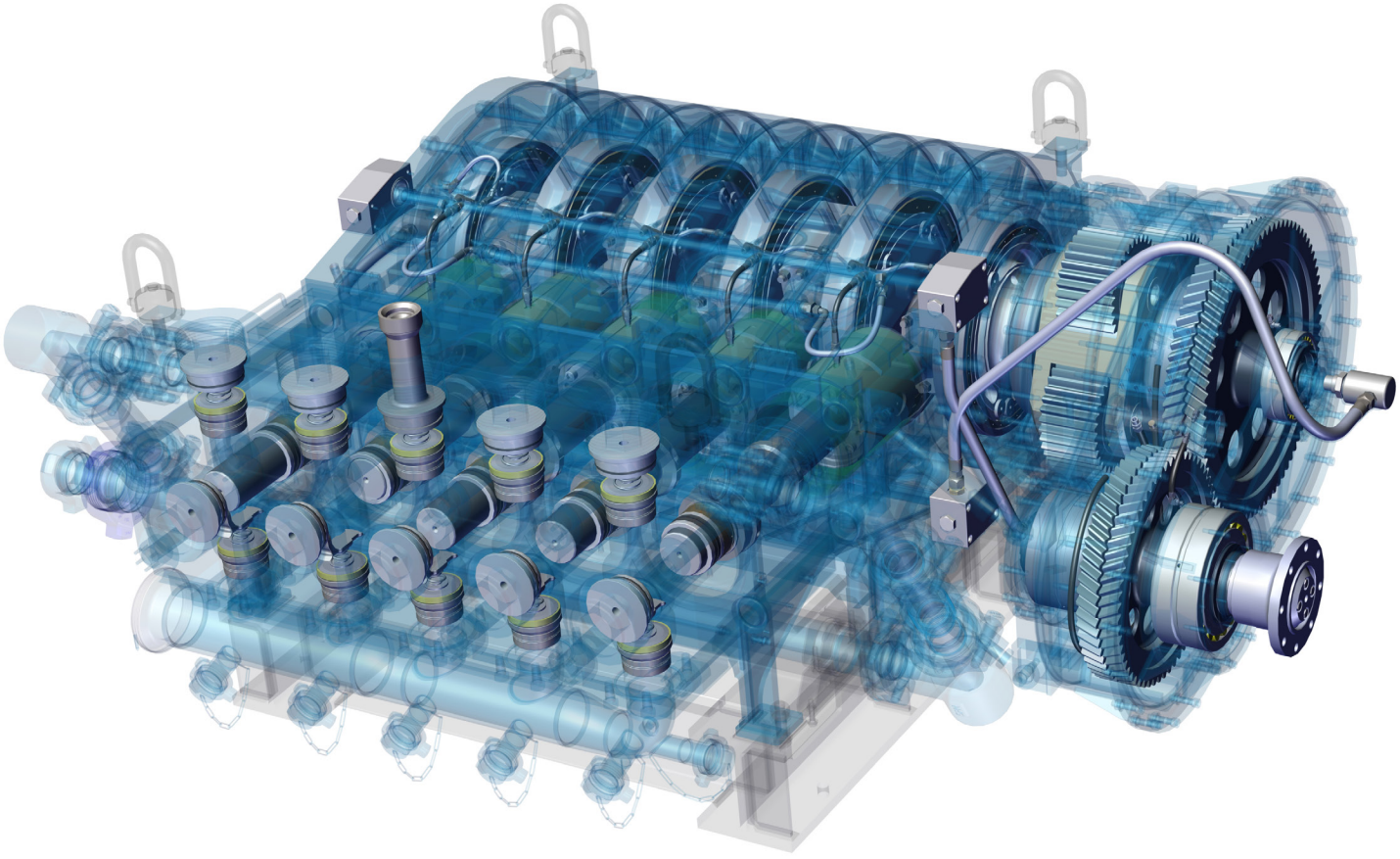
SPM® Pump Product Catalog



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Corporate Overview

Corporate Profile

The Weir Group is a well-established global engineering group, focused on delivering engineering solutions to the oil and gas, minerals, and power sectors. Founded in 1871 and headquartered in Scotland, Weir is one of the fastest-growing engineering companies in the FTSE 100, employing more than 13,000 people throughout our global operations.

Weir's Pressure Pumping team is a market leader in well service pumps and high pressure flow control equipment. SPM®'s line of reciprocating plunger pumps is used in various applications including fracturing, cementing, and acidizing. The expanding flow control product line features products used to safely transport fluids at high pressure into the wellbore during various well service applications. Weir also utilizes a global network of strategically located service facilities to provide superior post-sale services to our customers, including pump and fluid end repair, iron inspection and product rental.

Quality, Health, Safety and Environment (QHSE) Systems

Weir's Quality Management System (QMS) is qualified under ISO 9001 and 14001, as well as OHSAS 18001 requirements. Internal audits of SPM's manufacturing and service centers are performed semi-annually to verify all policies are being followed and that lean focused continuous improvement drives value for the customer. External audits are performed at a minimum of every three years by a third party certifier.

Commitment to Quality

The Weir Group is committed to managing its activities to safeguard its employees, clients, and the communities within which Weir operates in addition to the environment. Weir global EHS standards have been disseminated throughout our operations. These standards, based upon a robust risk assessment approach and recognized HSE management systems, provide a platform for continual improvement.

Commitment to Safety

Global Footprint & Services

Weir prioritizes its ability to provide a rapid response to service needs through its global network of service centers and skilled technicians. Service center teams are located in close proximity to all major shale plays and key production locations around the world to support customers with all repair and maintenance needs.

Commitment to Our Customers

Where You Need Us. When You Need Us.

Third Party Certifications

CE and DNV approval for all pump products is offered. Additional third party certifications, such as ABS or BV, may be available upon request. Contact Weir for specific information.

Extending Pump Life and Preventative Maintenance

- Most SPM® products generate, control or direct pressurized fluids; therefore, it is critical that those who work with these products be thoroughly trained in their proper application and safe handling. It is also critical that these products be used and maintained properly.
- It is a personal responsibility to use the proper tools when servicing SPM® pumps. It is a personal responsibility to be knowledgeable and trained in the use and handling of tools for all maintenance of pumps. Operating and Maintenance Instruction Manuals should be consulted before operating product.
- Each pump is clearly marked with a maximum pressure rating. This pressure must not be exceeded.
- A complete visual inspection of equipment must be made prior to each use. Any leaking seals, broken bolts, leaking hoses or improperly tightened parts must be remedied prior to using.
- Personnel must not be around pressure vessel products while pressure is present or being applied.
- Each pump, as well as each component, must have regular intervals of maintenance and inspection for safe, proper performance.
- Never tighten or hammer wing unions when the system is under pressure.
- Welding, brazing or heating on high pressure components is prohibited.

General Maintenance

- General maintenance will extend the life of pumping assets. Please refer to the operating manual for specific instructions.

Recommended Storage

- Clean and flush the power end with preservation oil and fluid end with rust preventative.
- Plug suction and discharge openings.
- Seal all open fittings and lube ports, remove power end and lube breather cap and plug the hole with a pipe plug. Tie the cap to the pump.
- Coat pinion and pony rods with rust preventative.
- Store inside in a warm, dry place.
- If pump is idle for two or more weeks, remove and lube the plungers and packing with oil before operating.

General Safety Guide

Personal Responsibilities:

- When using SPM® pumps, appropriate PPE is required, including at a minimum safety glasses, approved safety shoes and hard hat. Lifting these assemblies must be done with caution. See product manual for lifting instructions.
- Personnel should only hammer on union lugs and not strike union nut or valve body. Fractures can occur from repeated misuse. Excessive hammering can damage components.
- Proper lifting equipment rated for the load should be used at all times.
- Do not hammer on SPM® product when pressure is present.

On Location:

- Proper transportation of SPM® product is important. Never transport any SPM® product in a fashion that would allow it to become dislodged and cause an accident.
- End connections on SPM® product should be clean and lightly oiled prior to each use. A visual inspection for damage should also be performed at this time. Union seals should be checked, and replaced when worn or damaged.
- Since SPM® product may be repainted in different colors for various applications, do not use the factory as the primary means of service identification. Operator specific color schemes should be used.
- SPM® product usage should be monitored by a qualified supervisor or foreman. Supervisory personnel must approve proper placement, position, and handling of all equipment in the pumping system.
- Do not position any part of your body in the path of exit flow of SPM® flow line equipment.
- It is recommended that a rate in excess of 42 feet per second be avoided. Rates above this will cause rapid wear and erosion.
- After each job flush components with clean water and grease with the proper SPM® approved grease. Follow the instructions in the operations manuals or contact a local Weir representative for assistance.

Inspection - Repair - Testing:

- Any unauthorized alteration of SPM® pumping equipment is prohibited.
- Use only repair methods as outlined by SPM® service literature. Use only the proper SPM® repair tools.
- Only SPM® repair and service parts should be used for replacement in SPM® product.
- Weir does not allow weld repair to be attempted on any of its product. Replacing worn components is a more effective and safe approach.

Overview of SPM® Pumps

Weir manufactures a comprehensive range of high-pressure plunger pumps. SPM®'s plunger pump design incorporates the ultimate in weight and space savings while having a reputation for dependable service even in today's hybrid extended duty applications.

Weir offers the most powerful continuous duty plunger pumps on the market for today's challenging fracturing operations. Weir offers intermittent duty pump models for the full range of well service applications. These pumps may be used for oilfield and industrial applications requiring greater work periods at a reduced load.

SPM® intermittent duty plunger pumps are DNV type approved, and range from 600 BHP to 3000 BHP with pressure capabilities up to 20,000 psi. Premium plungers, valves, seats, packing, etc. can be configured to a variety of well service needs from mud based coiled tubing support services to hot oil, cementing, acidizing, fracturing,gravel packing, etc.

SPM® frac pumps are manufactured with life cycle enhancing "auto-frettage" processing of the fluid cylinder. This economical process adjusts for the harmful effects of cyclic stress and the stress corrosion cracking that occurs in high-pressure fluid cylinders. Weir's state-of-the-art auto-frettage process results in a fluid cylinder with long fatigue life expectancy at a fractional increase in cost.

Weir proudly offers classroom and shop training to better familiarize the customer with the design parameters, technical specifications, and operating characteristics of each pump model.

To further assist our customers, Weir provides an installation audit on "Alpha" units being introduced into their fleet or OEM builds. Please contact your local Weir representative for more details on this service.

Pump Reference Guide

SPM® PUMP MODEL EXPLANATION:

QWS - 2500 - SD

1st letter indicates number of cylinders:	2nd two letters indicate the intended duty cycle:	Numbers indicate max. rated BHP:	Last two letters indicate specialty designation:
T = triplex	WS = intermittent, such as well service	2500 = 2500 BHP	SD = super duty
Q = quintuplex	EM = Extended Max		LW = special lightweight design
	HB = extended, such as hydroblast		S = short
			HV = horizontal valve
			DD = direct drive
			HD - heavy duty

Selecting the Right Pump

In order to select the right pump for your application, a number of variables must be considered, including but not limited to:

Required Flow Rate

- How much fluid are you pumping?

Discharge Pressure (PSI)

- As the flow rate increases, discharge pressure of a given pump will decrease.

Rod Load (At Maximum Pressure)

- The force of pressure pushing against the piston will be transmitted back into the frame, so the entire unit is designed, tested, and rated to withstand this load.

Overview of SPM® Pumps (continued)

Engine HP (Brake HP)

- How much HP do you have available (or will you need) to deliver the required volume at the required pressure?

Operations

- Does your application require 100% capacity at all times when pumping, or will 2 smaller units provide required peak capacity allowing for pumping with 1 unit while the other is undergoing routine maintenance (improving operational efficiency overall)?

Common Pump Formulas

- Hydraulic Horse Power (HHP) = (GPM x PSI) / 1714
- Brake Horse Power (BHP) = (GPM X PSI) / (1714 x ME)
- Pressure (PSI) = (BHP x 1714 x ME) / GPM
- GPM = (BHP x 1714 x ME) / PSI
- Rod Load = PD x PD x .7854 x PSI
- GPR = (PD x PD x .7854 x SL x NC) / 231
- GPM = GPR x RPM

BHP - Brake Horsepower
GPM - Gallons Per Minute
GPR - Gallons Per Revolution
ME - Mechanical Efficiency
NC - Number of Cylinders
PD - Plunger Diameter
PSI - Pounds Per Square Inch
RPM - Revolutions Per Minute
SL - Stroke Length

Triplex or Quintuplex?

The decision to purchase a triplex (3-plunger) or quintuplex (5-plunger) pump is also influenced by a variety of factors, and either one may be the right solution. In general the following tradeoffs should be considered between the two configurations:

Triplex	Quint
Higher maximum pressure	Higher maximum flow
Lower maximum flow	Lower maximum pressure
Smaller footprint	Larger footprint
Lower weight	Higher weight
Lower HP rating	Higher HP rating
Higher peak-to-peak ΔP – pulsation control may be required	Pulsation control rarely needed
Driveline damper needed	Driveline damper seldom used

The table below lists the main features of our standard pump offerings. Additional information about each pump may be found in this catalog, or by contacting Weir Oil & Gas at 1-800-342-7458.

Pump	Recommended Application	# Cyl	Max Brake HP	Max Rod Load	Max Pressure, 4" Plunger[1]	Stroke	Gear Ratio	Displacement, 4" Plunger[2]	Dimensions	Weight
TWS 600S HD	Acidizing, cementing, gravel packing, snubbing	3	600	106,000 lbf (48,094 kg)	8,438 psi (58 MPa)	6" (152 mm)	4.61 : 1	294 gpm (1,113 lpm)	50.3" x 52.9" x 23.9" (1,276 mm x 1,344 mm x 607 mm)	4,600 lb (2,086 kg)
TWS 2250	Fracturing	3	2,250	238,570 lbf (108,213 kg)	18,985 psi (131 MPa)	8" (203 mm)	6.353 : 1	392 gpm (1,483 lpm)	89.9" x 59.8" x 44.3" (2,284 mm x 1,519 mm x 1,125 mm)	11,750 lb (5,330 kg)
TWS 2400	Fracturing	3	2,400	273,000 lbf (123,810 kg)	21,725 psi (150 MPa)	8" (203 mm)	5.588 : 1	392 gpm (1,483 lpm)	90" x 60" x 44" (2,381 mm x 1,519 mm x 1,125 mm)	11,750 lb (5,330 kg)
TWS 2500	Fracturing	3	2,500	273,000 lbf (123,810 kg)	21,725 psi (150 MPa)	10" (254 mm)	6.375 : 1	499 gpm (1890 lpm)	91" x 93" x 42" (3,311 mm x 2,362 mm x 1067 mm)	14,450 lb (6,560 kg)
TEM 2500	Fracturing	3	2,500	275,000 lbf (124,738 kg)	21,884 psi (151 MPa)	8" (203 mm)	6.963:1	392 gpm (1,487 lpm)	87" x 92" x 54" (2,210 mm x 2,337 mm x 1,372 mm)	21,000 lb (9,525 kg)

continued on next page

Overview of SPM® Pumps (continued)

Pump	Recommended Application	# Cyl	Max Brake HP	Max Rod Load	Max Pressure, 4" Plunger[1]	Stroke	Gear Ratio	Displacement, 4" Plunger[2]	Dimensions	Weight
QWS 1000S HD	Acidizing, cementing, gravel packing, snubbing	5	1,000	106,000 lbf (48,094 kg)	8,438 psi (58 MPa)	6" (152 mm)	4.61 : 1	490 gpm (1,855 lpm)	50" x 73" x 24" (1,270 mm x 1,854 mm x 609 mm)	7,040 lb (3,193 kg)
QWS 2500 SD	Fracturing	5	2,500	192,325 lbf (87,239 kg)	15,305 psi (105 MPa)	8" (203 mm)	6.353 : 1	650 gpm (2,458 lpm)	87.9" x 79.4" x 43.7" (2,233 mm x 2,017 mm x 1,110 mm)	16,000 lb (7,257 kg)
QWS 2800	Fracturing	5	2,800	273,000 lbf (123,810 kg)	21,752 psi (150 MPa)	10" (254 mm)	6.933 : 1	816 gpm* (3,087 lpm)	90.0" x 115" x 44" (2,309 mm x 2,921 mm x 1,118 mm)	20,592 lb (9,339 kg)
QEM 3000	Fracturing	5	3,000	275,000 lbf (124,738 kg)	21,880 psi (151 MPa)	8" (203 mm)	6.963:1	612 gpm (2,458 lpm)	87" x 116" x 54" (2,210 mm x 2,946 mm x 1,372 mm)	29,500 lb (13,381 kg)

1 - At 50 pump strokes per minute
2 - At 300 pump strokes per minute: note discharge pressure at this displacement rate will be significantly lower than max pressure.
3 - Pumps can exceed working pressure of the discharge iron. Care must be taken to match discharge iron maximum working pressures.
* - Max velocity is 42 FPS. With 3" iron, do not exceed.

Best Practices to Extend Pump Service Life

Operations and Maintenance

Extending pump life requires careful operation by the customer. The customer should observe and utilize the following tools and practices:

- Follow "break-in" procedure for new equipment specified in the operations manual
- Use of a Zoomie manifold to super charge the pump.
- Suction pulsation dampeners (especially recommended for Triplex pumps)
- Properly maintain plungers, packing, valves, and seats
- Improve discharge harmonics (may require high pressure dampener)
- Correct piping placement
- Proper supercharging
- Correct sand/gel concentrations and proper blender operations

Establishing the recommended preventative maintenance (PM) program is the best way to increase the life of your pump and pump components. Weir strongly recommends that each customer establish and follow a PM program for all pumping assets at all times. Details can be found in the pump operations manual, but the general PM recommendations include the following. Further details can be found in the pump operations manual provided with each new pump.

- Daily (leak checks)
- Weekly (additional system leak checks)
- Monthly or every 100 pumping hours (bolts are tight, filter changes, check consumable/wear parts inventories)
- Quarterly or every 250 hours (oil change, clean lube oil strainers and breathers, replace packing)
- Yearly (complete pump inspection, replacing worn components, all flange/manifold seals)
- Oil samples will assist in monitoring the pump.

A properly executed PM program will keep the equipment in top performance, and can prevent or identify problems before they occur. This helps to reduce and eliminate unplanned downtime and expensive lengthy repairs.

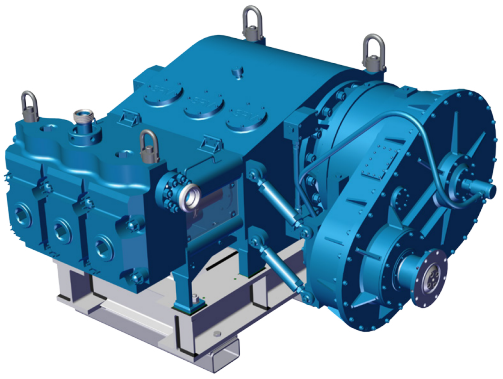
Pump Duty Cycles

Please consult your Weir representative for information on pump duty cycles.

Continuous Duty Pumps

TEM 2500 Frac Pump

The SPM® TEM 2500 is the industry's first true continuous duty high horse power stimulation pump designed to handle operation at 275,000 lbf of rod load 100% of the time. Enhanced structural rigidity through an engineered skid and segmented frame plates dramatically extends component life, while a special dual lubrication system ensures adequate delivery of clean lubricant to prevent premature failure.



APPLICATIONS: Fracturing.

Rated Max. Brake HP ..... 2,500 BHP (1,865 kW)
Maximum Rod Load ..... 275,000 lbf (124,738 kg)
Stroke Length ..... 8" (203 mm)
Gear Ratio 6.963:1
Length ..... 87" (2,210 mm)
Width ..... 92" (2,337 mm)
Height ..... 54" (1,372 mm)
Weight Dry (Approx.) ..... 21,000 lb (9,525 kg)

Note: Pump dimensions and weight are approximate. For full detailed drawings, please contact Weir.

TEM 2500 PUMP - PERFORMANCE CHART[1,2]

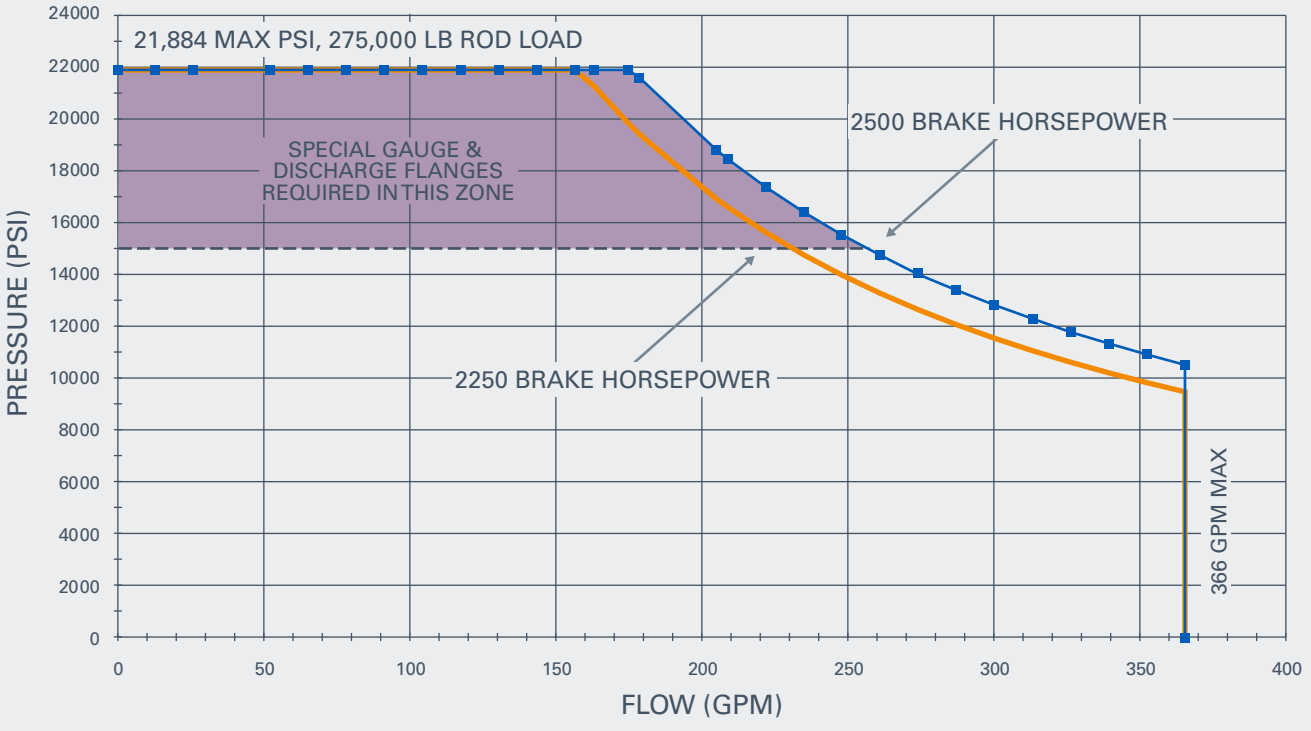
Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	348	75	522	110	766	150	1044	250	1741	280	1950
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	1.31 (4.9)	65 (247)	21884 (151)	98 (371)	21884 (151)	144 (543)	21884 (151)	196 (741)	19692 (136)	326 (1235)	11815 (81)	366 (1384)	10549 (73)
4 1/2 (114.3)	1.65 (6.3)	83 (313)	17291 (119)	124 (469)	17291 (119)	182 (688)	17291 (119)	248 (938)	15559 (107)	413 (1564)	9336 (64)	463 (1751)	8335 (57)
5 (127.)	2.04 (7.7)	102 (386)	14006 (97)	153 (579)	14006 (97)	224 (849)	14006 (97)	306 (1158)	12603 (87)	510 (1930)	7562 (52)	571 (2162)	6752 (46)
INPUT POWER: BHP (kW)		2500 (1866)		2500 (1866)		2500 (1866)		2500 (1866)		2500 (1866)		2500 (1866)	

1 Based on 90% ME and 100% VE ---- continuous duty.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermittent zones where velocity through the valves exceeds the recommended rate of 12 FPS.

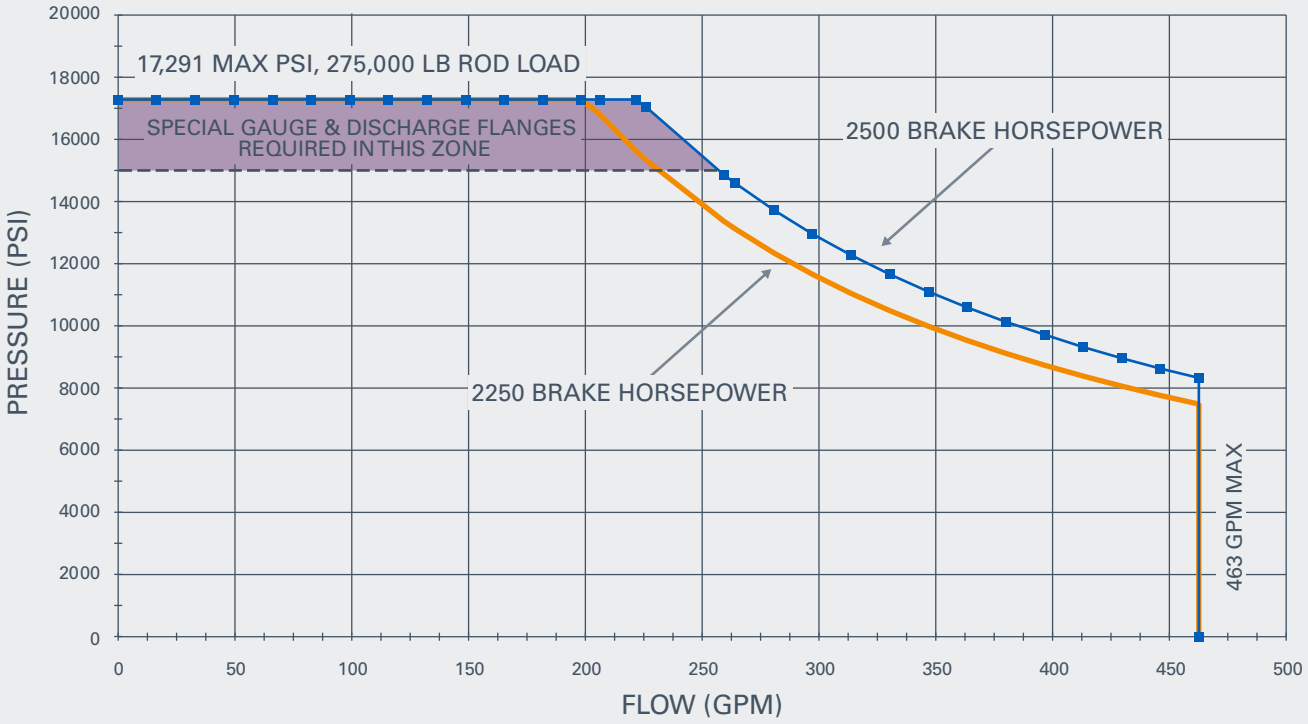
TEM 2500 Frac Pump (continued)

SPM® TEM 2500 Pump - Brake Horsepower Curve

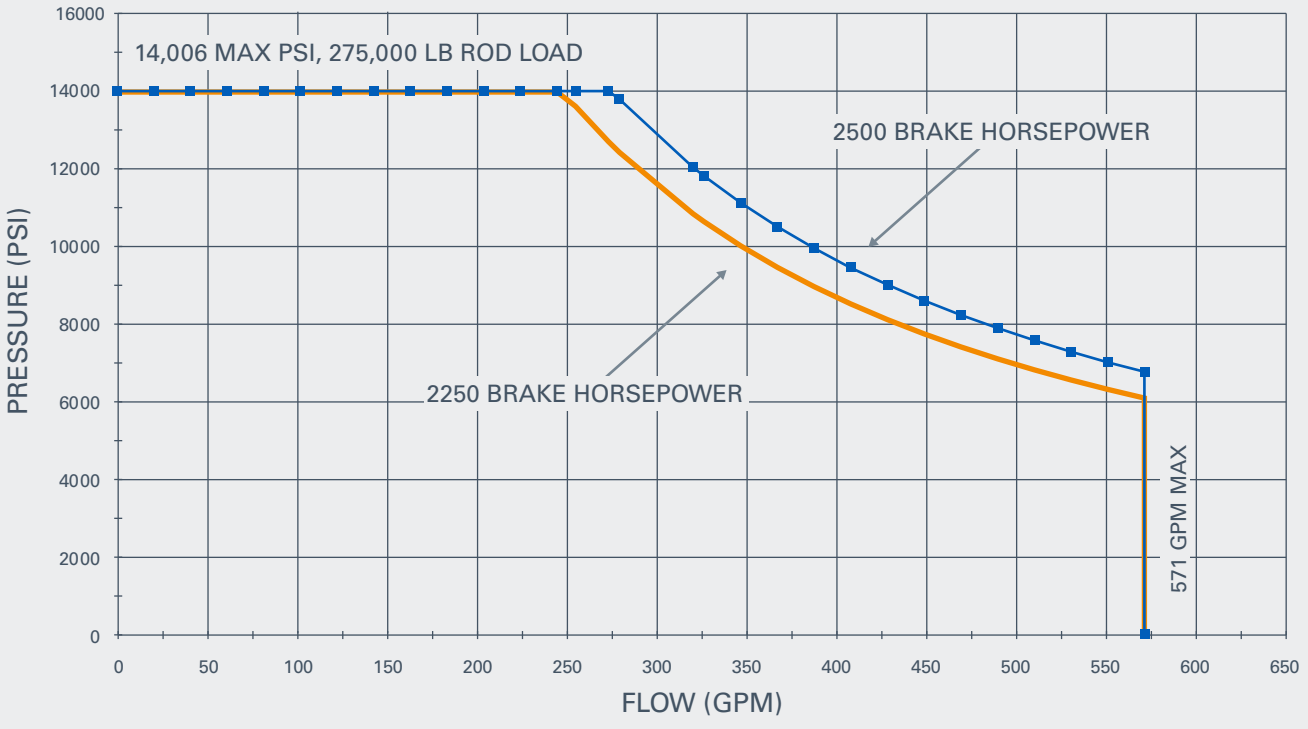
SPM® TEM 2500 Pump - 4.00" Plunger Horsepower Curve



SPM® TEM 2500 Pump - 4.50" Plunger Horsepower Curve

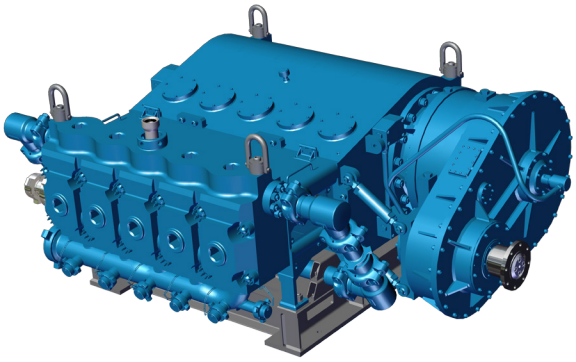


SPM® TEM 2500 Pump - 5.00" Plunger Horsepower Curve



QEM 3000 Frac Pump

The SPM® QEM 3000 is the industry's first true continuous duty high horse power stimulation pump designed to handle operation at 275,000 lb of rod load 100% of the time. Enhanced structural rigidity through an engineered skid and segmented frame plates dramatically extends component life, while a special dual lubrication system ensures adequate delivery of clean lubricant to prevent premature failure.



APPLICATIONS: Fracturing.

Rated Max. Brake HP ..... 3000 BHP (2,238 kW)
Maximum Rod Load ..... 275,000 lbf (124,738 kg)
Stroke Length ..... 8" (203 mm)
Gear Ratio 6.963:1
Length ..... 87" (2,210 mm)
Width ..... 116" (2,946 mm)
Approximate Width (Inc. Gear Reducer and Bridle) ..... 137" (3,480 mm)
Height ..... 54" (1,372 mm)
Weight Dry (Approx.) ..... 29,500 lb (13,381 kg)

Note: Pump dimensions and weights are approximate. For full detailed drawings, please contact Weir.

QEM 3000 PUMP - PERFORMANCE CHART WITH 3" FLOW IRON[1,2]

Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		97.2	677	120	863	160	1114	200	1393	240	1671	281	1958
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
3 3/4 (95.3)	1.91 (7.2)	186 (704)	24895 (172)	230 (869)	20165 (139)	306 (1158)	15124 (104)	382 (1086)	12099 (83)	459 (1737)	10082 (70)	537 (2027)	8611 (59)
4 (101.6)	2.18 (8.2)	212 (801)	21880 (152)	261 (988)	17723 (122)	348 (1318)	13292 (92)	435 (1235)	10634 (73)	522 (1977)	8861 (61)	611 (2306)	7569 (52)
4 1/2 (114.3)	2.75 (10.4)	268 (1013)	17288 (119)	330 (1251)	14003 (97)	441 (1668)	10502 (72)	551 (1564)	8402 (58)	661 (2502)	7002 (48)	774 (2931)	5980 (41)
5 (127.)	3.40 (12.9)	330 (1251)	14003 (97)	408 (1544)	11343 (78)	544 (2059)	8507 (59)	680 (1930)	6806 (47)	816 (3089)	5671 (39)	955 (3603)	4844 (33)
INPUT POWER: BHP (kW)		3000 (2239)		3000 (2239)		3000 (2239)		3000 (2239)		3000 (2239)		3000 (2239)	

1 Based on 90% ME and 100% VE ---- continuous duty.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermittent zones where velocity through the valves exceeds the recommended rate of 12 FPS.
4 Cells highlighted in orange are intermmittent zones where velocity through the Flow Line exceeds the max recommended rate of 42 FPS.

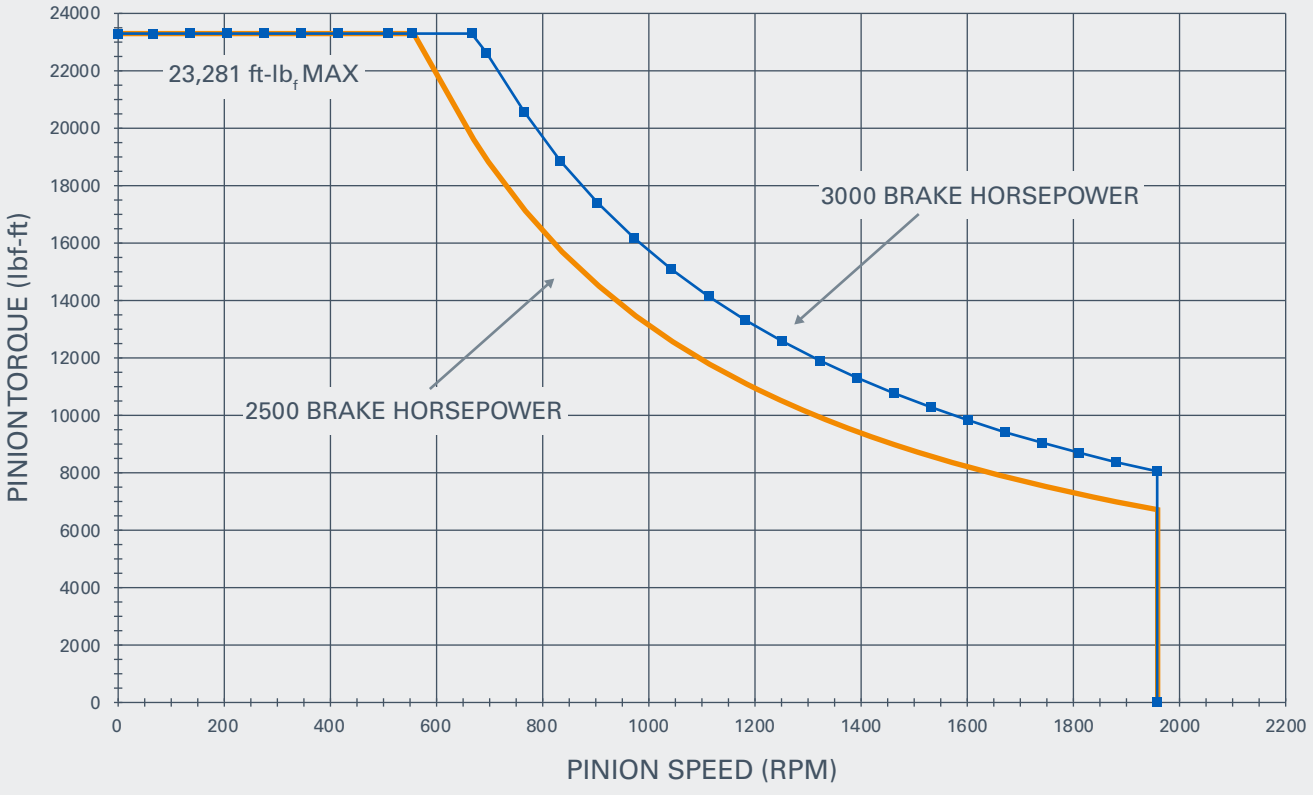
QEM 3000 Frac Pump (continued)

QEM 3000 PUMP - PERFORMANCE CHART WITH 4" FLOW IRON[1,2]

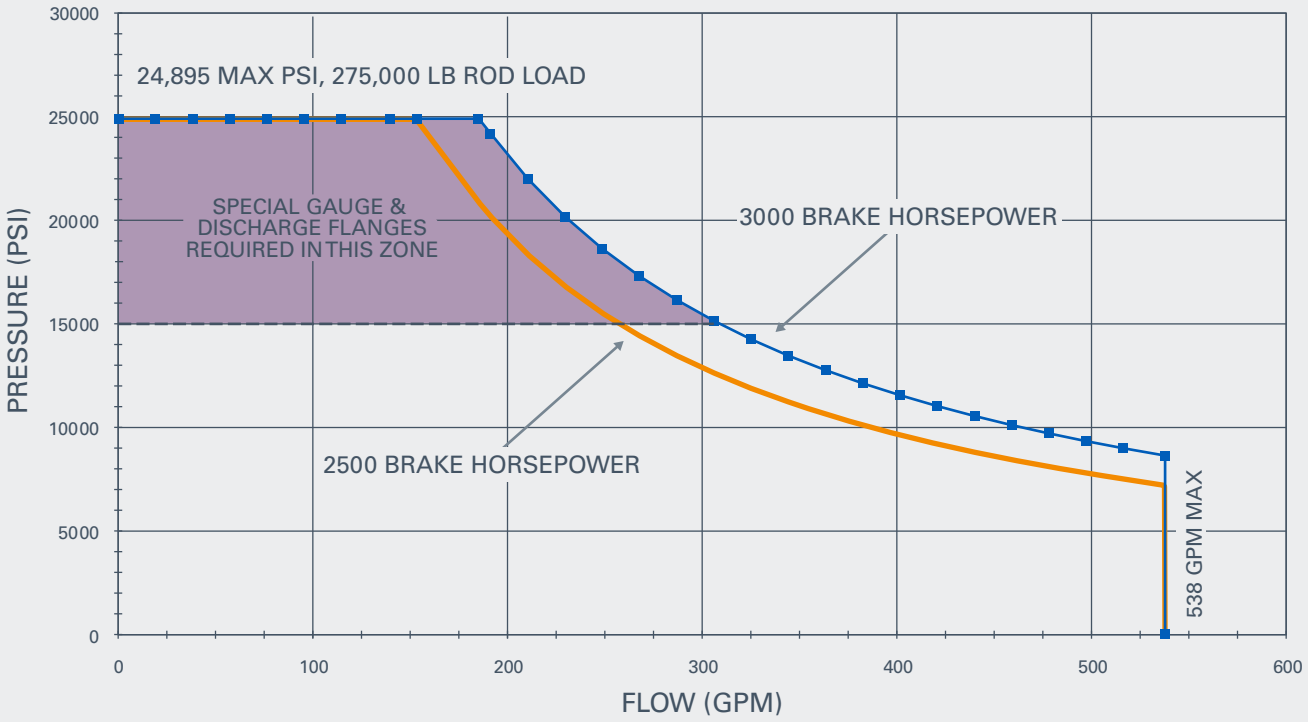
Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		97.2	677	120	863	160	1114	200	1393	240	1671	281	1958
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (Mpa)	gpm (lpm)	psi (Mpa)	gpm (lpm)	psi (Mpa)	gpm (lpm)	psi (Mpa)	gpm (lpm)	psi (Mpa)	gpm (lpm)	psi (Mpa)
3 3/4 (95.3)	1.91 (7.2)	186 (704)	24895 (172)	230 (869)	20165 (139)	306 (1158)	15124 (104)	382 (1448)	12099 (83)	459 (1737)	10082 (70)	537 (2034)	8611 (59)
4 (101.6)	2.18 (8.2)	212 (801)	21880 (151)	261 (988)	17723 (122)	348 (1318)	13292 (92)	435 (1647)	10634 (73)	522 (1977)	8861 (61)	612 (2316)	7568 (52)
4 1/2 (114.3)	2.75 (10.4)	268 (1013)	17288 (119)	330 (1251)	14003 (97)	441 (1668)	10502 (72)	551 (2085)	8402 (58)	661 (2502)	7002 (48)	774 (2931)	5980 (41)
5 (127.)	3.40 (12.9)	330 (1251)	14003 (97)	408 (1544)	11343 (78)	544 (2059)	8507 (59)	680 (2574)	6806 (47)	816 (3089)	5671 (39)	955 (3617)	4840 (33)
INPUT POWER: BHP (kW)		3000 (2238)		3000 (2238)		3000 (2238)		3000 (2238)		3000 (2238)		3000 (2238)	

1 Based on 90% ME and 100% VE ---- continuous duty.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact SPM Engineering for information.
3 Cells highlighted in blue are intermittent zones where velocity through the valves exceeds the recommended rate of 12 FPS

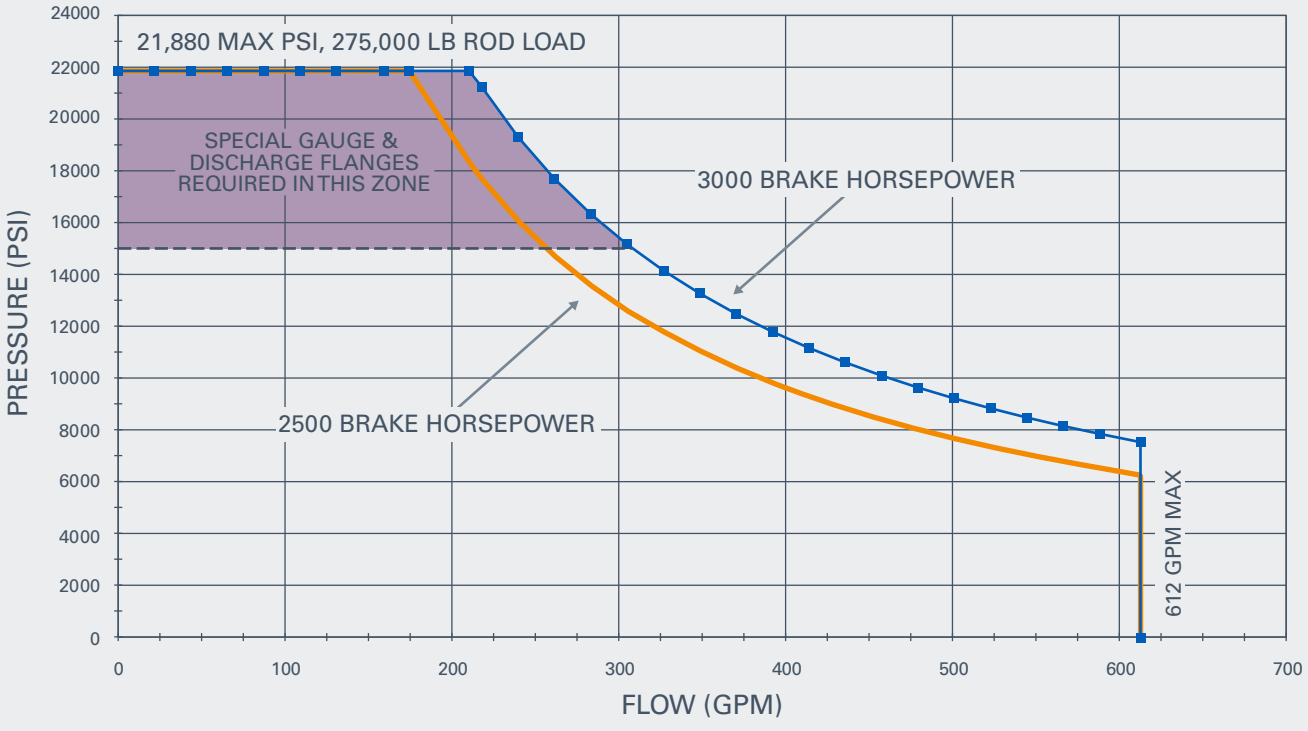
SPM® QEM 3000 Pump - Brake Horsepower Curve



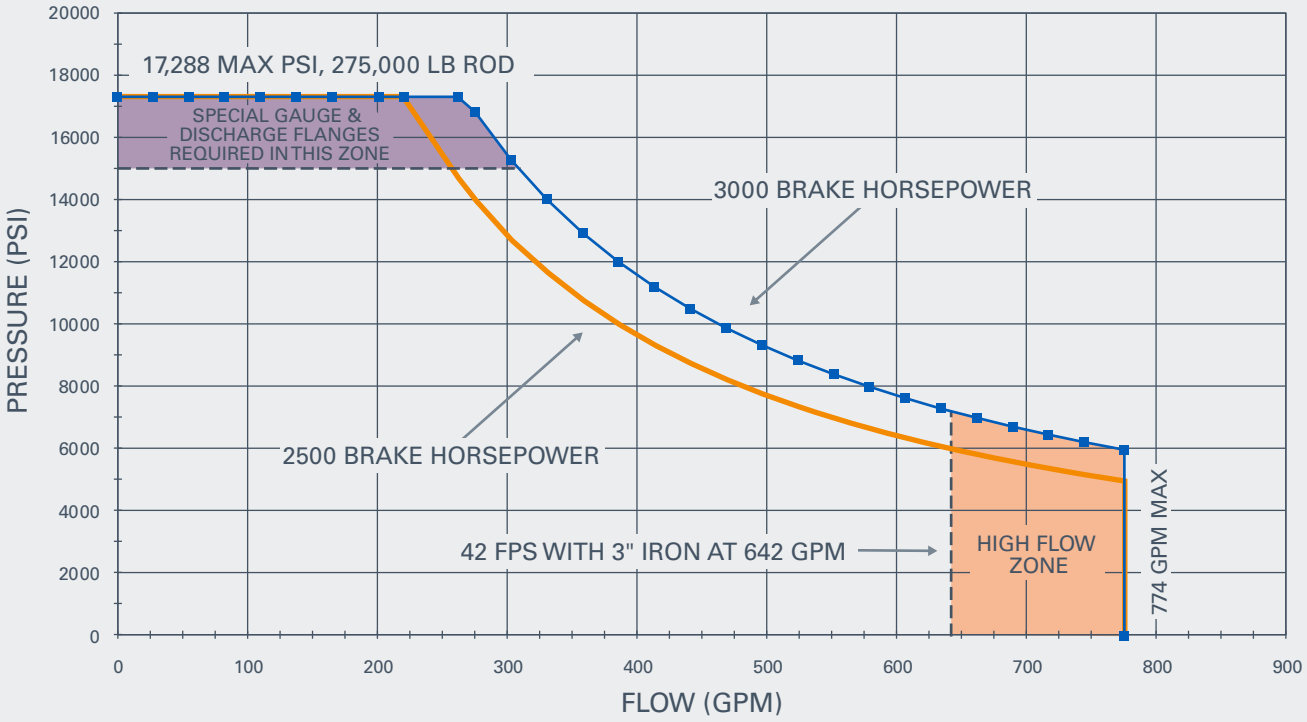
SPM® QEM 3000 Pump - 3.75" Plunger Horsepower Curve



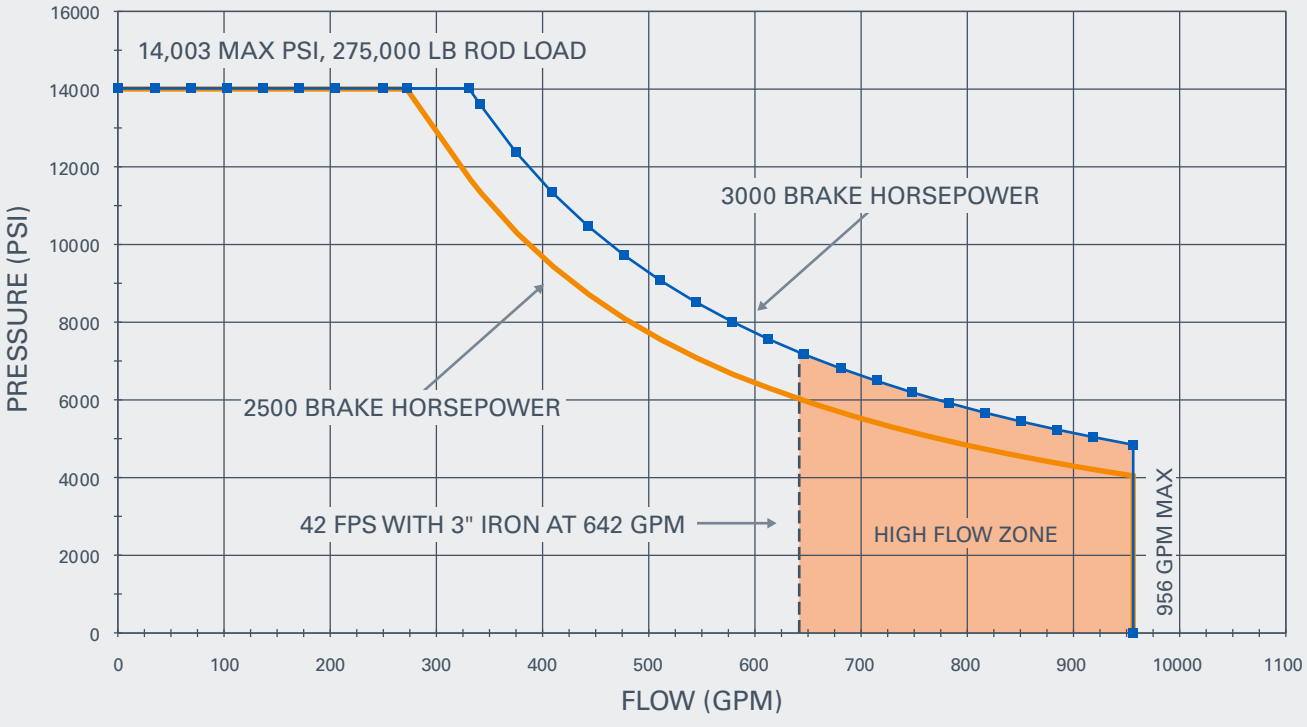
SPM® QEM 3000 Pump - 4.00" Plunger Horsepower Curve



SPM® QEM 3000 Pump - 4.50" Plunger Horsepower Curve

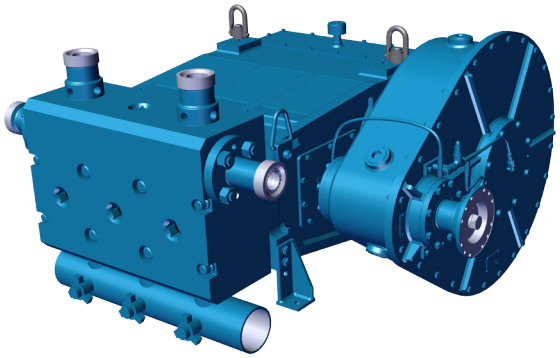


SPM® QEM 3000 Pump - 5.00" Plunger Horsepower Curve



Intermittent Duty Pumps

TWS 600S HD Well Service Pump



The SPM® TWS 600S HD pump is specifically engineered to reduce downtime due to maintenance while improving rod load and high pressure capabilities. The Heavy Duty design is built with quick and practical maintenance in mind, while supplying 6% higher rod load at pressures of 15,000 psi utilizing a 3" plunger and 20,000 psi utilizing a 2.5" plunger. The TWS 600S HD pump is designed to eliminate contamination from pumping media into the power end, extending pump component life. Retrofit kits are available for customers currently operating TWS 600S pumps, helping them make the transition to the TWS 600S HD pump. Customers are able to update their units to the latest technology without the capital investment of a complete new unit.

APPLICATIONS: Cementing, acidizing, gravel packing, snubbing.

Rated Max. Brake HP ..... 600 BHP (447 kW)
Maximum Rod Load ..... 106,000 lbf (48,094 kg)
Number of Cylinders 3
Stroke Length ..... 6" (152.4 mm)
Gear Ratio 4.61:1
Length ..... 50" (1,270 mm)
Width ..... 53" (1,346 mm)
Height ..... 24" (610 mm)
Weight Dry (Approx.) ..... 4,600 lb (2,086 kg)

Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

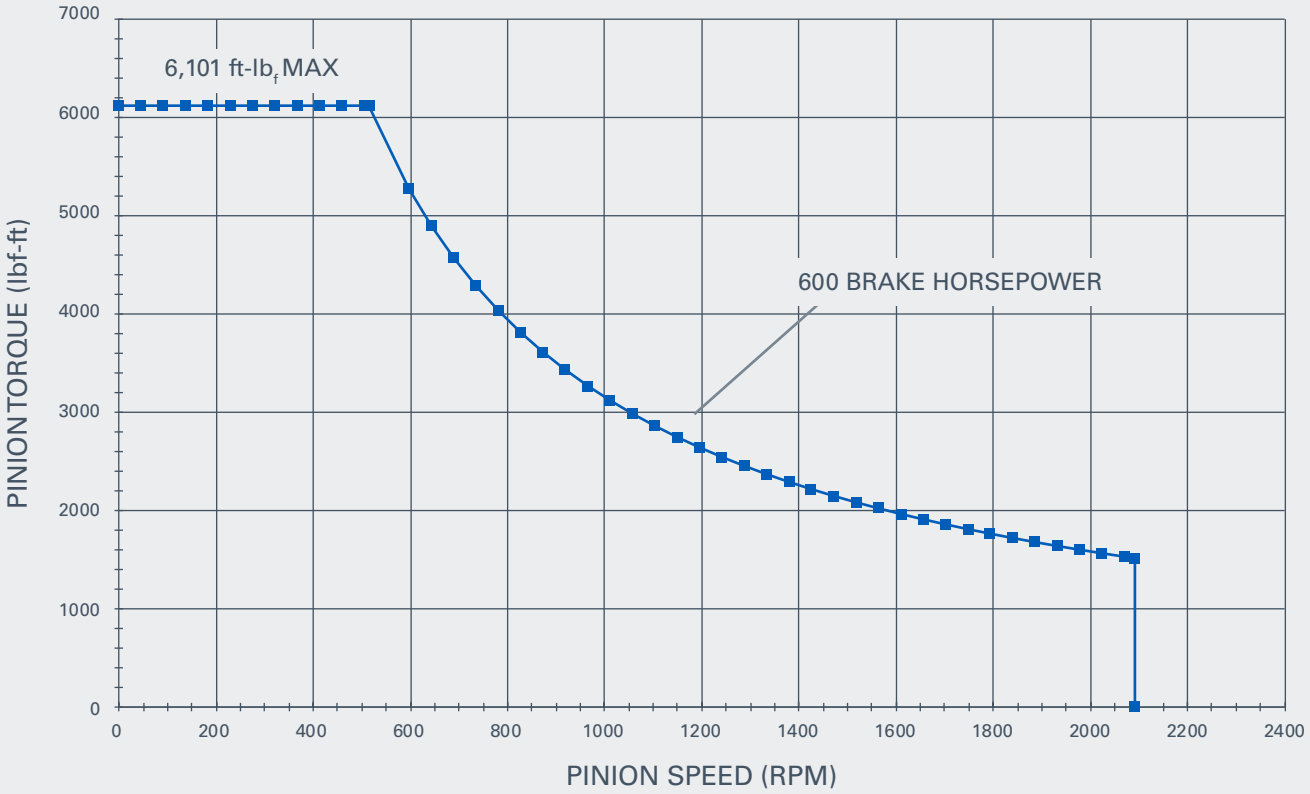
TWS 600S HD PUMP PERFORMANCE CHART[1,2]

Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	231	100	461	112	516	200	922	350	1614	455	2096
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
2 1/2 (63.5)	0.38 (1.4)	19 (72)	21600 (149)	38 (145)	21600 (149)	43 (162)	21599 (149)	76 (290)	12099 (84)	134 (507)	6914 (48)	174 (658)	5322 (37)
2 3/4 (69.9)	0.46 (1.8)	23 (88)	17851 (123)	46 (175)	17851 (123)	52 (196)	17851 (123)	93 (350)	9999 (69)	162 (613)	5714 (40)	210 (797)	4398 (30)
3 (76.2)	0.55 (2.1)	28 (104)	15000 (104)	55 (208)	15000 (104)	62 (234)	15000 (104)	110 (417)	8402 (58)	193 (730)	4801 (33)	250 (948)	3696 (26)
3 1/2 (88.9)	0.75 (2.8)	37 (142)	11020 (76)	75 (284)	11020 (76)	84 (318)	11020 (76)	150 (568)	6173 (43)	262 (993)	3527 (24)	341 (1290)	2715 (19)
4 (101.6)	0.98 (3.7)	49 (185)	8438 (58)	98 (371)	8438 (58)	110 (415)	8437 (58)	196 (741)	4726 (33)	343 (1297)	2701 (19)	445 (1685)	2079 (14)
4 1/2 (114.3)	1.24 (4.7)	62 (235)	6667 (46)	124 (469)	6667 (46)	139 (526)	6666 (46)	248 (938)	3734 (263)	434 (1642)	2134 (15)	564 (2133)	1642 (11)
INPUT POWER: BHP (kW)		268 (200)		536 (400)		600 (448)		600 (448)		600 (448)		600 (448)	

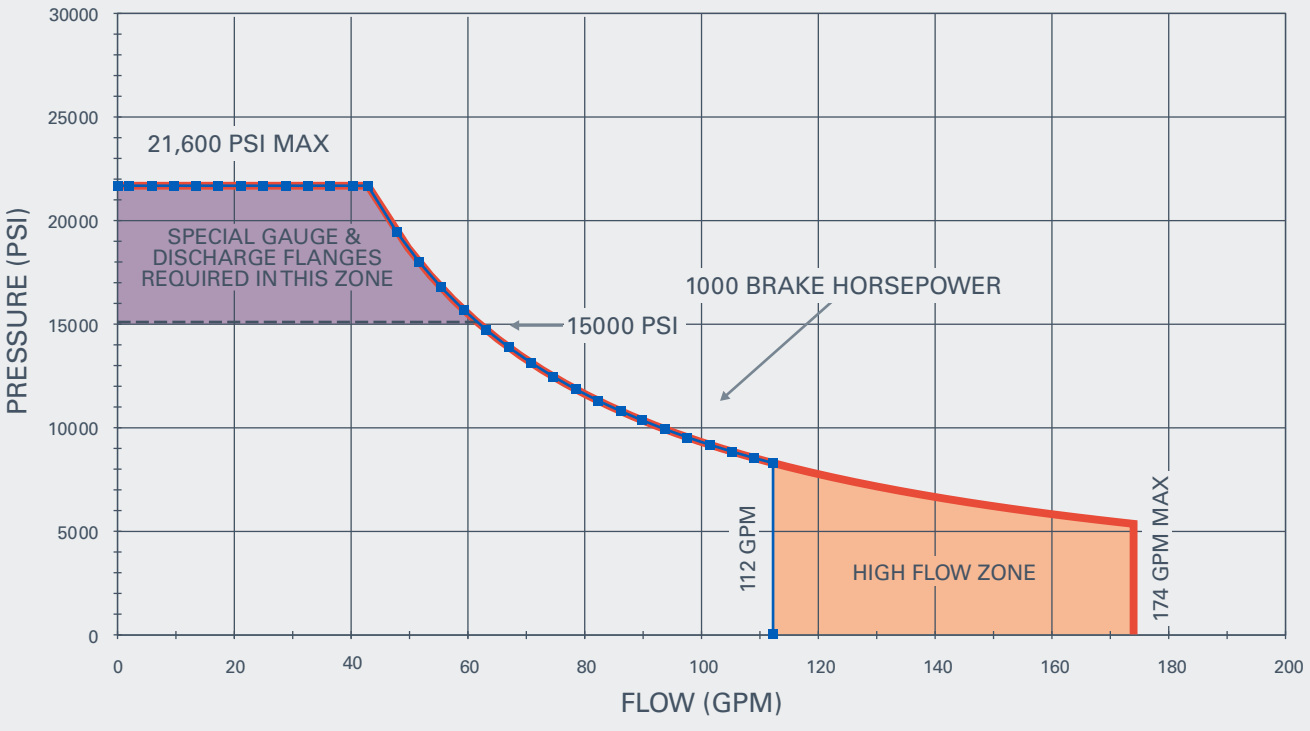
1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM).

TWS 600S HD Well Service Pump (continued)

SPM® TWS 600S HD Pump - Brake Horsepower Curve

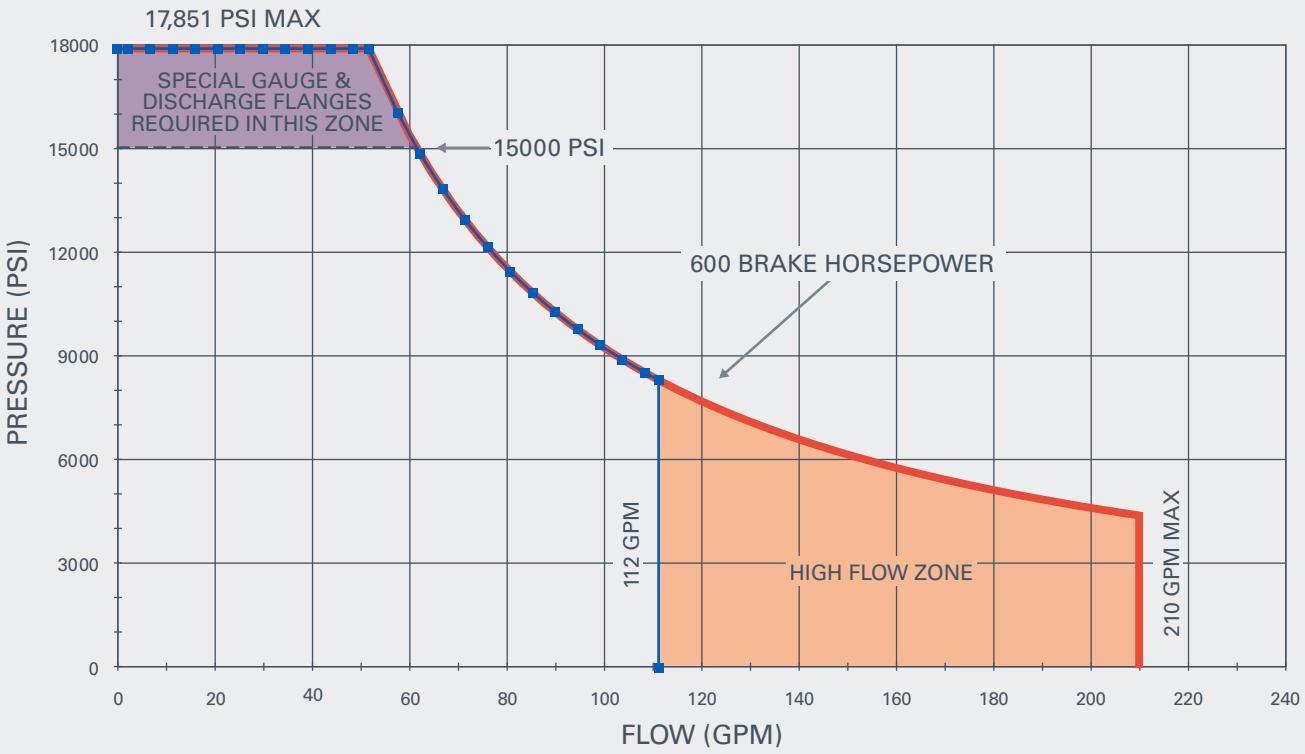


SPM® TWS 600S HD Pump - 2.50" Plunger Horsepower Curve

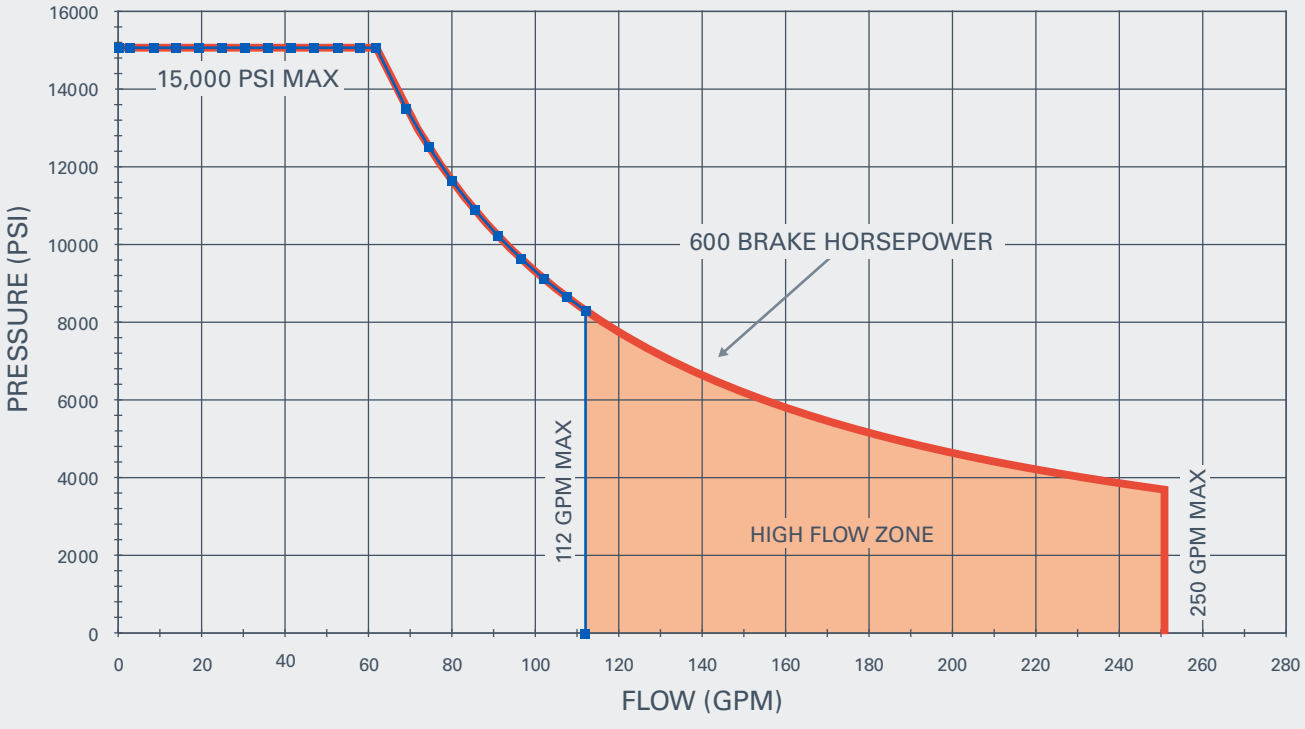


TWS 600S HD Well Service Pump (continued)

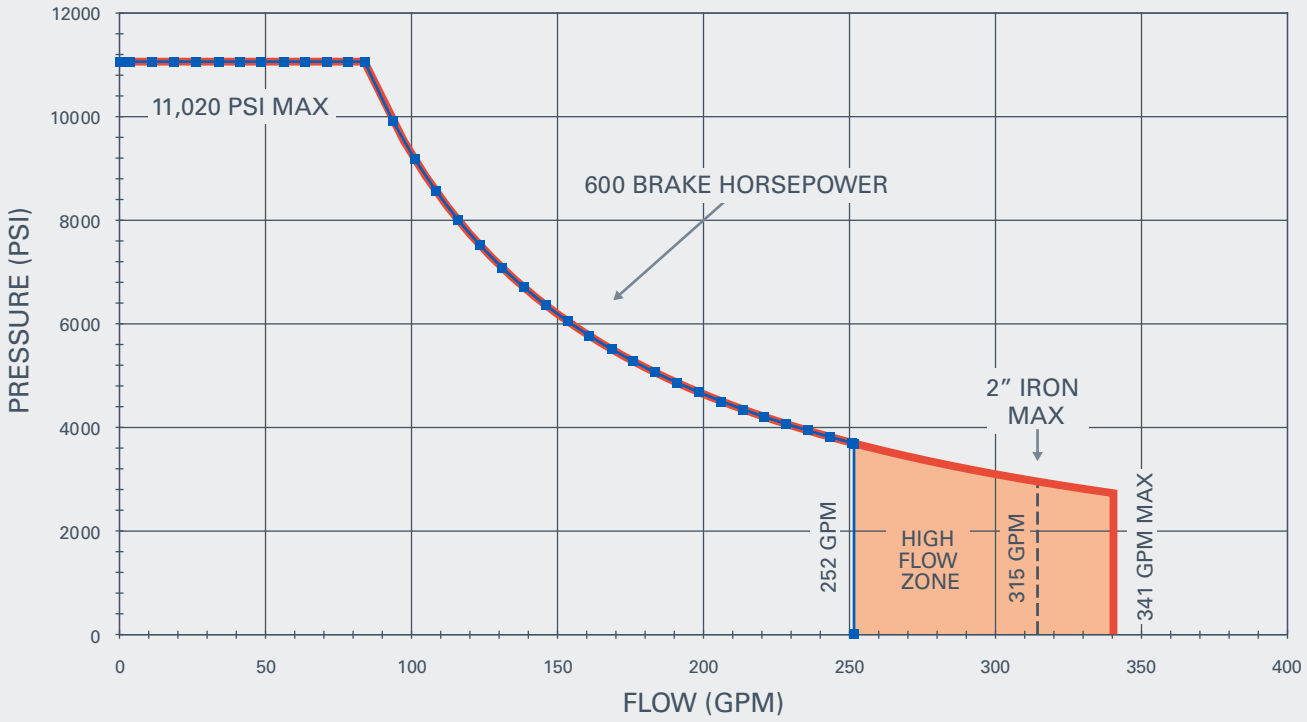
SPM® TWS 600S HD Pump - 2.75" Plunger Horsepower Curve



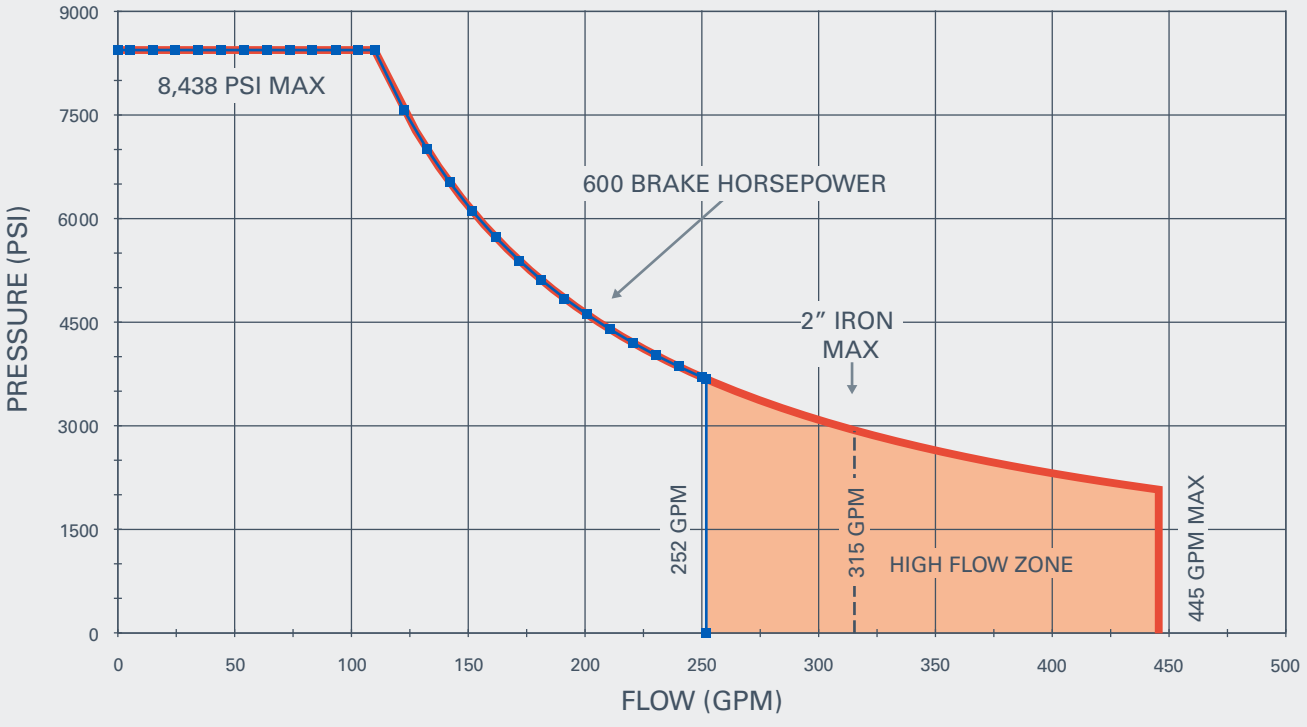
SPM® TWS 600S HD Pump - 3.00" Plunger Horsepower Curve



SPM® TWS 600S HD Pump - 3.50" Plunger Horsepower Curve

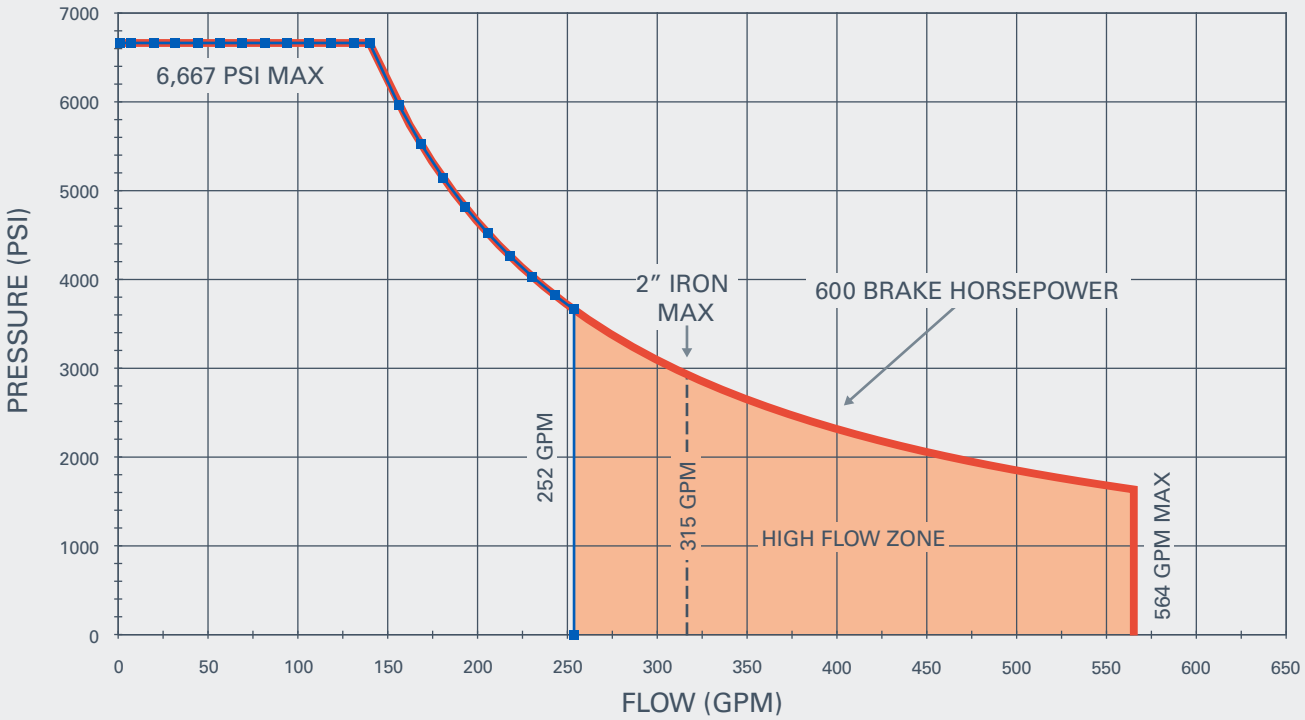


SPM® TWS 600S HD Pump - 4.00" Plunger Horsepower Curve



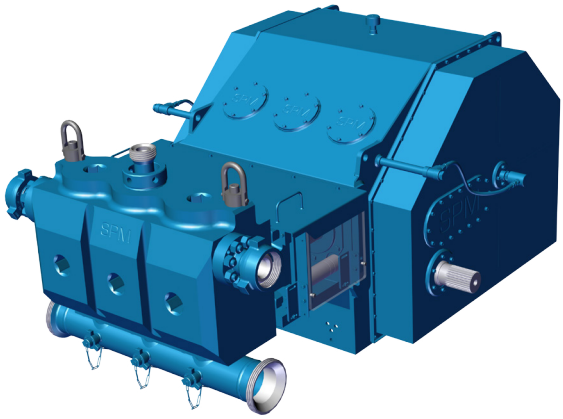
TWS 600S HD Well Service Pump (continued)

SPM® TWS 600S HD Pump - 4.50" Plunger Horsepower Curve



TWS 2250 Frac Pump

The SPM® TWS 2250 frac pump offers great pressure and flow ratings in a smaller package than the large quintuplex pumps available in the market. Standard plunger sizes include Standard plunger sizes are four inch, four and half inch and five inch. They are also available in three and three quarters, five and half and five and three quarters.



APPLICATIONS: Fracturing.

Rated Max Brake HP ..... 2,250 BHP (1,678 kW)
Maximum Rod Load ..... 238,570 lbf (108,213 kg)
Number of Cylinders 3
Stroke Length ..... 8" (203 mm)
Gear Ratio 6.353:1
Length ..... 89.9" (2,284 mm)
Width ..... 59.8" (1,519 mm)
Height ..... 44.3" (1,125 mm)
Weight Dry (Approx.) ..... 11,750 lb (5,330 kg)

Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

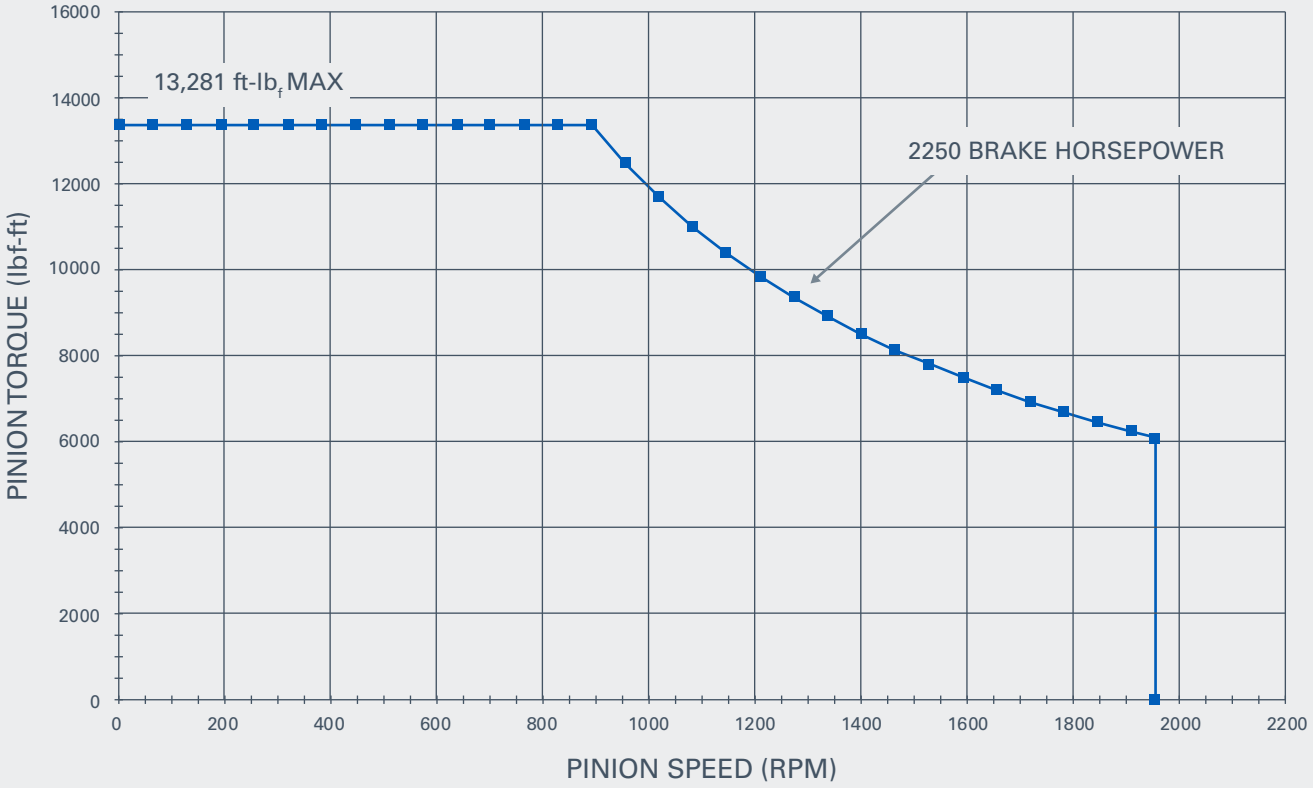
TWS 2250 PUMP - PERFORMANCE CHART[1,2]

Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	318	100	635	140	889	200	1271	250	1588	307	1950
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	1.31 (4.9)	65 (247)	18985 (131)	131 (494)	18985 (131)	183 (692)	18985 (131)	261 (988)	13292 (92)	326 (1235)	10634 (74)	401 (1517)	8659 (60)
4 1/2 (114.3)	1.65 (6.3)	83 (313)	15000 (104)	165 (625)	15000 (1057)	231 (876)	15000 (1057)	330 (1251)	10502 (740)	413 (1564)	8402 (592)	507 (1920)	6842 (482)
5 (127.0)	2.04 (7.7)	102 (386)	12150 (84)	204 (772)	12150 (84)	286 (1081)	12150 (84)	408 (1544)	8507 (59)	510 (1930)	6806 (47)	626 (2370)	5542 (38)
INPUT POWER: BHP (kW)		803 (600)		1607 (1199)		2250 (1679)		2250 (1679)		2250 (1679)		2250 (1679)	

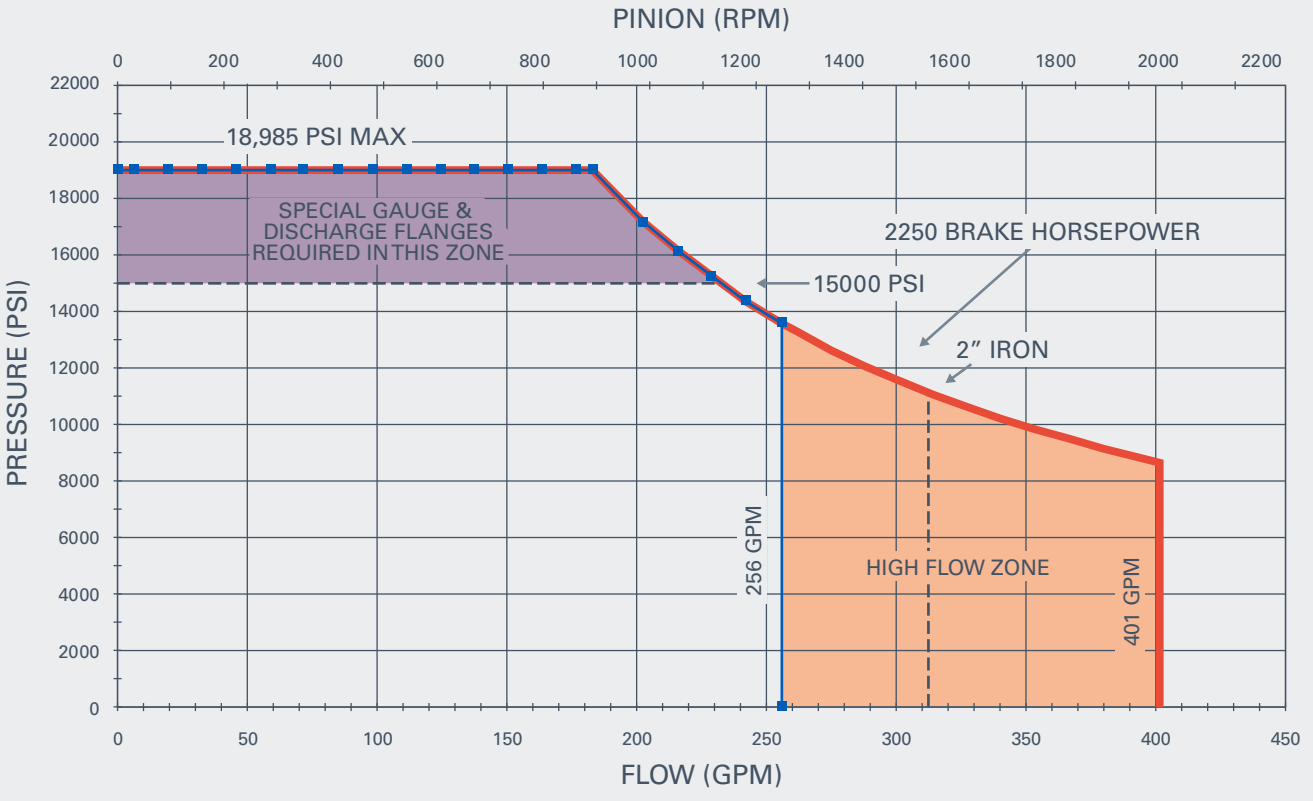
1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM).

TWS 2250 Frac Pump (continued)

SPM® TWS 2250 Pump - Brake Horsepower Curve

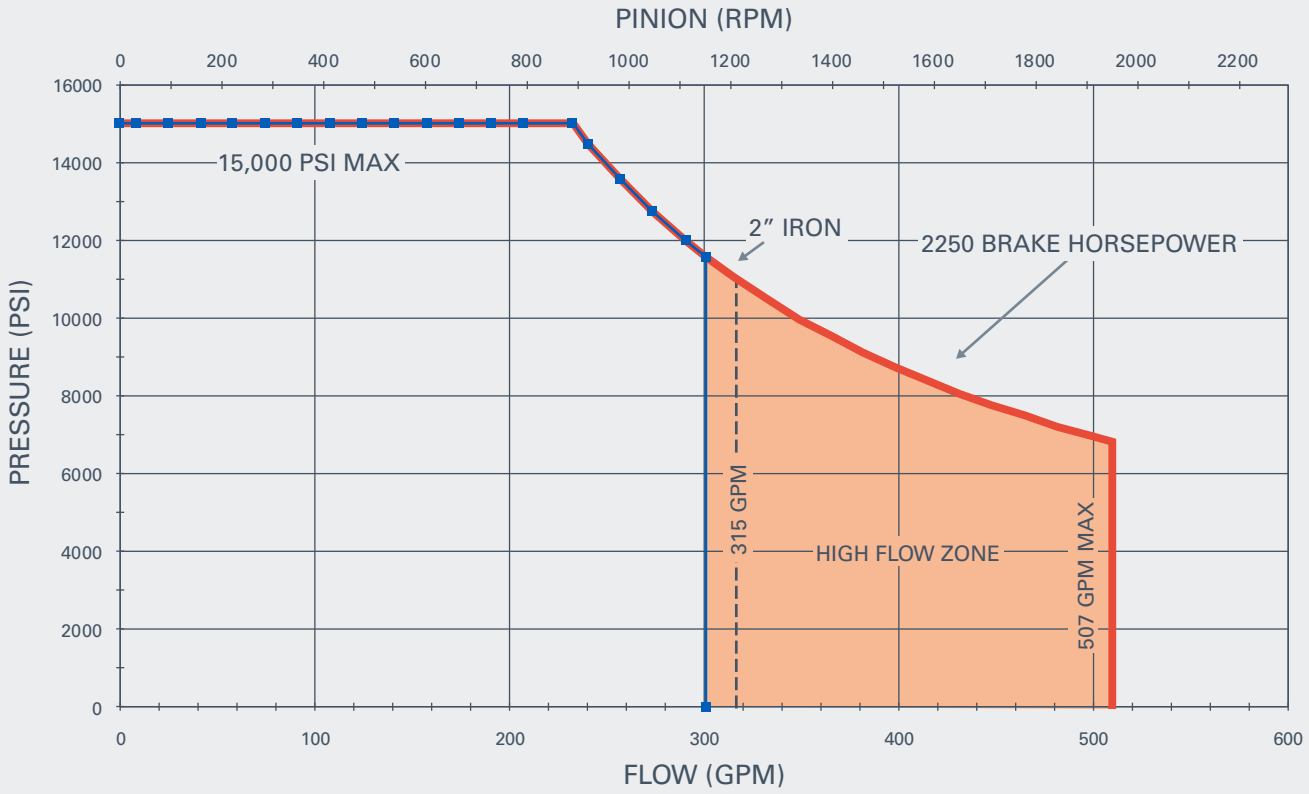


SPM® TWS 2250 Pump - 4.00" Plunger Horsepower Curve

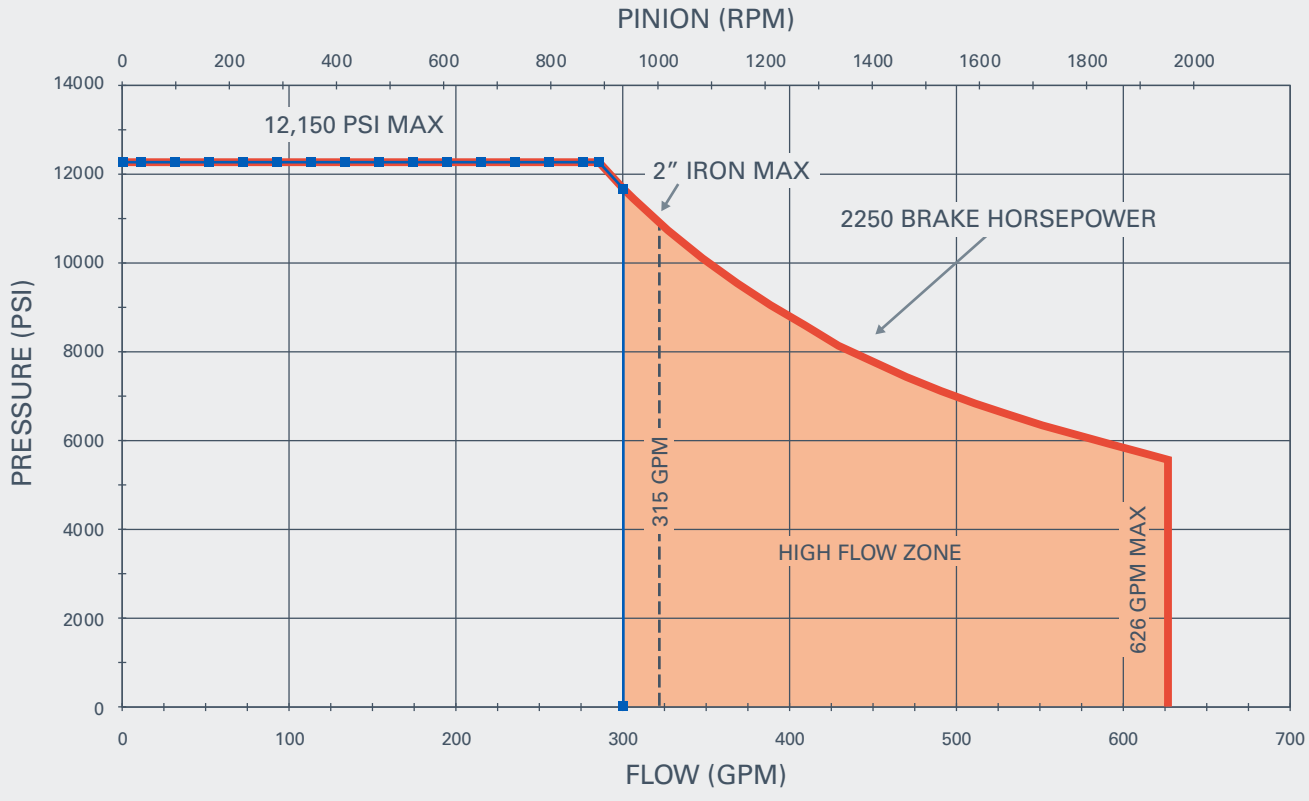


TWS 2250 Frac Pump (continued)

SPM® TWS 2250 Pump - 4.50" Plunger Horsepower Curve

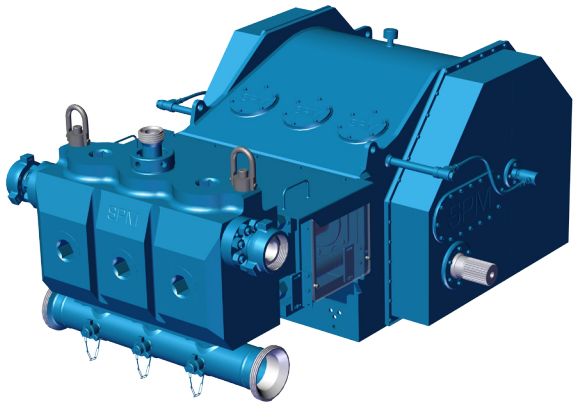


SPM® TWS 2250 Pump - 5.00" Plunger Horsepower Curve



TWS 2400 Frac Pump

The SPM® TWS 2400 frac pump is designed to better handle the extreme operating conditions seen in the new unconventional gas formations. The TWS 2400 pump has successfully completed a 1.5 million cycle test demonstrating its durable design and performance capability. Standard plunger sizes are four inch, four and half inch and five inch. They are also available in three and three quarters, five and half and five and three quarters.



APPLICATIONS: Fracturing.

Rated Max. Brake HP ..... 2,400 BHP (1,790 kW)
Maximum Rod Load ..... 273,000 lbf (123,810 kg)
Number of Cylinders 3
Stroke Length ..... 8" (203 mm)
Gear Ratio 5.588:1
Length ..... 90" (2,381 mm)
Width ..... 60" (1,519 mm)
Height ..... 44" (1,125 mm)
Weight Dry (Approx.) ..... 11,750 lb (5,330 kg)

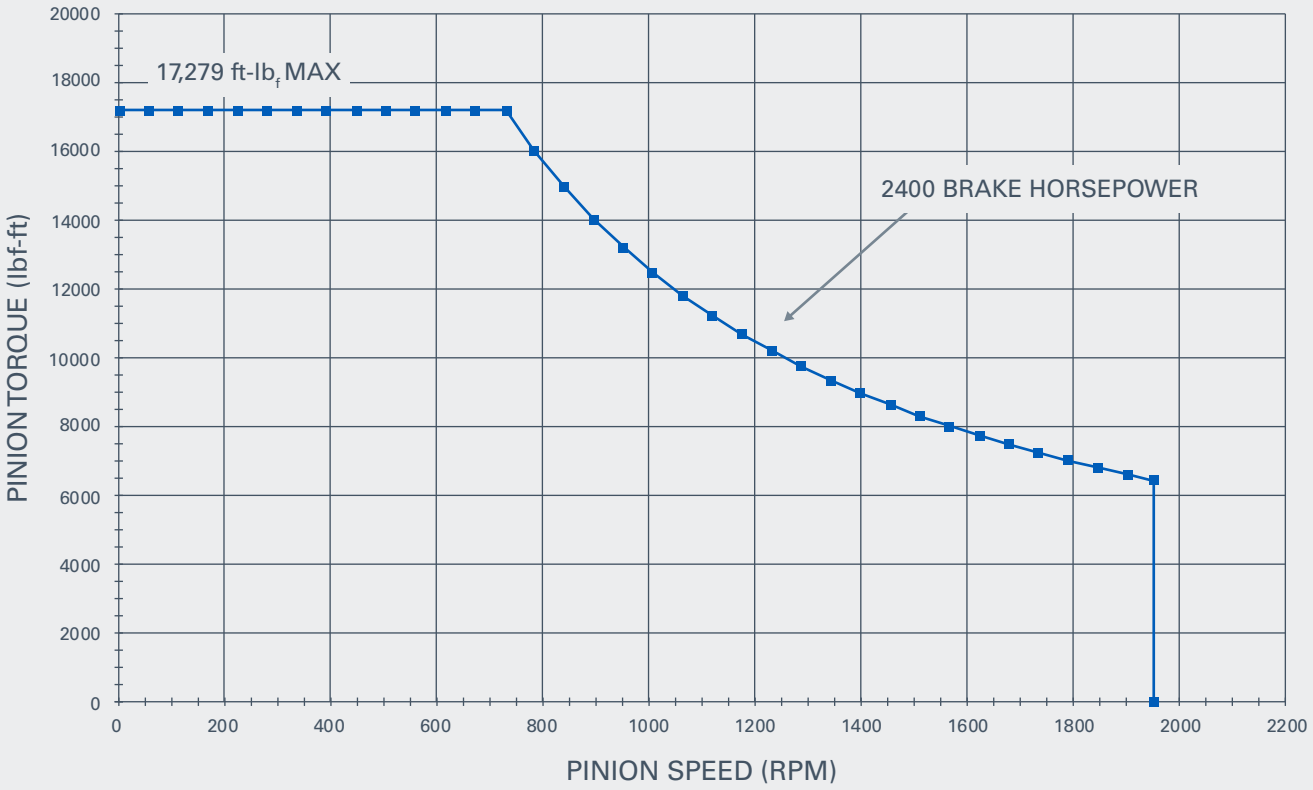
Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

TWS 2400 PUMP - PERFORMANCE CHART[1,2]

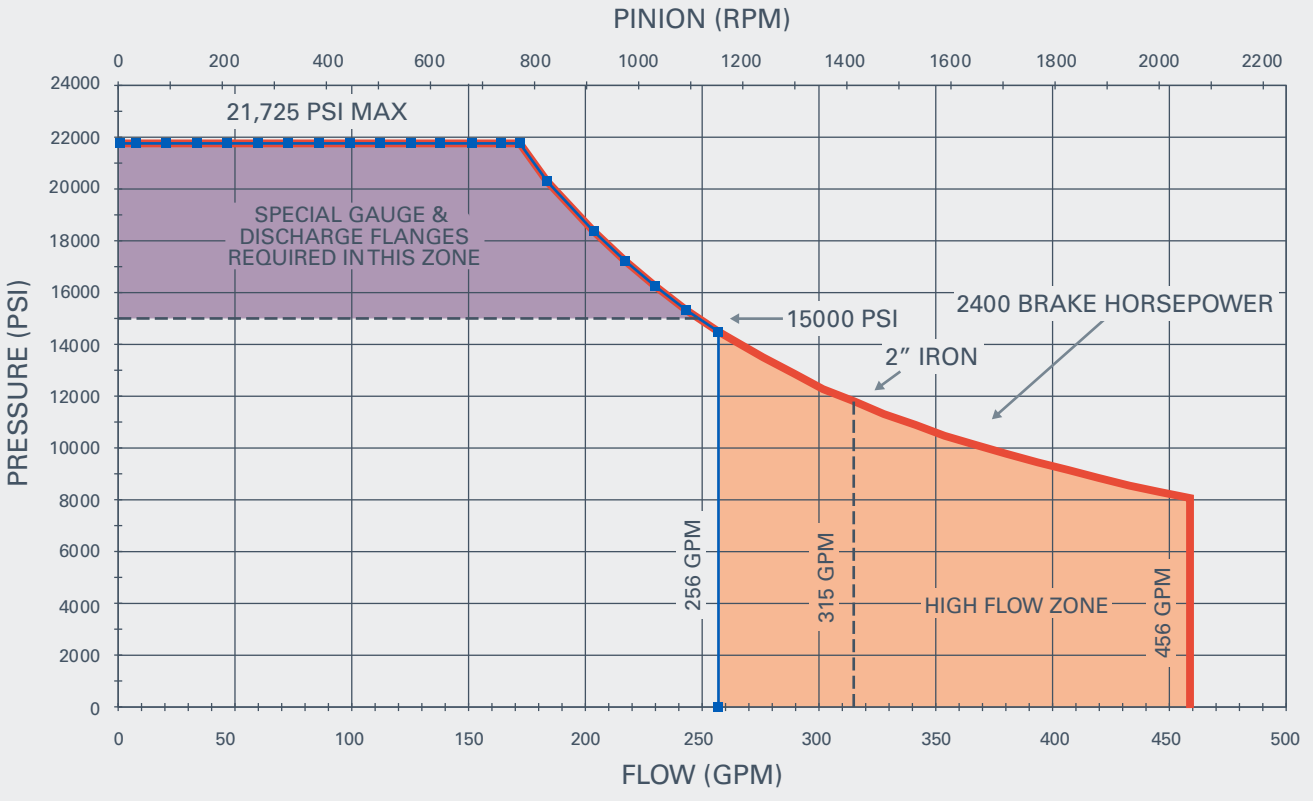
Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	279	100	559	130.5	729	200	1118	275	1534	349	1950
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	1.31 (4.9)	65 (247)	21725 (150)	131 (494)	21725 (150)	170 (645)	21724 (171)	261 (988)	14178 (98)	358 (1356)	10330 (71)	456 (1725)	8125 (56)
4 1/2 (114.3)	1.65 (6.3)	83 (313)	17165 (119)	165 (625)	17165 (119)	216 (816)	17165 (119)	330 (1251)	11203 (77)	454 (1717)	8162 (56)	577 (2183)	6420 (44)
5 (127.0)	2.04 (7.7)	102 (386)	13904 (96)	204 (772)	13904 (96)	266 (1008)	13904 (96)	408 (1544)	9074 (63)	560 (2120)	6611 (46)	712 (2695)	5200 (36)
INPUT POWER: BHP (kW)		919 (686)		1839 (1199)		2400 (1791)		2400 (1791)		2400 (1679)		2400 (1791)	

1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM).

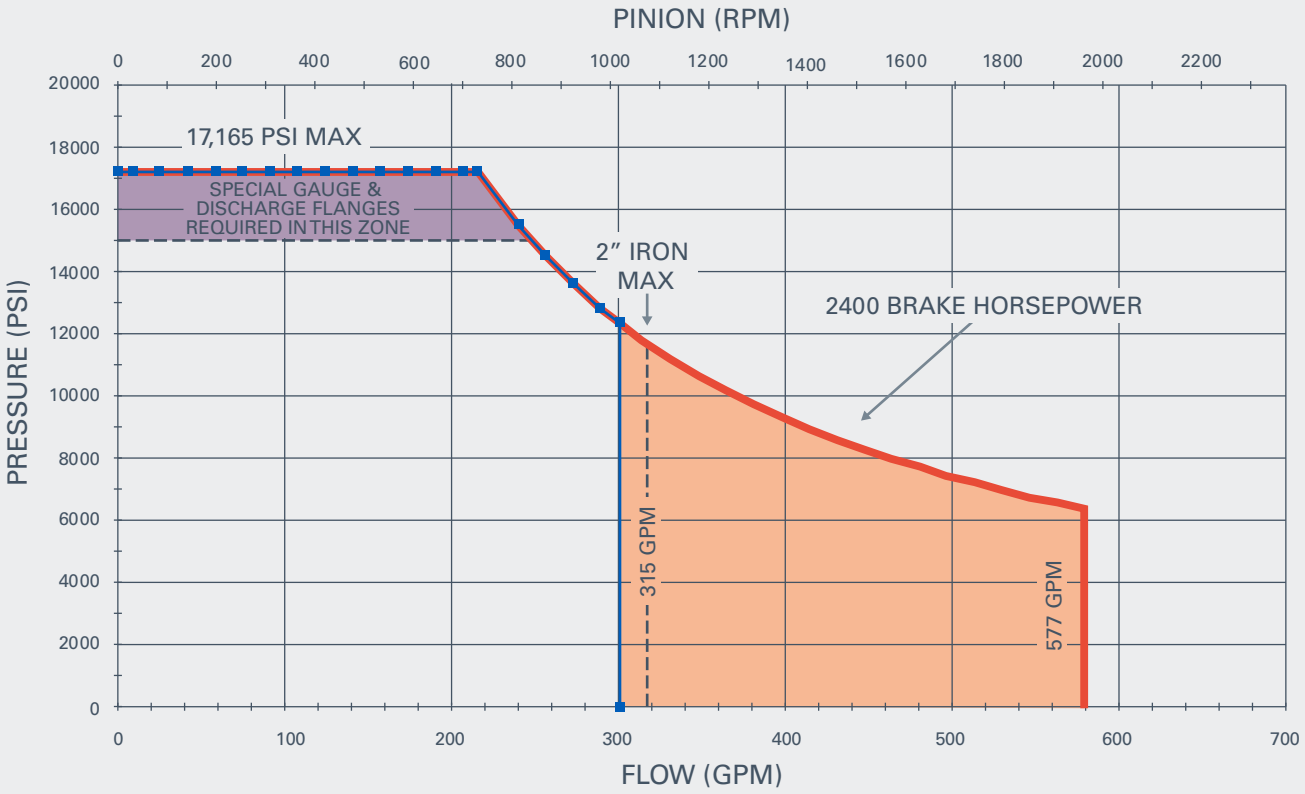
SPM® TWS 2400 Pump - Brake Horsepower Curve



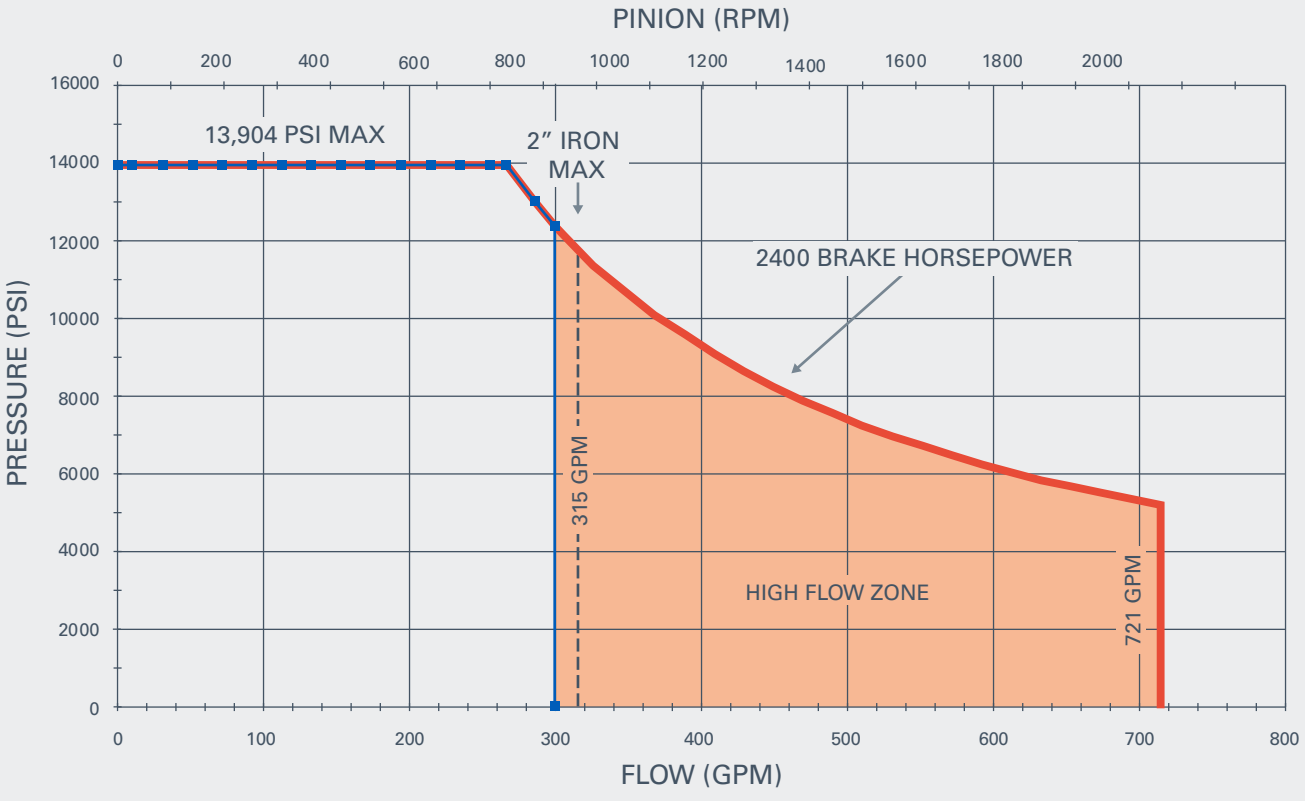
SPM® TWS 2400 Pump - 4.00" Plunger Horsepower Curve



SPM® TWS 2400 Pump - 4.50" Plunger Horsepower Curve

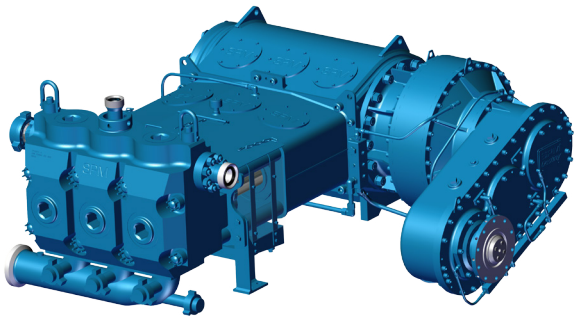


SPM® TWS 2400 Pump - 5.00" Plunger Horsepower Curve



SPM® Destiny® TWS 2500 Frac Pump

The SPM® Destiny® TWS 2500 frac pump is designed for operation in today's harshest multistage frac applications with a 2500 horsepower rating, 273,000 lbf rod load, and 10" stroke. The longer stroke requires fewer cycles to produce an equivalent flow rate compared to an 8" stroke quintuplex pump, resulting in less overall wear on expendables and improved overall pump durability.



APPLICATIONS: Fracturing.

Rated Max. Brake HP ..... 2,500 BHP (1,854 kW)
Maximum Rod Load ..... 273,000 lb (123,810 kg)
Stroke Length ..... 10" (254 mm)
Gear Ratio 6.375:1
Length ..... 91" (2,311 mm)
Width ..... 88" (2,235 mm)
Height ..... 39" (9,991 mm)
Weight Dry (Approx.) ..... 14,450 lb (6,560 kg)

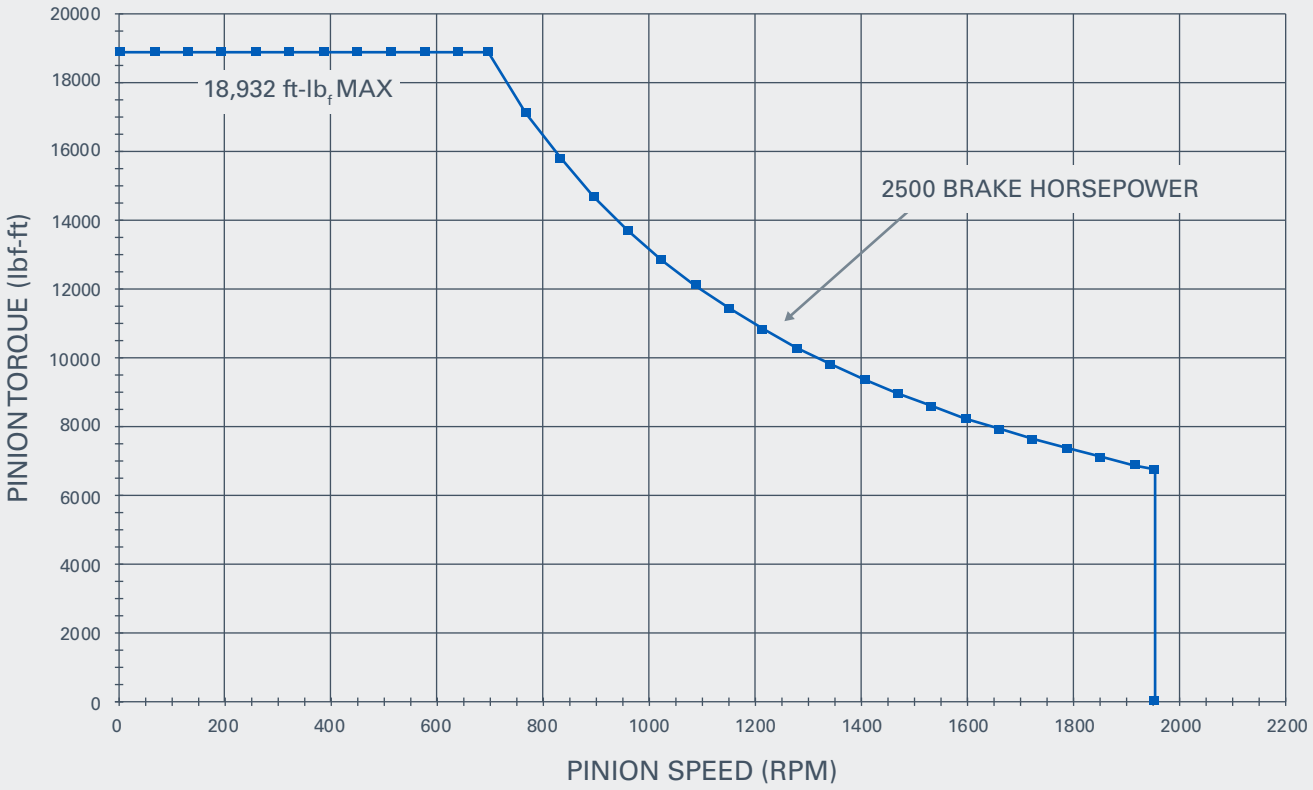
Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

DESTINY® TWS 2500 PUMP - PERFORMANCE CHART[1,2]

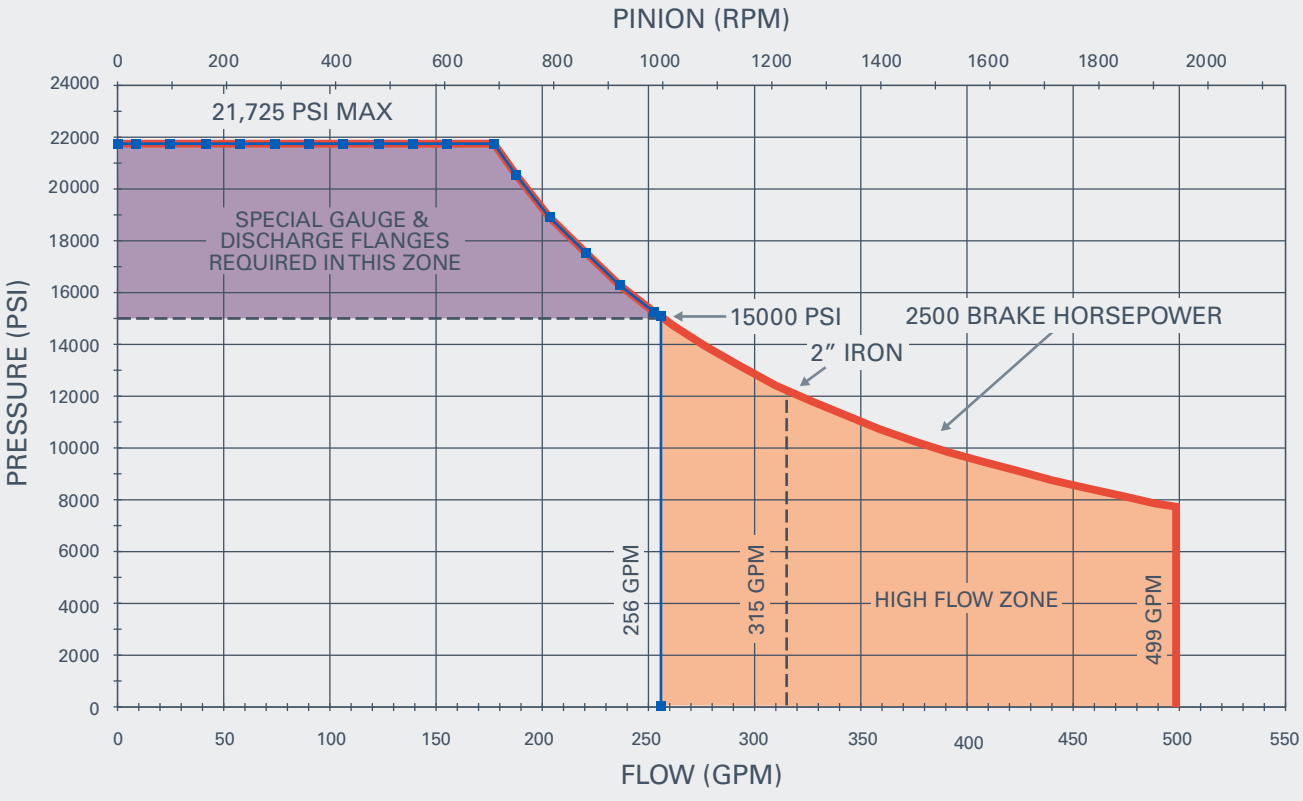
Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	319	109	693	150	956	200	1275	250	1594	306	1950
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	1.63 (6.2)	82 (309)	21725 (150)	178 (672)	21725 (150)	245 (927)	15754 (109)	326 (1236)	11815 (81)	408 (1544)	9452 (65)	499 (1890)	7722 (53)
4 1/2 (114.3)	2.07 (7.8)	103 (391)	17165 (118)	225 (850)	17165 (118)	310 (1173)	12447 (86)	413 (1564)	9336 (64)	516 (1955)	7468 (51)	632 (2393)	6102 (42)
5 (127)	2.55 (9.7)	128 (483)	13904 (96)	277 (1050)	13904 (96)	383 (1448)	10082 (70)	510 (1931)	7562 (52)	638 (2413)	6049 (42)	780 (2954)	4942 (34)
INPUT POWER: BHP (kW)		1149 (858)		2500 (1866)		2500 (1866)		2500 (1866)		2500 (1866)		2500 (1866)	

1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM)
4 Cells highlighted in orange are intermediate zones where erosion is more prevalent when 4" iron is used (MAX1446GPM when fluid end bridle is used).

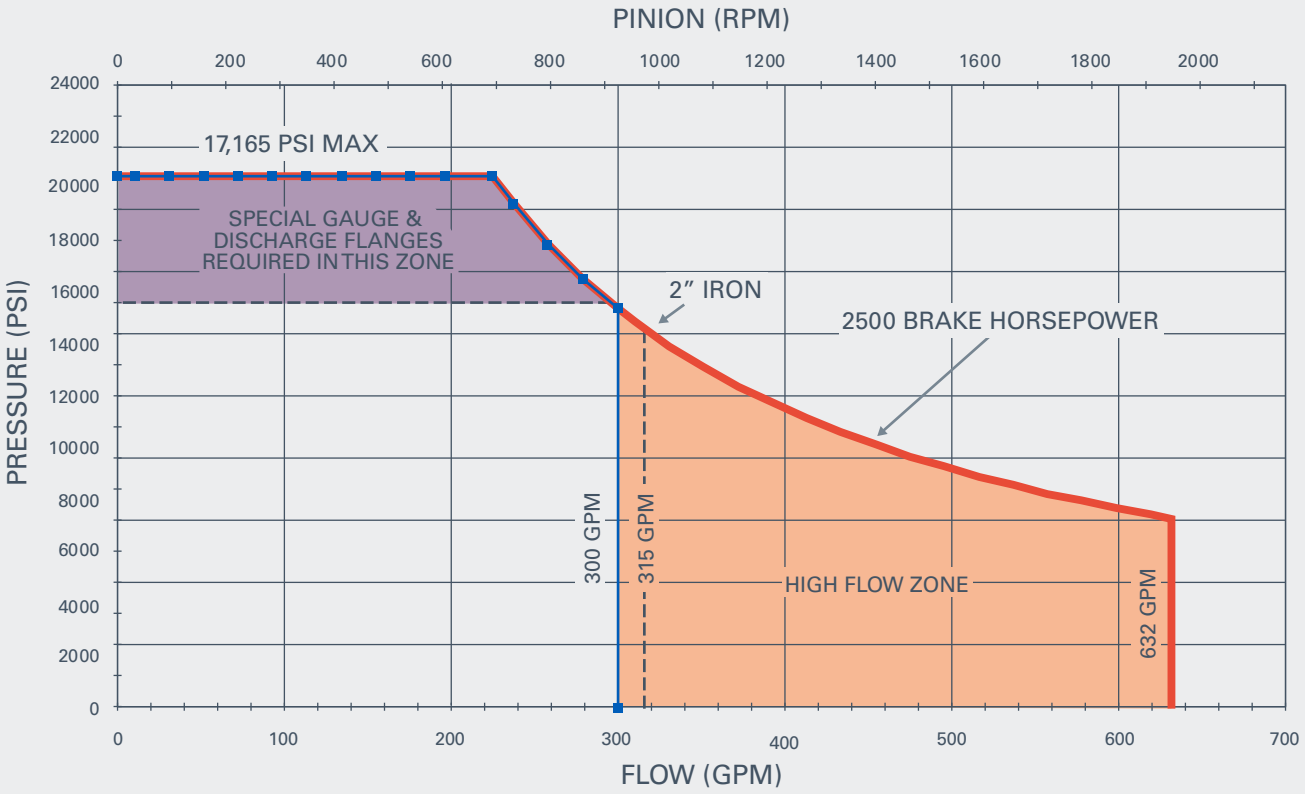
SPM® Destiny® TWS 2500 Pump - Brake Horsepower Curve



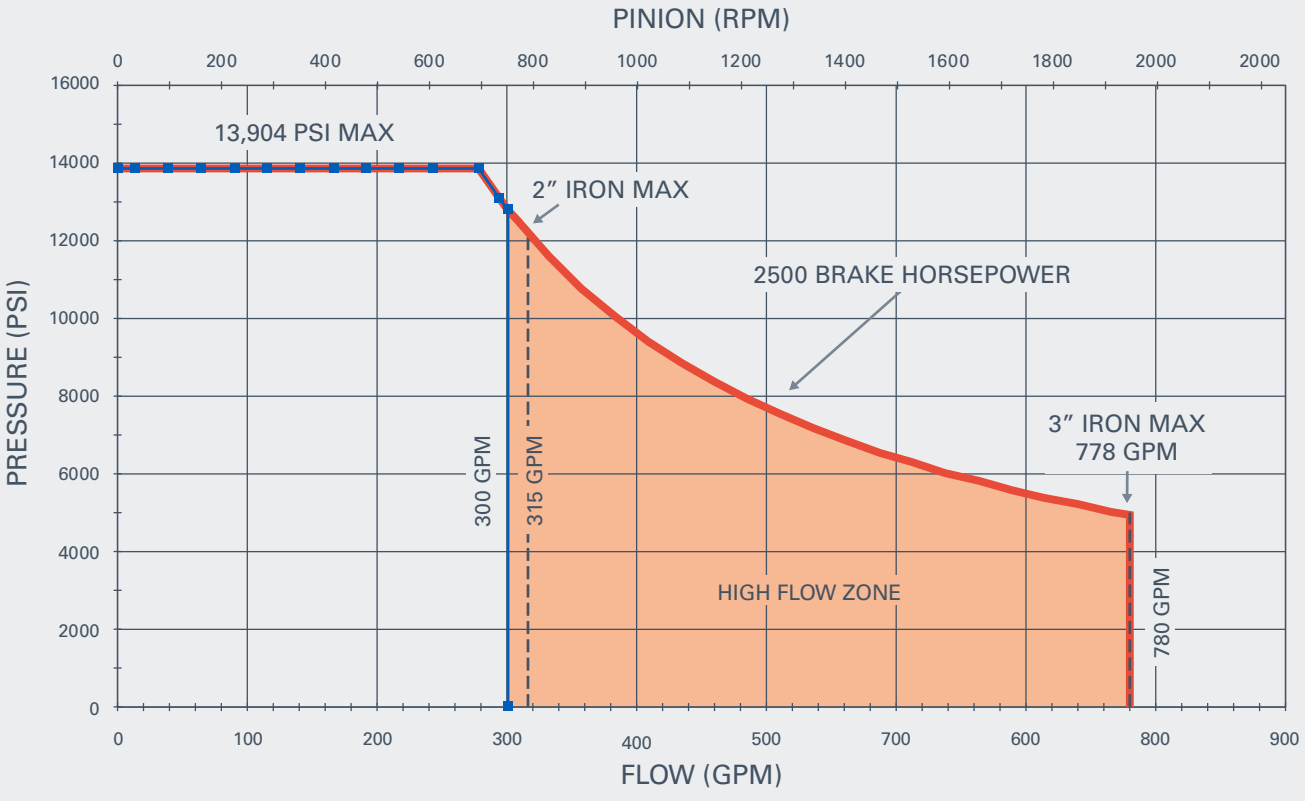
SPM® Destiny® TWS 2500 Pump - 4.00" Plunger Horsepower Curve



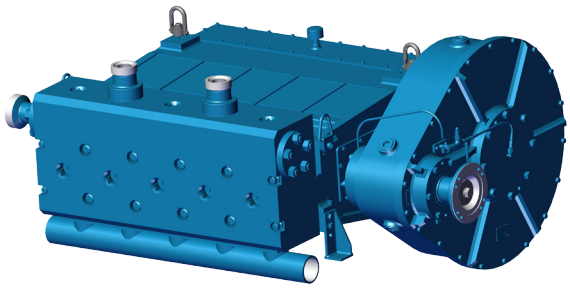
SPM® Destiny® TWS 2500 Pump - 4.50" Plunger Horsepower Curve



SPM® Destiny® TWS 2500 Pump - 5.00" Plunger Horsepower Curve



QWS 1000S HD Well Service Pump



The SPM® QWS 1000S HD pump is specifically engineered to reduce downtime due to maintenance while improving rod load and high pressure capabilities.

The Heavy Duty design is built with quick and practical maintenance in mind, while supplying 6% higher rod load at pressures of 15,000psi utilizing a 3" plunger and 20,000psi utilizing a 2.5" plunger. The QWS 1000S HD pump has been designed to eliminate contamination from pumping media into the power end, lengthening pump component life. Retrofit kits are available for customers currently operating QWS 1000S pumps, helping them make the transition to the QWS 1000S HD pump. Customers are able to update their units to the latest technology without the capital investment of a complete new unit.

APPLICATIONS: Cementing, acidizing, gravel packing, snubbing.

Rated Max Brake HP ..... 1,000 BHP (746 kW)
Maximum Rod Load ..... 106,000 lbf (48,094 kg)
Number of Cylinders 5
Stroke Length ..... 6" (152.4 mm)
Gear Ratio 4.61:1
Length ..... 50" (1,270 mm)
Width ..... 73" (1,854 mm)
Height ..... 24" (609 mm)
Weight Dry (Approx.) ..... 7,040 lb (3,193 kg)

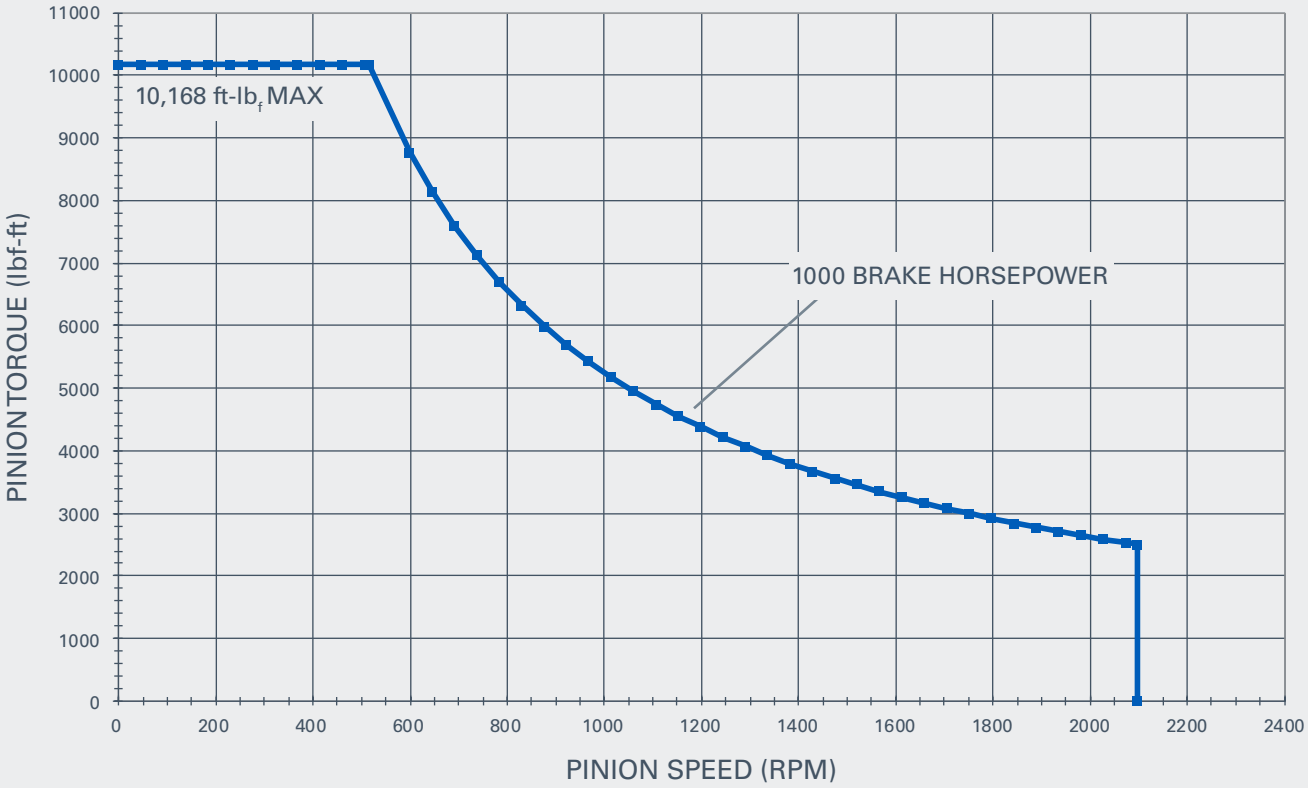
Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

QWS 1000S HD PUMP PERFORMANCE CHART[1,2]

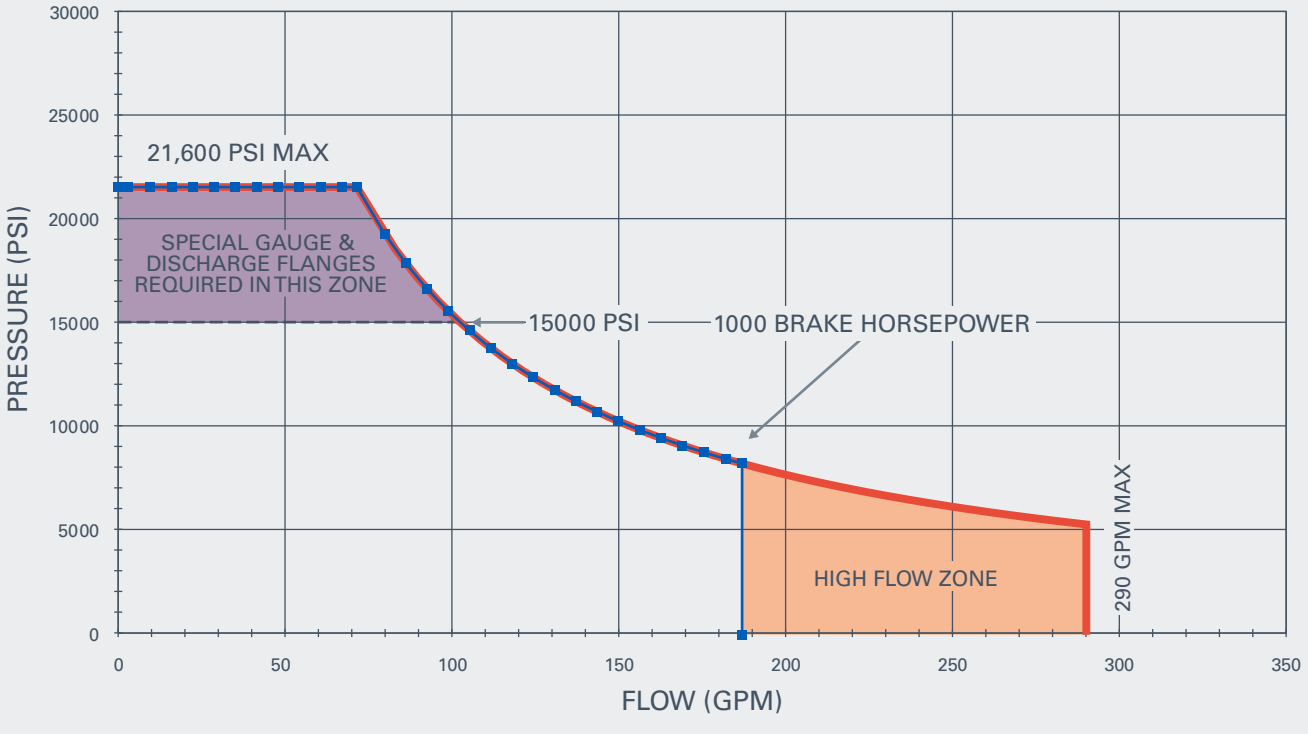
Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	231	100	461	112	516	200	922	350	1614	455	2096
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
2 1/2 (63.5)	0.6375 (2.4)	32 (121)	21600 (149)	64 (241)	21600 (149)	71 (270)	21600 (149)	127 (483)	12099 (84)	223 (845)	6914 (48)	290 (1097)	5323 (37)
2 3/4 (69.9)	0.7714 (2.9)	39 (146)	17851 (123)	77 (292)	17851 (123)	86 (327)	17851 (123)	154 (584)	9999 (69)	270 (1022)	5714 (40)	351 (1327)	4399 (30)
3 (88.9)	0.9180 (3.5)	46 (174)	15000 (104)	92 (347)	15000 (104)	103 (389)	15000 (104)	184 (695)	8402 (58)	321 (1216)	4801 (33)	417 (1580)	3696 (26)
3 1/2 (88.9)	1.2495 (4.7)	62 (236)	11020 (76)	125 (473)	11020 (76)	140 (530)	11020 (76)	250 (946)	6173 (43)	437 (1655)	3527 (24)	568 (2150)	2716 (19)
4 (101.6)	1.6320 (6.2)	82 (309)	8438 (58)	163 (618)	8438 (58)	183 (692)	8438 (58)	326 (1235)	4726 (33)	571 (2162)	2701 (19)	742 (2808)	2079 (14)
4 1/2 (114.3)	2.0655 (7.8)	103 (391)	6667 (46)	207 (782)	6667 (46)	231 (876)	6667 (46)	413 (1564)	3734 (26)	723 (2736)	2134 (15)	939 (3554)	1643 (11)
INPUT POWER: BHP (kW)		446 (333)		893 (666)		1000 (746)		1000 (746)		1000 (746)		1000 (746)	

1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM)
4 Cells highlighted in orange are intermediate zones where erosion is more prevalent when 4" iron is used (MAX1446GPM when fluid end bridle is used).

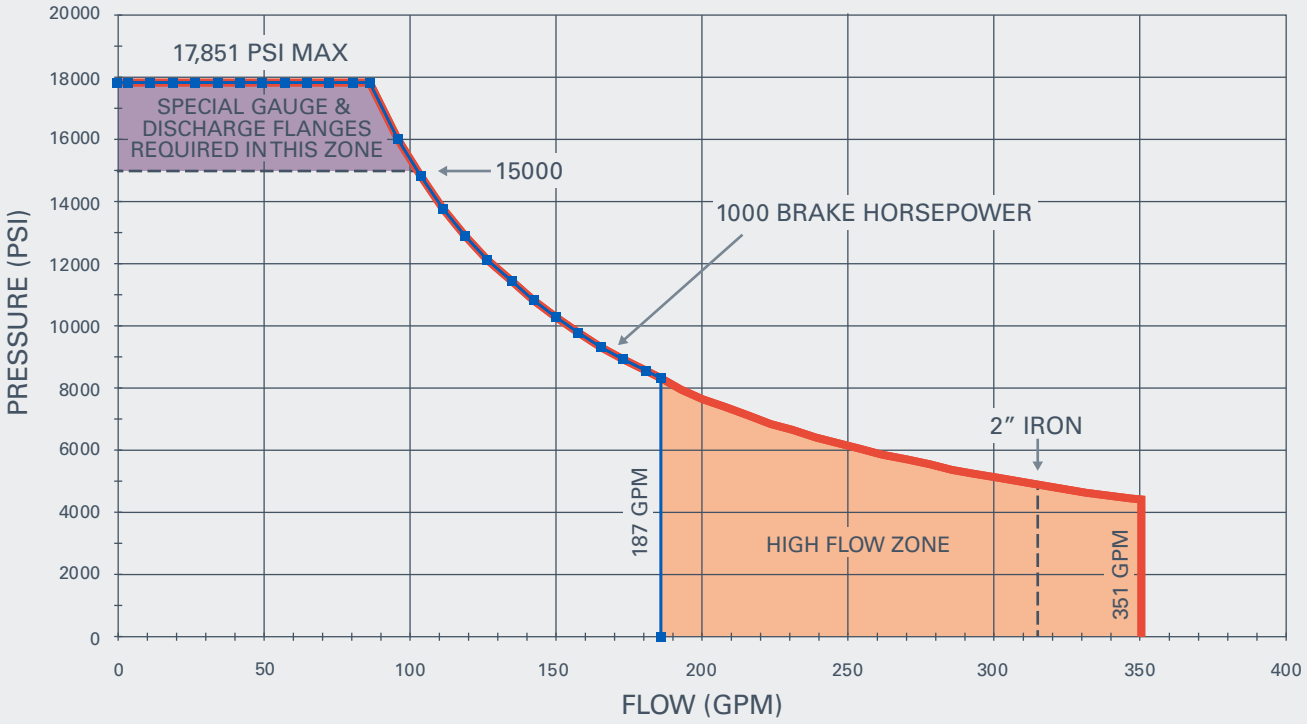
SPM® QWS 1000S HD Pump - Brake Horsepower Curve



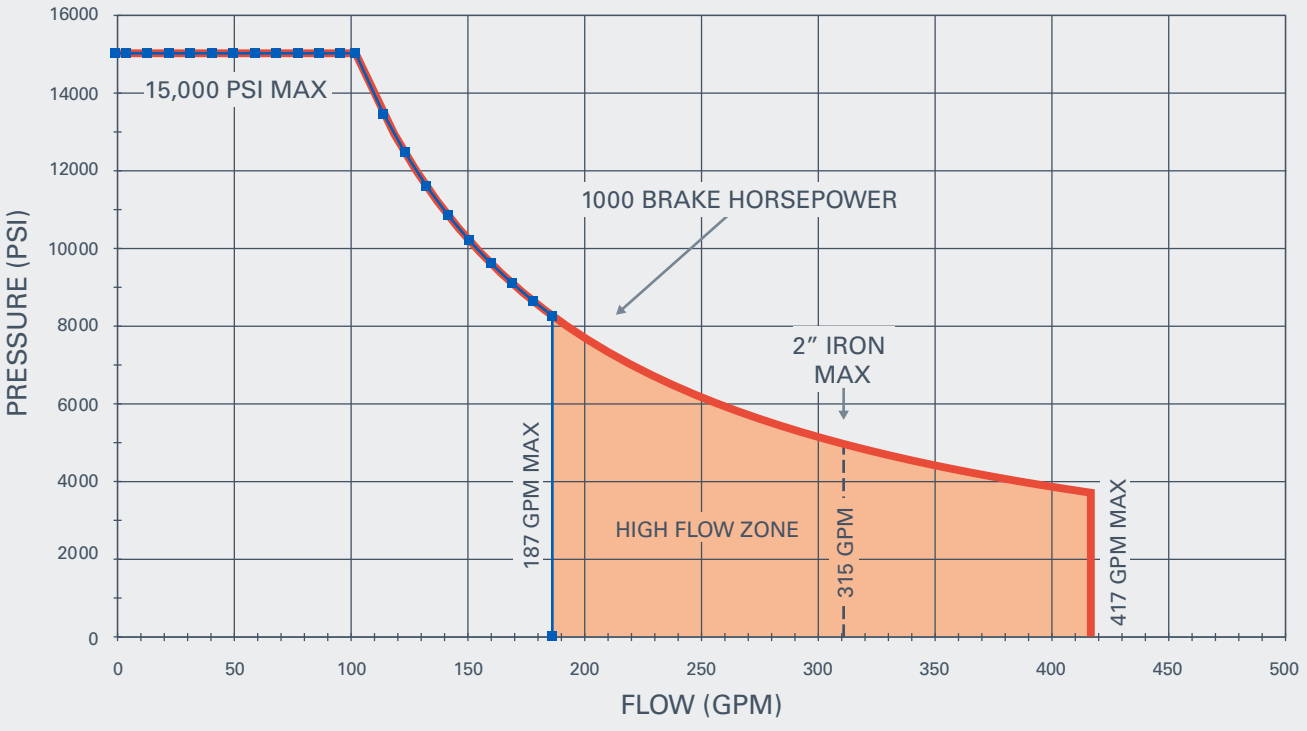
SPM® QWS 1000S HD Pump - 2.50" Plunger Horsepower Curve



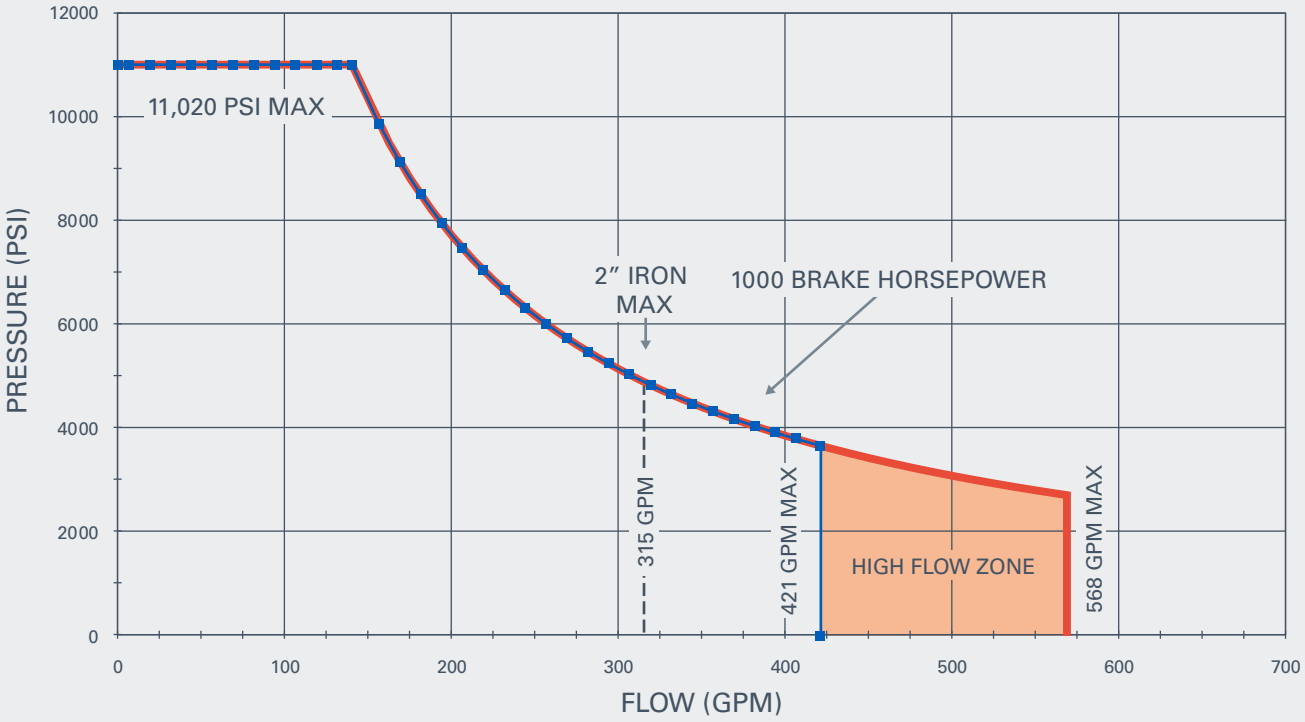
SPM® QWS 1000S HD Pump - 2.75" Plunger Horsepower Curve



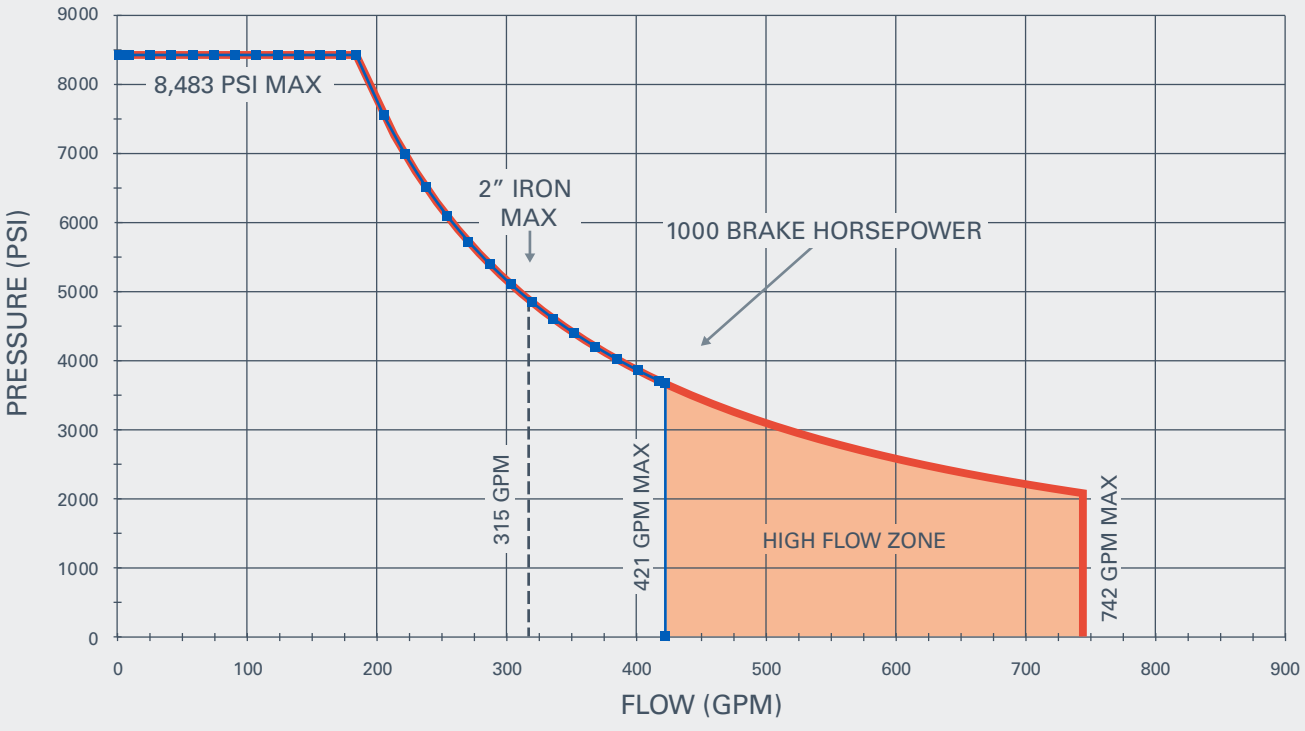
SPM® QWS 1000S HD 3.00" Pump - Plunger Horsepower Curve



SPM® QWS 1000S HD Pump - 3.50" Plunger Horsepower Curve

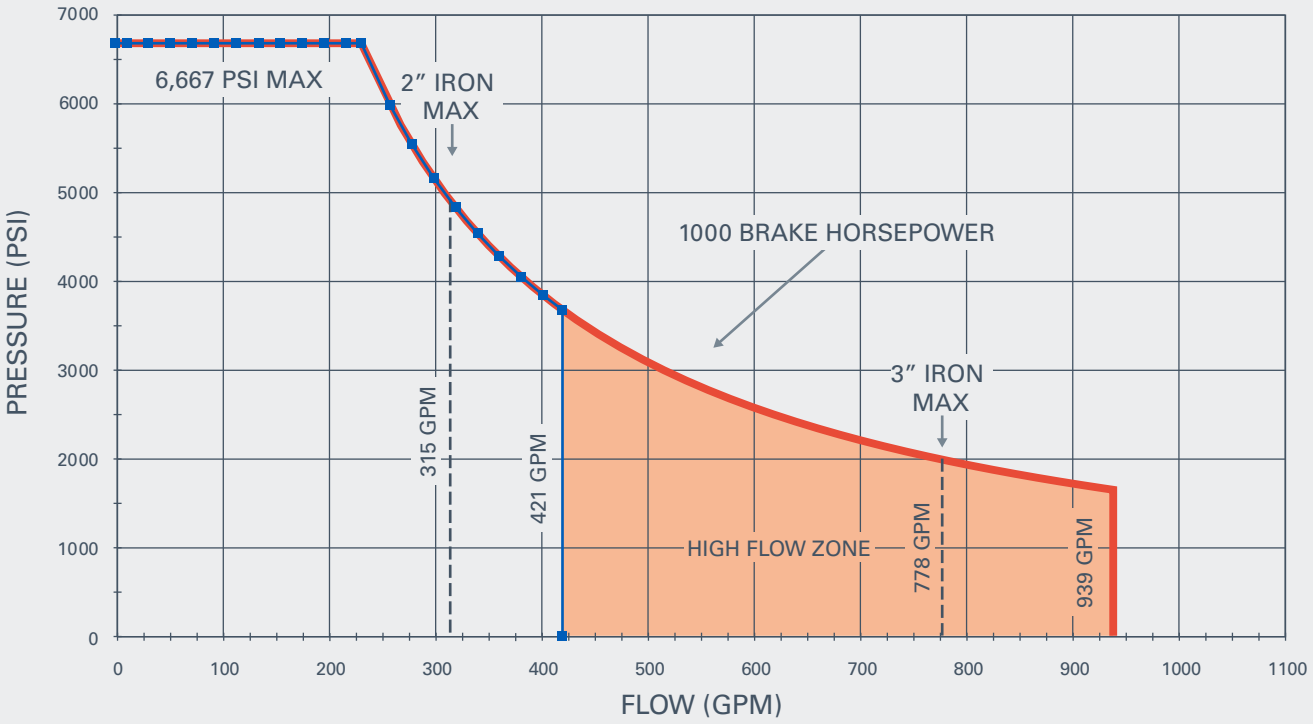


SPM® QWS 1000S HD Pump - 4.00" Plunger Horsepower Curve

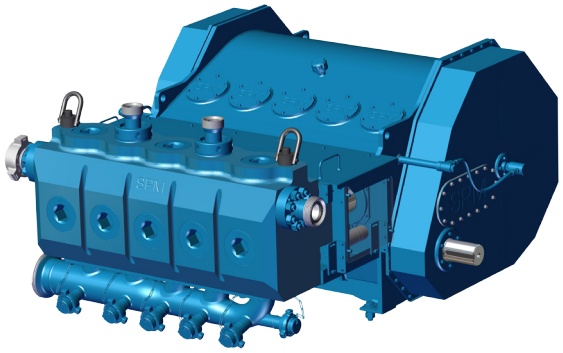


QWS 1000S HD Well Service Pump (continued)

SPM® QWS 1000S HD Pump - 4.50" Plunger Horsepower Curve



QWS 2500 SD Frac Pump



The SPM® QWS 2500 SD frac pump is the latest generation of the SPM® QWS 2500, the traditional offering. The latest model improves on frame durability, reducing welding and adding material where practical, both of which reduce the potential for frame cracking and increase fatigue life over previously designed pumps. Also improved are the performance and serviceability of the pinion bearing, through the addition of a bolt-on bearing carrier, a larger size pinion bearing, and enhanced lubrication through the bearing groove.

The QWS 2500 SD pump can be equipped with the SPM® Duralast™ fluid end which is proven to double the life of the fluid end over conventional technology. This patented combination is designed to significantly increase system uptime, decrease operating costs, and lower total cost of ownership over the life of the pumping asset.

APPLICATIONS: Fracturing.

Rated Max. Brake HP ..... 2,500 BHP (1,866 kW)
Maximum Rod Load ..... 192,325 lbf (87,239 kg)
Number of Cylinders 5
Stroke Length ..... 8" (203 mm)
Gear Ratio 6.353:1
Length ..... 84 3/4" (2,153 mm)
Width ..... 73 7/8" (1,877 mm)
Height ..... 43 3/8" (1,102 mm)
Weight Dry (Approx.) ..... 16,000 lb (7,257 kg)

Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir.

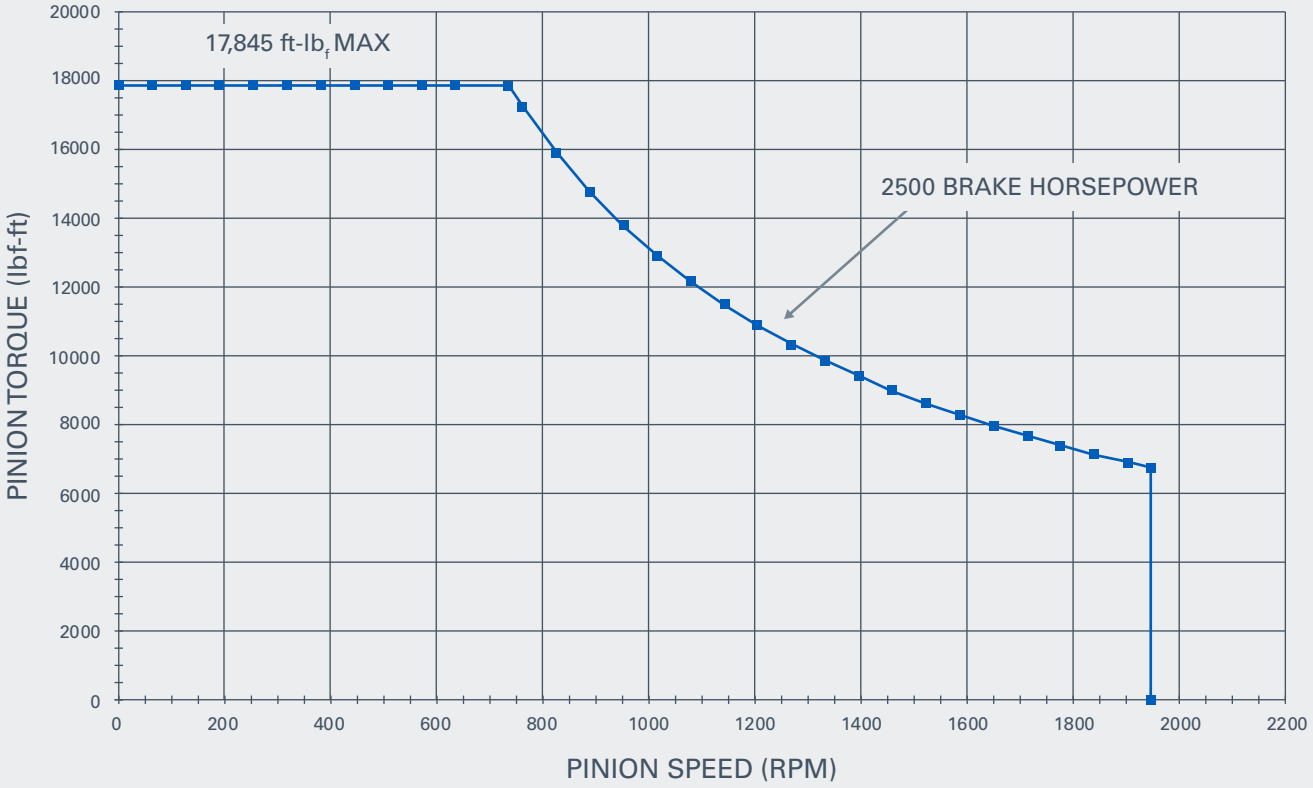
QWS 2500 SD PUMP PERFORMANCE CHART[1,2]

Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		100	635	116	736	150	953	200	1271	250	1588	307	1950
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	2.18 (8.2)	218 (824)	15305 (106)	252 (954)	15305 (120)	326 (1235)	11815 (82)	435 (1647)	8861 (61)	544 (2059)	7089 (49)	668 (2529)	5773 (40)
4 1/2 (114.3)	2.75 (10.4)	275 (1042)	12093 (84)	319 (1207)	12093 (84)	413 (1564)	9336 (65)	551 (2085)	7002 (48)	688 (2606)	5601 (39)	845 (3200)	4561 (32)
5 (127.0)	3.40 (12.9)	340 (1287)	9795 (68)	394 (1490)	9795 (68)	510 (1930)	7562 (52)	680 (2574)	5671 (39)	850 (3217)	4537 (31)	1044 (3951)	3695 (26)
INPUT POWER: BHP (kW)		2159 (1611)		2500 (1865)		2500 (1865)		2500 (1865)		2500 (1865)		2500 (1865)	

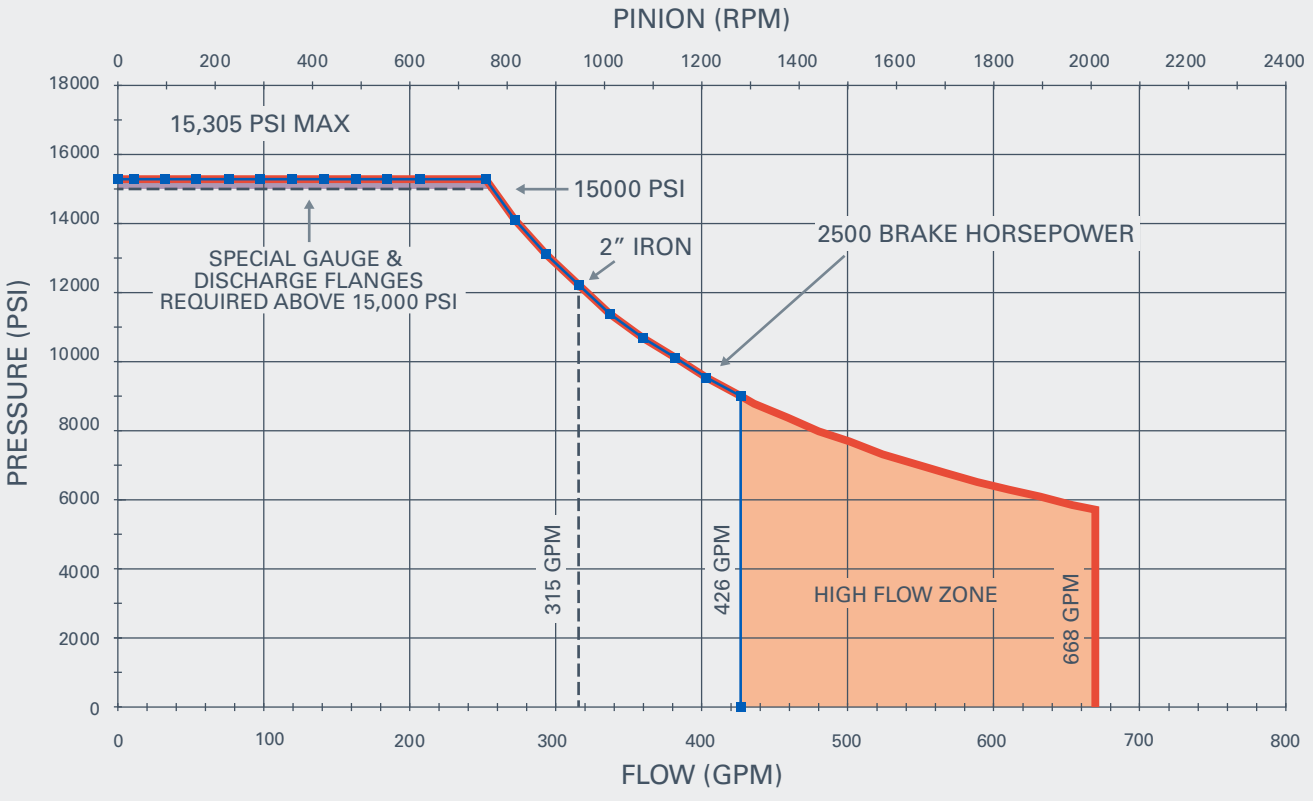
1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM)
4 Cells highlighted in orange are intermediate zones where erosion is more prevalent when 4" iron is used (MAX1446GPM when fluid end bridle is used).

QWS 2500 SD Frac Pump (continued)

SPM® QWS 2500 SD Pump - Brake Horsepower Curve

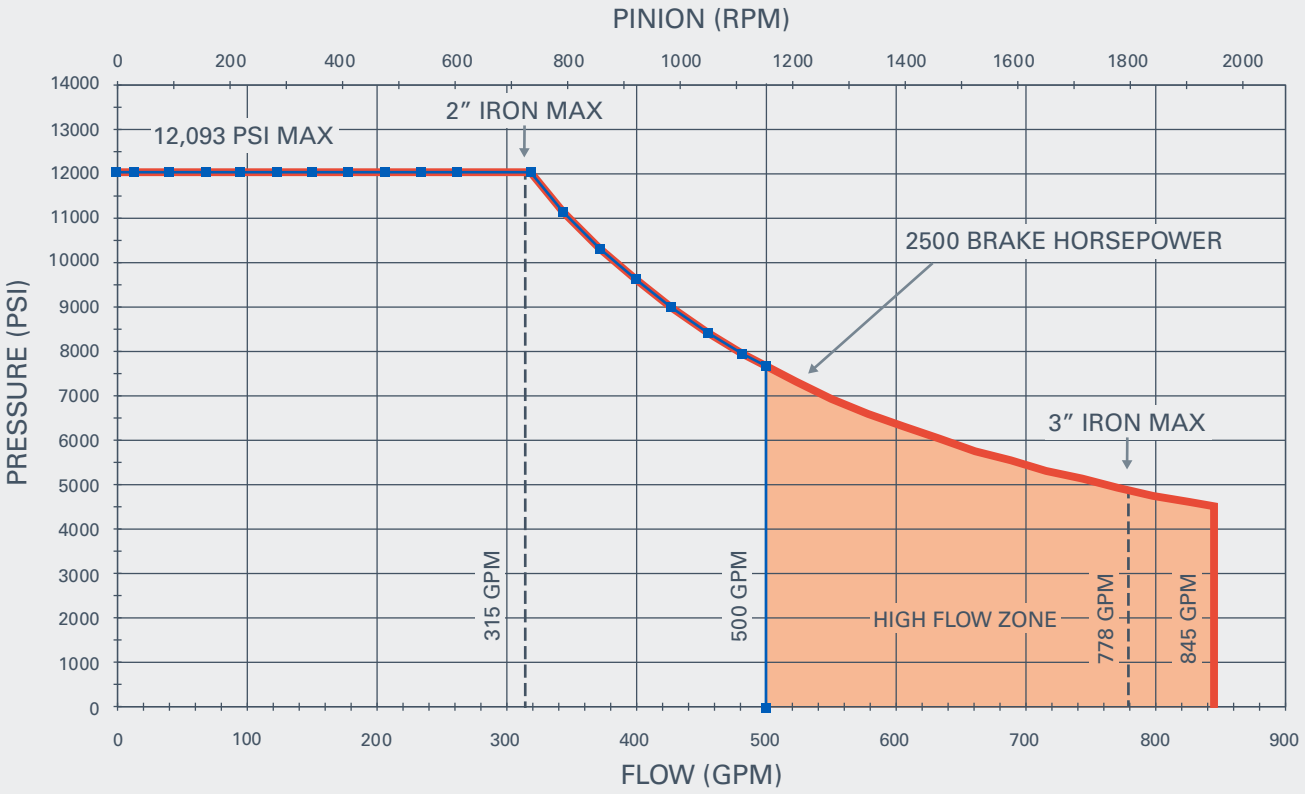


SPM® QWS 2500 SD Pump - 4.00" Plunger Horsepower Curve

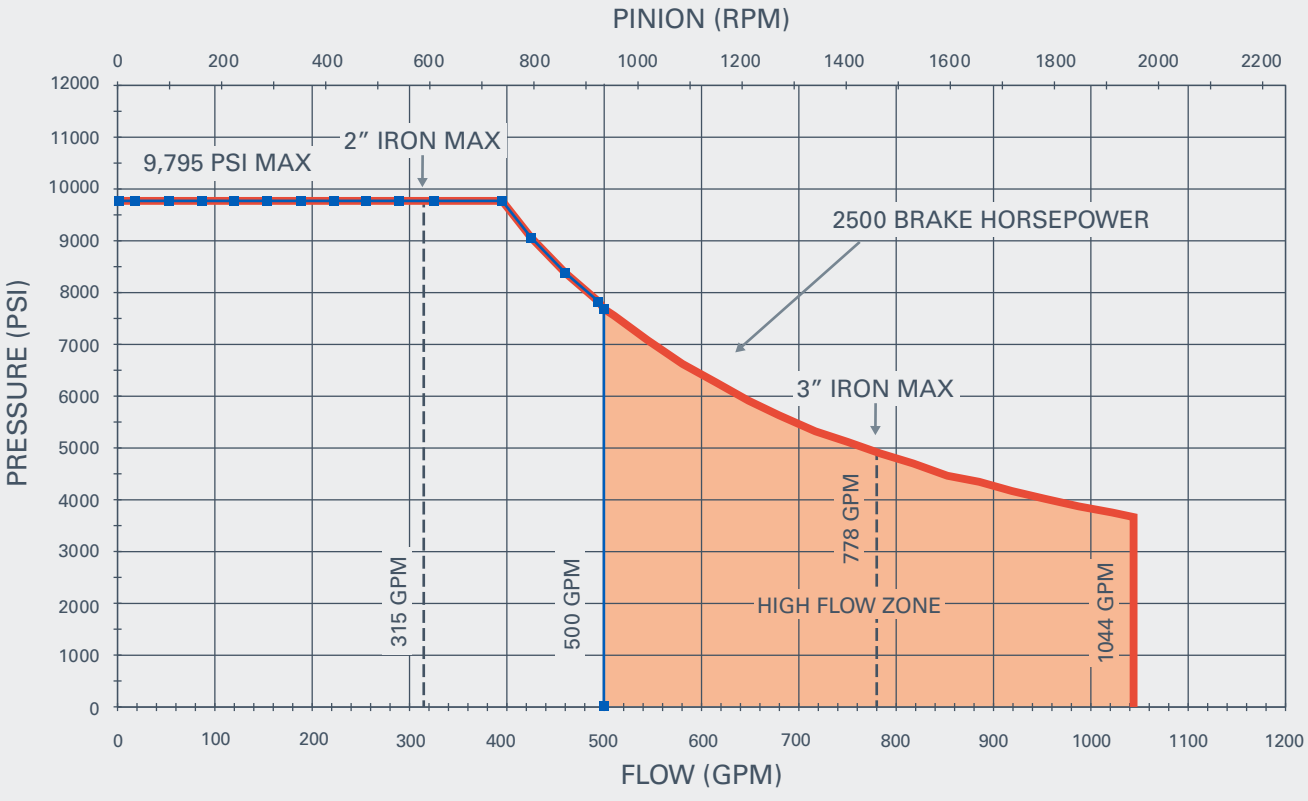


QWS 2500 SD Frac Pump (continued)

SPM® QWS 2500 SD Pump - 4.50" Plunger Horsepower Curve

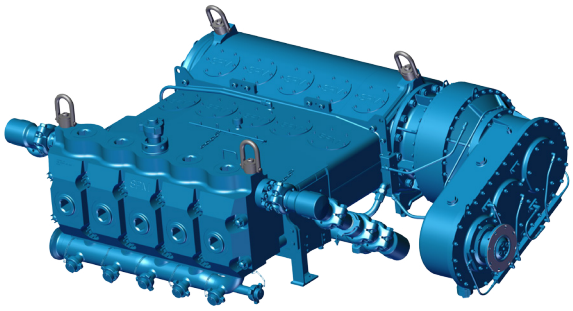


SPM® QWS 2500 SD Pump - 5.00" Plunger Horsepower Curve



SPM® Destiny® QWS 2800

The SPM® Destiny® QWS 2800 frac pump is equipped with a 2800-BHP and 273,000 lbf rod load rating. The 10" stroke design delivers higher flow output compared to an 8" stroke equivalent pump. The SPM® Destiny® QWS 2800 frac pump has a one-piece stay rod design which connects the fluid end directly to the power frame for enhanced durability and operation. The combination of SPM® Duralast™ fluid end technology with the reliability of the SPM® Destiny® QWS 2800 pump's enhanced power end enables customrs to reduce their total cost of ownership and reduce their operating cost.



APPLICATIONS: Fracturing.

Maximum brake horsepower input ..... 2,800 BHP
Maximum rod load capacity ..... 273,000 lbf (123,810 kg)
Stroke length ..... 10" (254 mm)
Gear ratio 6.933:1
Approximate length ..... 90" (2,309 mm)
Approximate width ..... 115" (2,921 mm)
Approximate height ..... 44" (1,118 mm)
Approximate weight (dry, with suction manifold) ..... 20,592 lb (9,339 kg)

Note: Pump dimensions and weight are approximate. For full, detailed drawings, please contact Weir SPM.

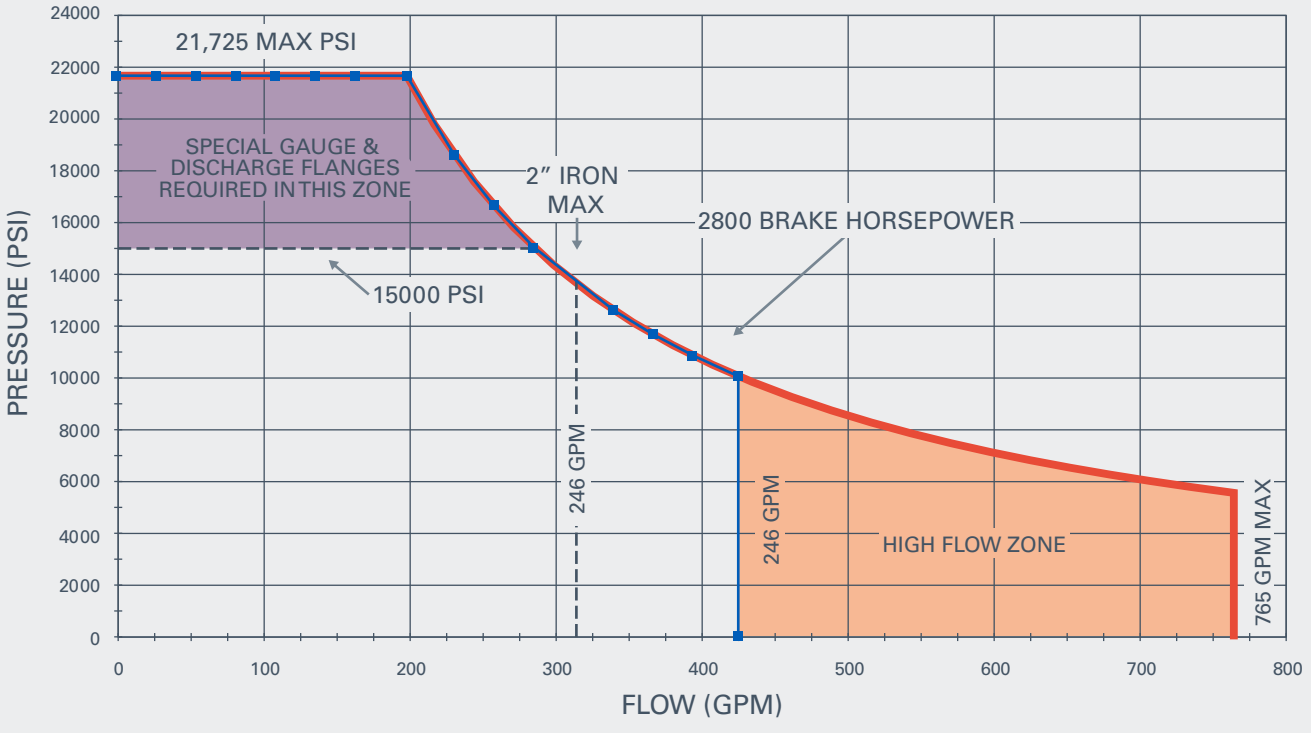
SPM® DESTINY® QWS 2800 PUMP - PERFORMANCE CHART[1,2]

Plunger Diameter	Displace. Per Rev	DISPLACEMENT AT PUMP STROKES PER MINUTE/PINION RPM											
		50	319	109	693	150	956	200	1275	250	1594	306	1951
in (mm)	gal/rev (liter/rev)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)	gpm (lpm)	psi (MPa)
4 (101.6)	2.72 (10.3)	136 (515)	21725 (150)	296 (1120)	14599 (101)	408 (1544)	10586 (73)	544 (2059)	7940 (55)	680 (2574)	6352 (44)	832 (3151)	5189 (36)
4 1/2 (114.3)	3.44 (13)	172 (652)	17165 (118)	374 (1417)	11535 (80)	516 (1955)	8365 (58)	689 (2606)	6273 (43)	861 (3258)	5019 (35)	1053 (3988)	4100 (28)
5 (127)	4.25 (16.1)	213 (804)	13904 (96)	462 (1750)	9344 (64)	638 (2413)	6775 (47)	850 (3218)	5082 (35)	1063 (4022)	4065 (28)	1301 (4923)	3321 (23)
INPUT POWER: BHP (kW)		1915 (1429)		2800 (2089)		2800 (2089)		2800 (2089)		2800 (2089)		2800 (2089)	

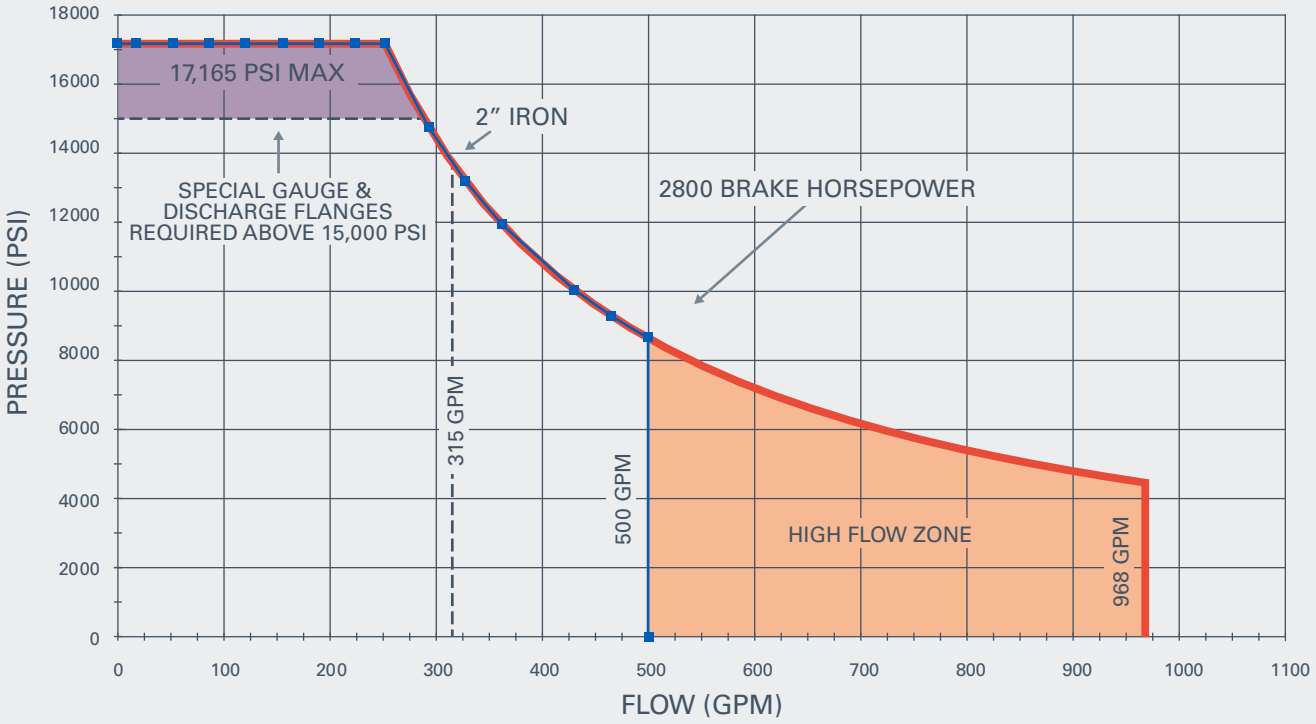
1 Based on 90% ME and 100% VE ---- intermittent service only.
2 Pumps operating in excess of 15000 psi require special gauge and discharge flanges. Contact a local Weir representative for information.
3 Cells highlighted in blue are intermediate zones where erosion is more prevalent when 3" iron is used (MAX 778GPM)
4 Cells highlighted in orange are intermediate zones where erosion is more prevalent when 4" iron is used (MAX1446GPM when fluid end bridle is used).

SPM® Destiny® QWS 2800 Pump - Brake Horsepower Curve

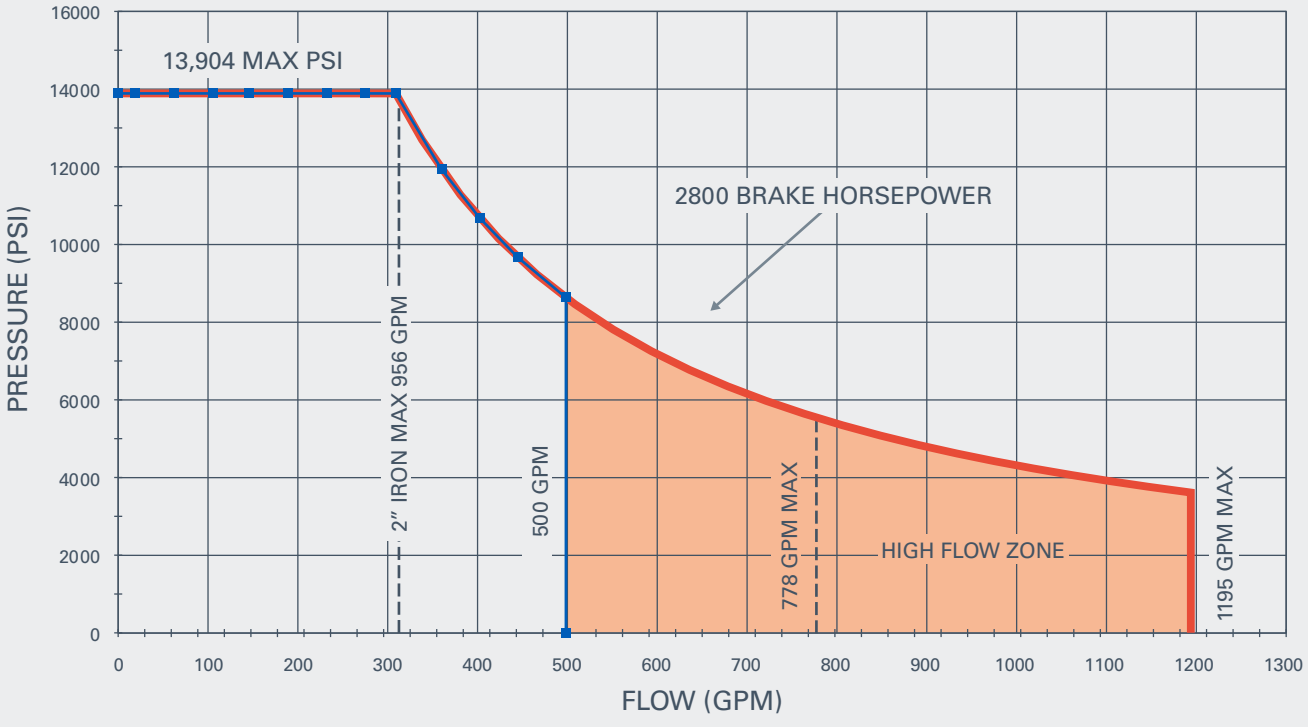
SPM® Destiny® QWS 2800 Pump - 4.00" Plunger Horsepower Curve



SPM® Destiny® QWS 2800 Pump - 4.50" Plunger Horsepower Curve



SPM® Destiny® QWS 2800 Pump - 5.00" Plunger Horsepower Curve



SPM® Duralast® Fluid Ends

Technology Proven to Reduce Your Operational Expense

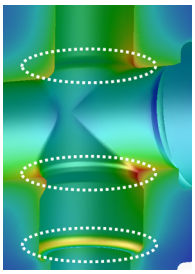
Everything about the patented SPM® Duralast™ fluid end technology is unconventional. The combination of optimized geometry, improved manufacturing processes and alternative materials are proven to double the life of conventional fluid ends currently on the market.

SPM® Duralast™ technology was engineered to address the challenges of drilling deeper, horizontally and in harsher environments. This innovative technology helps to lower operational costs and increase productivity improving fatigue life by more than 50 percent and reducing stress concentrations by more than 30 percent*.

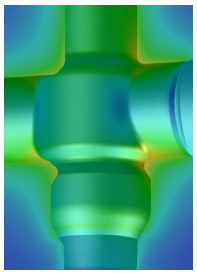
30%
REDUCTION IN STRESS CONCENTRATIONS*

DESIGN ADVANCEMENTS

SPM® Duralast™ technology addresses the three fundamental root causes of fluid end failure: cracking in the cross bores, cracking in the valve seat deck and corrosion pitting.



Conventional technology causes higher stress in critical areas



Duralast™ technology lowers stress up to 30 percent in critical areas

Cross bores cracking – offset suction and discharge bores reduce stress valve seat deck cracking – a new angled valve seat integrates with the fluid end to reduce stress loads

Corrosion pitting – proprietary stainless steel resists corrosion and works with the technology to deliver greater than 5x the life of conventional SPM® fluid ends

Field tested and proven in the harshest environments, SPM® Duralast™ fluid end technology is designed to be one of the longest lasting fluid ends of its type on the market. Its features are transferable to any fluid end size or pump type.

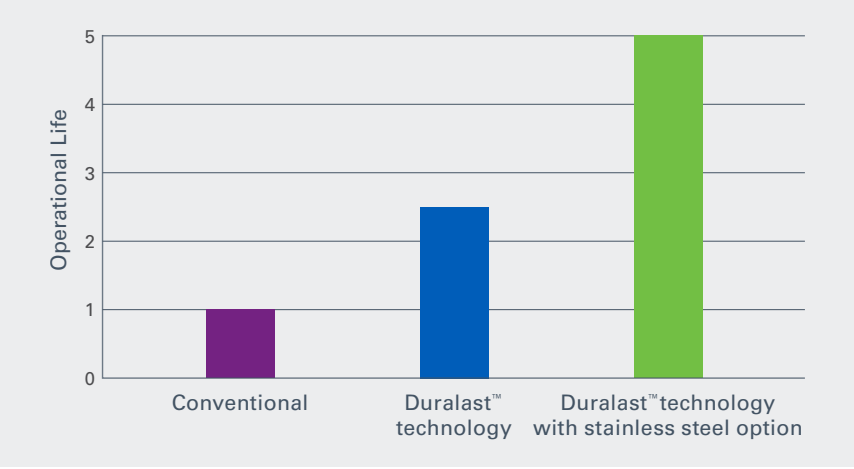
50%
FATIGUE LIFE IMPROVEMENT*

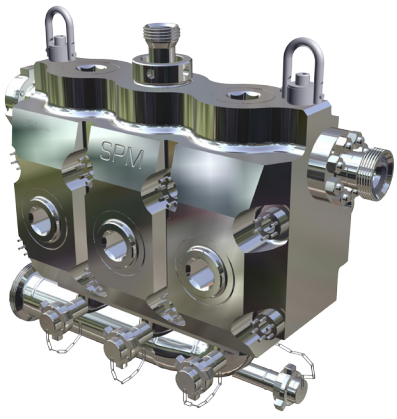
AVAILABLE OPTIONS

- Stainless steel or carbon steel
- Suction manifold
- Gauge port discharge
- Discharge flange configurations

GREATER THAN
5x
THE LIFE OF CONVENTIONAL SPM® FLUID ENDS*

SPM® DESTINY® FRAC PUMP WITH DURALAST™ VS. CONVENTIONAL SPM® FLUID ENDS





SPM® Duralast™ fluid end with stainless steel option

* When compared to conventional SPM® fluid ends that do not feature SPM® Duralast™ technology.

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