

TECHNICAL HANDBOOK

Heavy Duty Slurry Pump

EMW[®]



WILFLEY[®]



Uses Wilfley
Sealing Technology

WILFLEY SEALING TECHNOLOGY



Wilfley invented the Dynamic Expeller Seal almost a century ago and has continued to lead advancements in pump sealing technologies ever since.

The combination of the Wilfley Dynamic Expeller Seal (pump running) and the SolidLock™ Static Seal (pump off) provides **leak free** operation at all times.

The harmony between the dynamic and static seal is what makes Wilfley Sealing Technology excel beyond conventional seals.



C
1918



K
1950



HD
1984

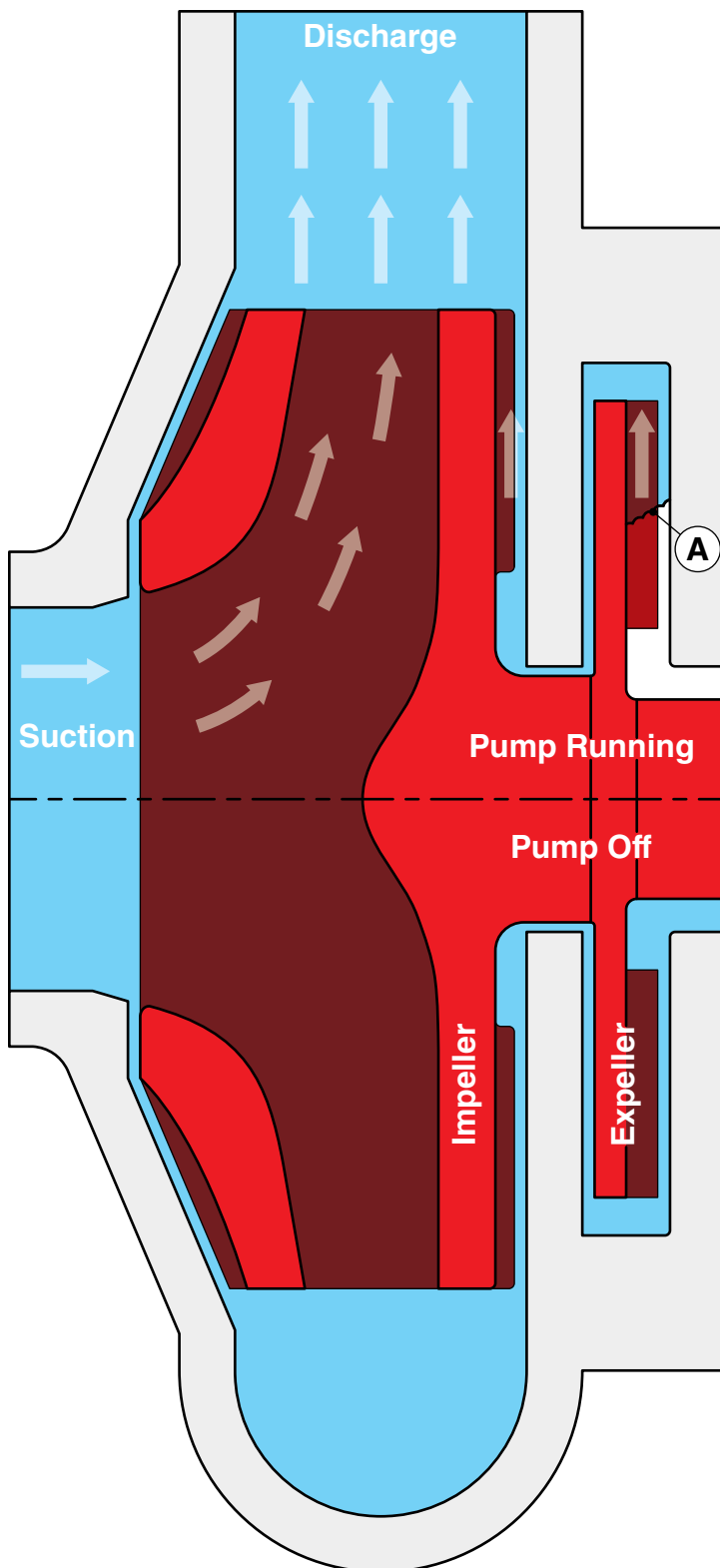


KPRO®
2011



EMW®
2013

WILFLEY DYNAMIC EXPELLER SEAL



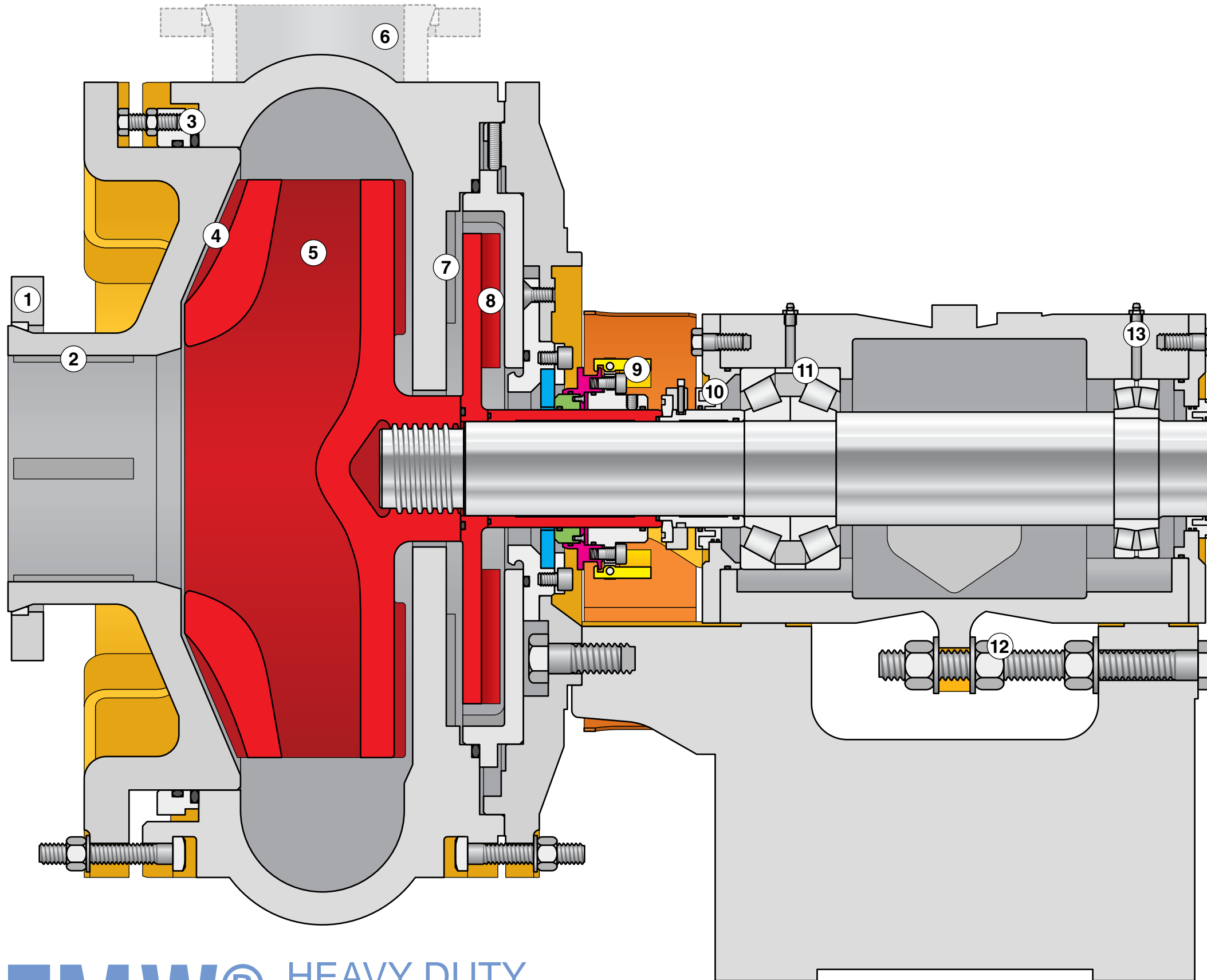
FEATURES & BENEFITS:

- A superior alternative to packing / mechanical seals and associated flush systems
- Excellent solids / slurry handling capabilities
- Operational abuse tolerant, e.g. cavitation and vibration
- Dry running capability
- Product dilution is eliminated
- Reduces maintenance costs and maximizes production time through increased mean time between maintenance (MTBM)

HOW THE WILFLEY DYNAMIC EXPELLER SEAL WORKS:

- A liquid interface **(A)** is established during pump operation by centrifugal forces generated by the expeller
- This liquid interface effectively isolates the pumped fluid from the shaft
- A variety of proprietary static seals prevent any leakage when the pump isn't in operation

EMW® SLURRY PUMP FEATURES & BENEFITS



WET END

- 1 ASME/ANSI and ISO/DIN flanges available*
- 2 Flow straightening vanes minimize turbulence, extend wear life, and improve performance
- 3 Adjustable suction cover to optimize efficiency and minimize wear (larger sizes only)*
- 4 Front and rear impeller vanes reduce wear
- 5 Optimized hydraulics for high efficiency, low NPSHr, and low wear
- 6 Tangential discharge improves efficiency and reduces wear
- 7 Static vanes reduce wear

WILFLEY SEALING TECHNOLOGY

- 8 Large expeller provides superior dynamic sealing with zero operational leakage
- 9 SolidLock™ static seal engineered for reliable sealing

Other sealing options available including packing and mechanical seals

POWER END

- 10 Labyrinth seals to protect internal components during wash-down cycles
- 11 Over-sized, self aligning tapered roller bearings for trouble free operation
- 12 Easy clearance adjustment to maintain efficiency and optimize hydraulic and/or expeller performance
- 13 Grease lubricated power end

Oil lubricated power end optional

Distortion free bearing clamp system ensures maximum bearing life (see page 10)

*Available on metallic wet end only

EMW® HEAVY DUTY
CLASS 3 & 4
SLURRY PUMP

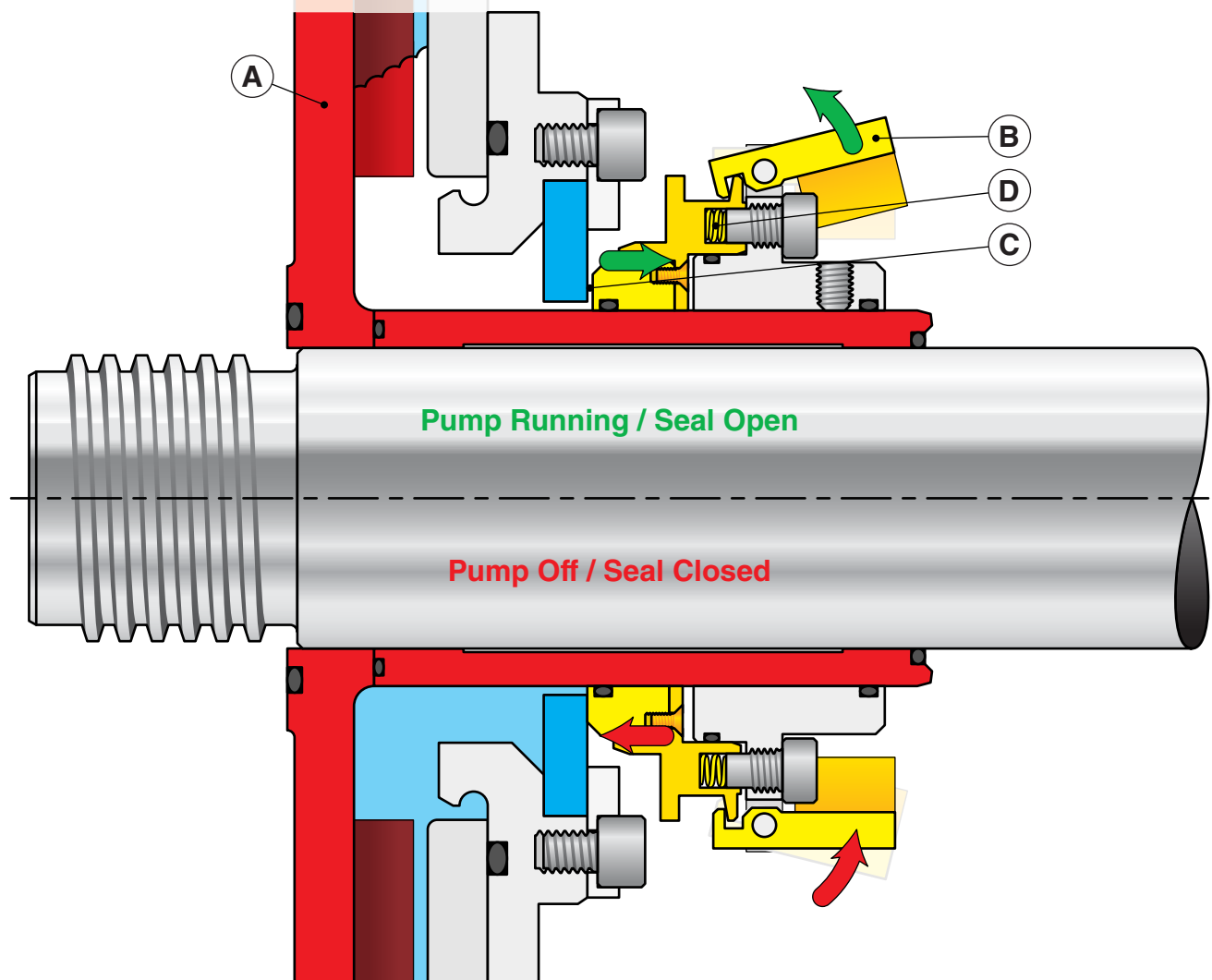
WILFLEY SOLIDLOCK™ STATIC SEAL



HOW THE SOLIDLOCK™ SEAL WORKS:

At start up, the expeller (A) establishes a liquid interface that pulls the pumped fluid away from the seal faces. As this happens, centrifugal force moves weights (B) outwards to open seal faces (C) and prevents any rubbing contact.

At shut down, the liquid interface collapses and the pumped fluid is pushed towards the seal faces. Isolated springs (D) force the seal faces to close before any of the pump fluid can escape.

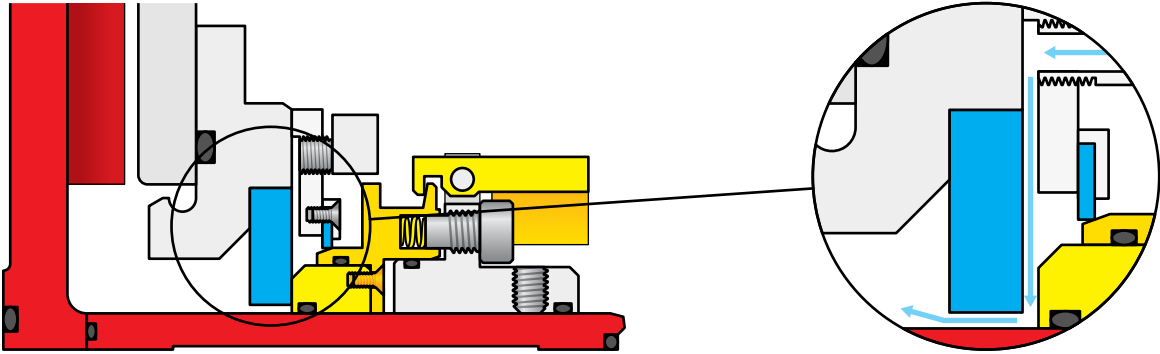


FEATURES & BENEFITS:

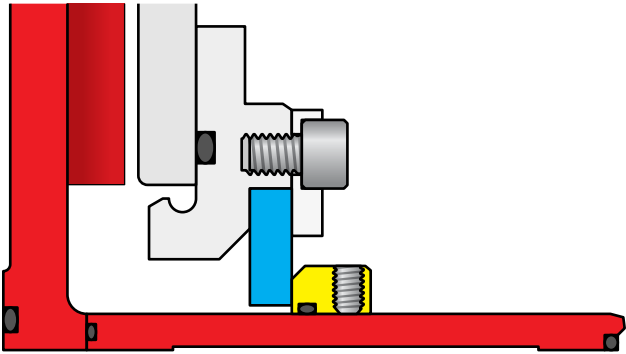
- **Leak free operation** - Precise and controlled seal face opening
- **Reliable and repeatable seal actuation** - The spring force is specifically set for your application and can be easily adjusted in the field if necessary
- **Easy to install / maintain** - Simple and effective design, no special tools needed

EMW[®] SLURRY PUMP SEALING OPTIONS

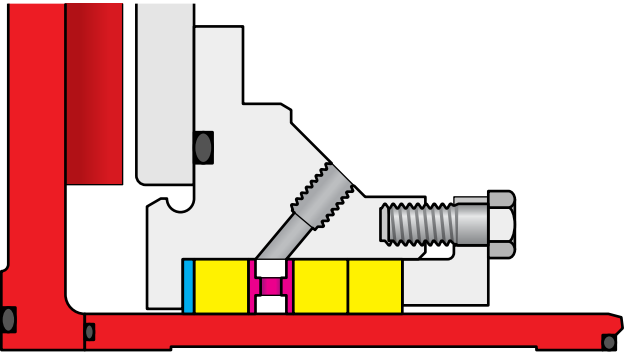
The EMW[®] pump has been designed to accommodate a wide variety of sealing options to specifically suit your application.



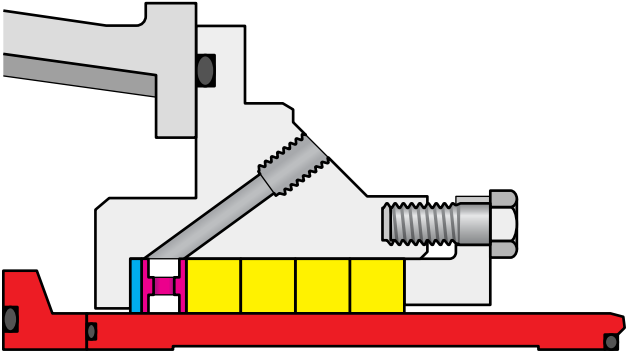
SolidLock™ with Flush Option
(Start up / Shut down)



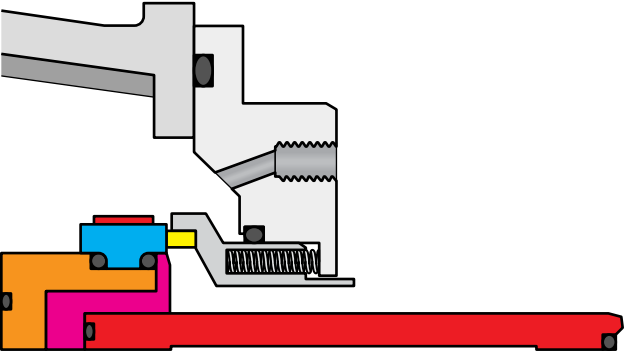
SolidLock™ Lite
(Diaphragm Seal with Expeller)



Expeller with Packing
(Weep Configuration Shown)

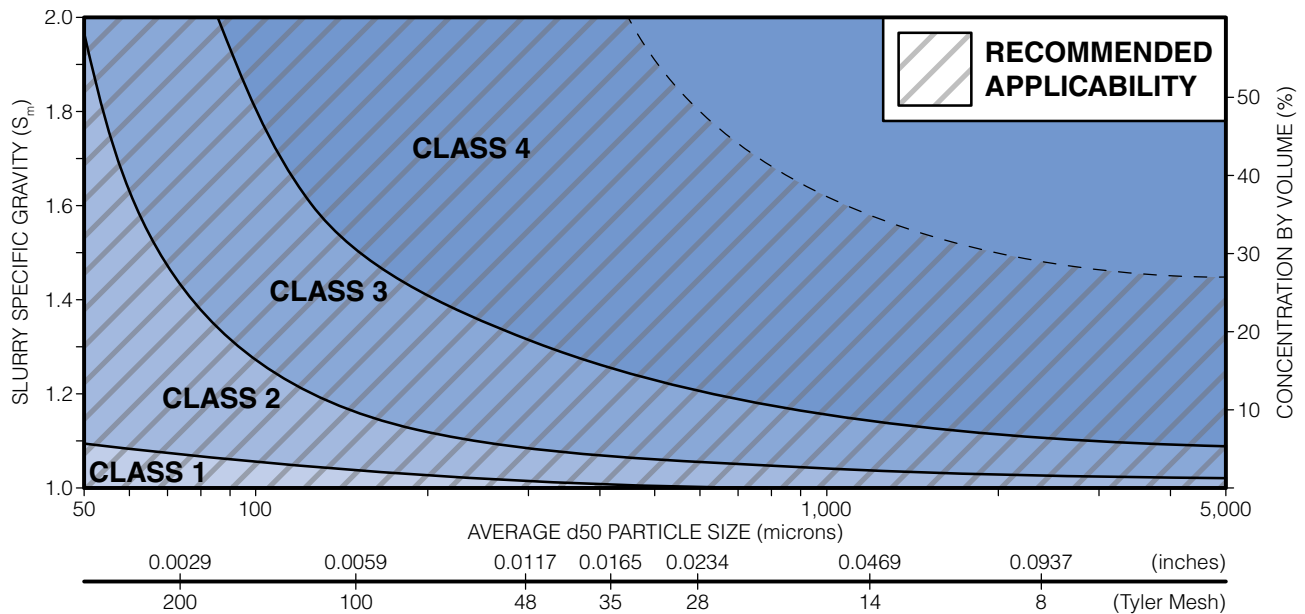


Packing
(Flush Configuration Shown)



Single / Double Mechanical Seals

DESIGNED FOR CLASS 3 & 4 SLURRY SERVICES



For use as a first guide only, assumes 2.65 s_{sol} silica-based solids. Adjust rating to account for solids of different abrasivity using ASTM G75-95.

Courtesy of Hydraulic Institute, Parsippany, NJ www.pumps.org

ROBUST CONSTRUCTION

The wet end construction of the EMW[®] pump is built to last and features components with double the thickness of comparable medium duty slurry pumps. This type of design, combined with Wilfley's proprietary MAXALLOY[®] 5A hard iron and rubber liners, creates the ideal slurry pump for high wear applications.

21ST CENTURY HYDRAULICS

Wilfley used the latest computational fluid dynamics software to determine the optimal balance between hydraulic performance and wear life. This design was then validated with extensive empirical testing in the field.

BREAKTHROUGH MATERIALS

Wilfley and its wholly owned subsidiary, Western Foundries, provide a variety of metals and proprietary processes for the longest possible pump and parts life and reliability.

WILFLEY KNOWS METALLURGY

This partnership also allows Wilfley to provide very competitive lead times for both complete pumps and spare parts.

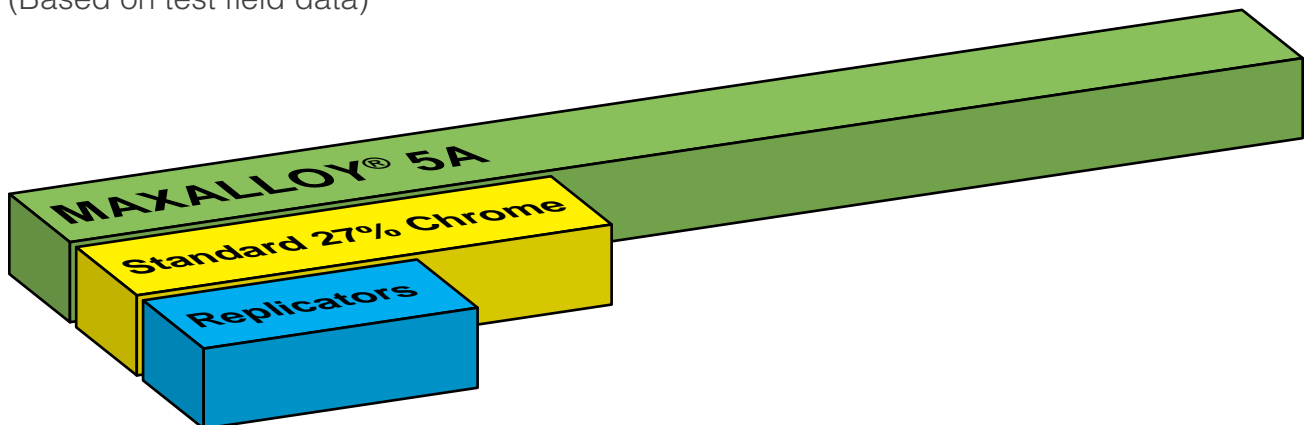
MAXALLOY® 5A

Wilfley's proprietary MAXALLOY® 5A was developed specifically for the toughest slurry applications, combining unsurpassed hardness for wear resistance with superior toughness for durability.

Through special proprietary processing, chromium carbides are evenly distributed in a fully martensitic matrix with an average hardness of **740 HBN**. The microstructure is designed to avoid any retained austenite, delta ferrite and secondary carbides resulting in extraordinary wear performance as compared to commonly available high chrome irons.

AVERAGE SERVICE LIFE

(Based on test field data)



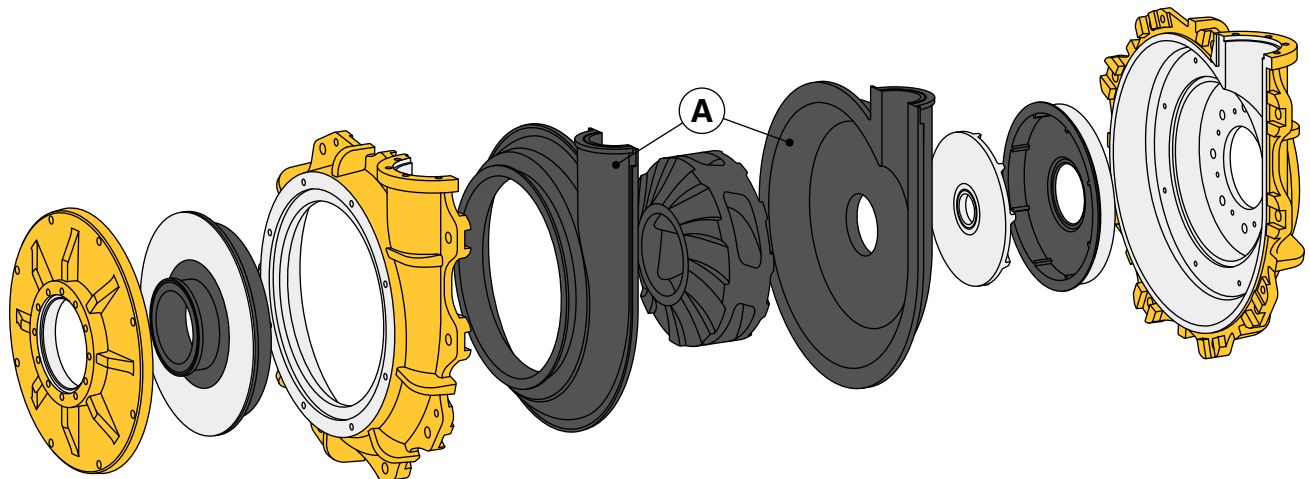
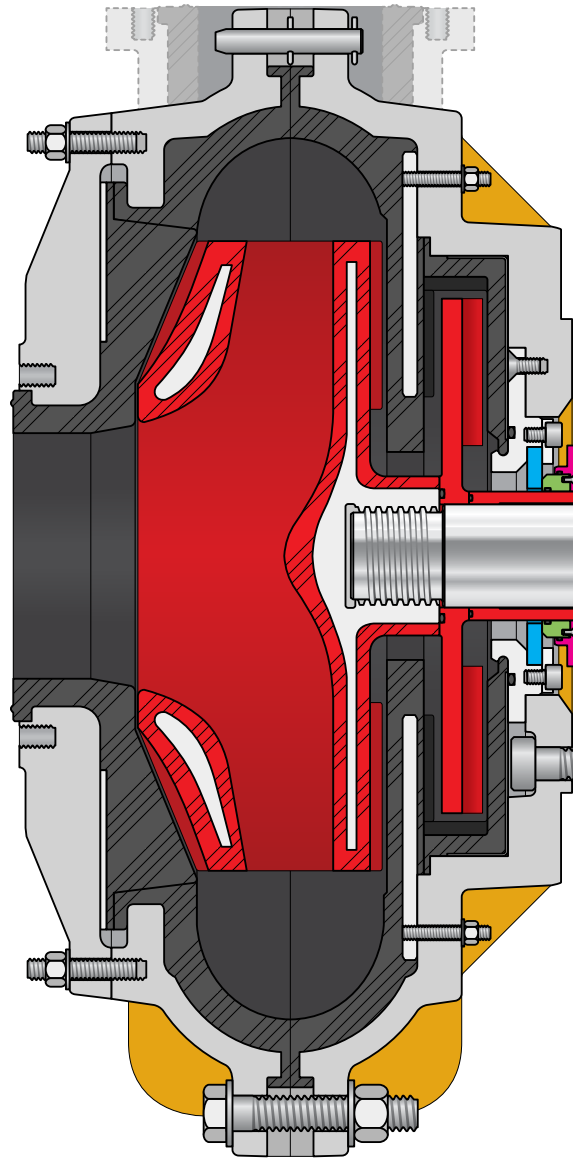
LINED WET END

THE EMW® PUMP IS ALSO AVAILABLE WITH RUBBER LINED WET END CONFIGURATIONS

- High wear resistance
- Chemically resistant
- Replaceable wear liners **(A)**
- Maintenance friendly split casing
- Uses the same robust power end as the metallic wet end
- Available with the same sealing options as the metallic wet end
- Other liner materials available upon request

APPLICABILITY

- Particle type: Spherical (non-sharp)
- Max Particle Size: 0.24 in (6 mm)
- Max Temperature: 180°F (80°C)
- Max Peripheral Speed: 5,500 ft/min (28 m/s)



EXTREME DUTY POWER END

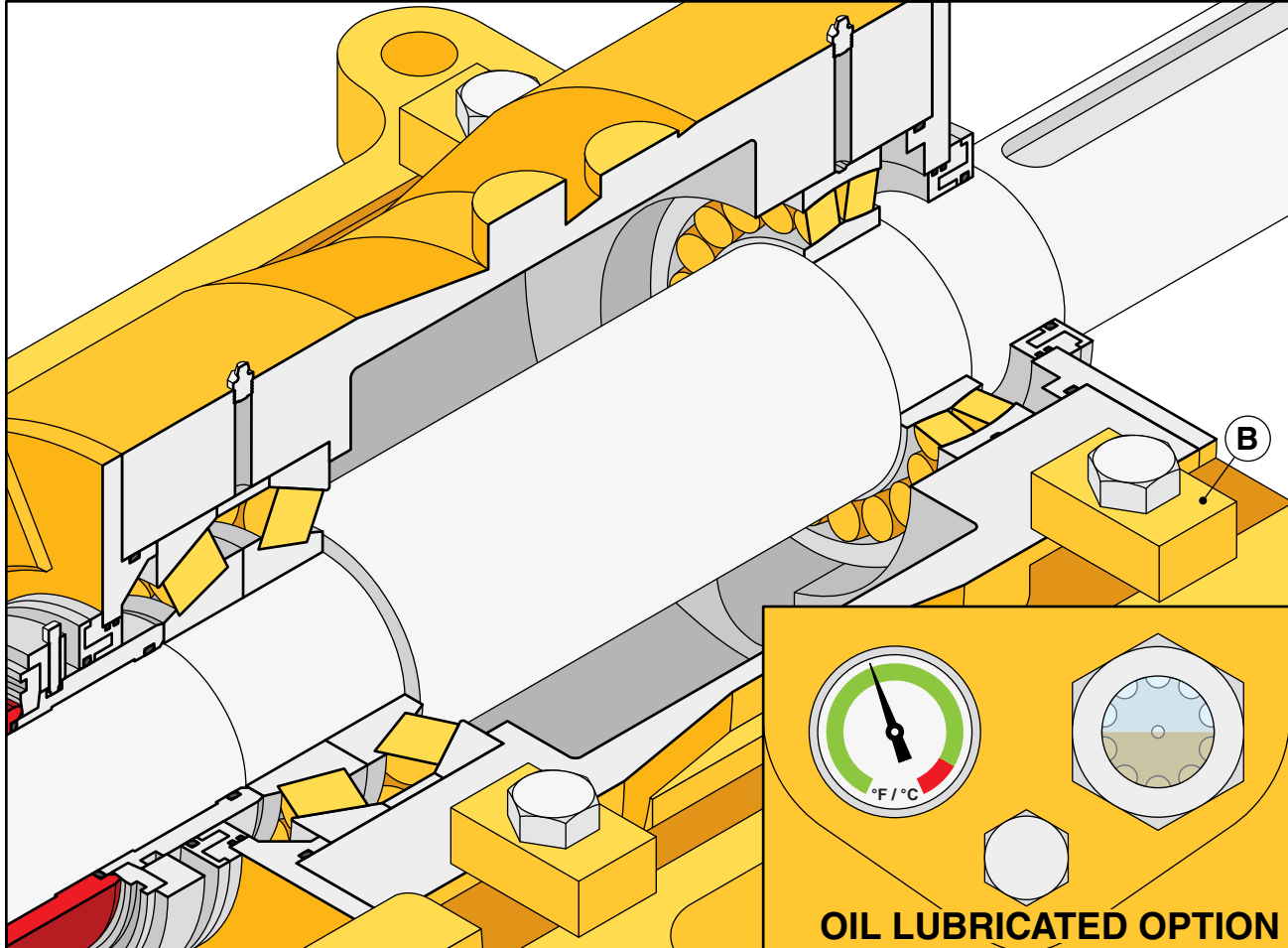
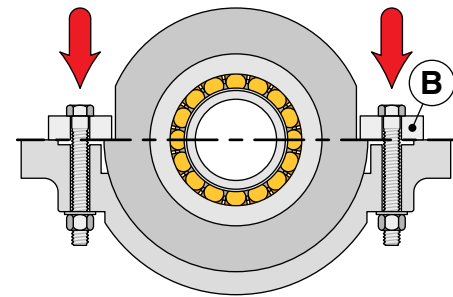
The power end of the EMW® pump has been engineered to handle the most difficult slurry applications. The power end can be configured for either grease or oil lubricated bearings.

LOW L^3/D^4 SHAFT STIFFNESS RATIOS

EMW 50 2x2	EMW 75 3x3	EMW 100 4x3	EMW 150 6x4	EMW 200 8x6	EMW 250 10x8
8.9	5.1	3.2	1.6	1.5	1.5

DISTORTION FREE BEARING CLAMP SYSTEM

The bearing cartridge is held in place with specially designed clamps (B), which eliminate hoop stress on the bearings and provide distortion free operation.

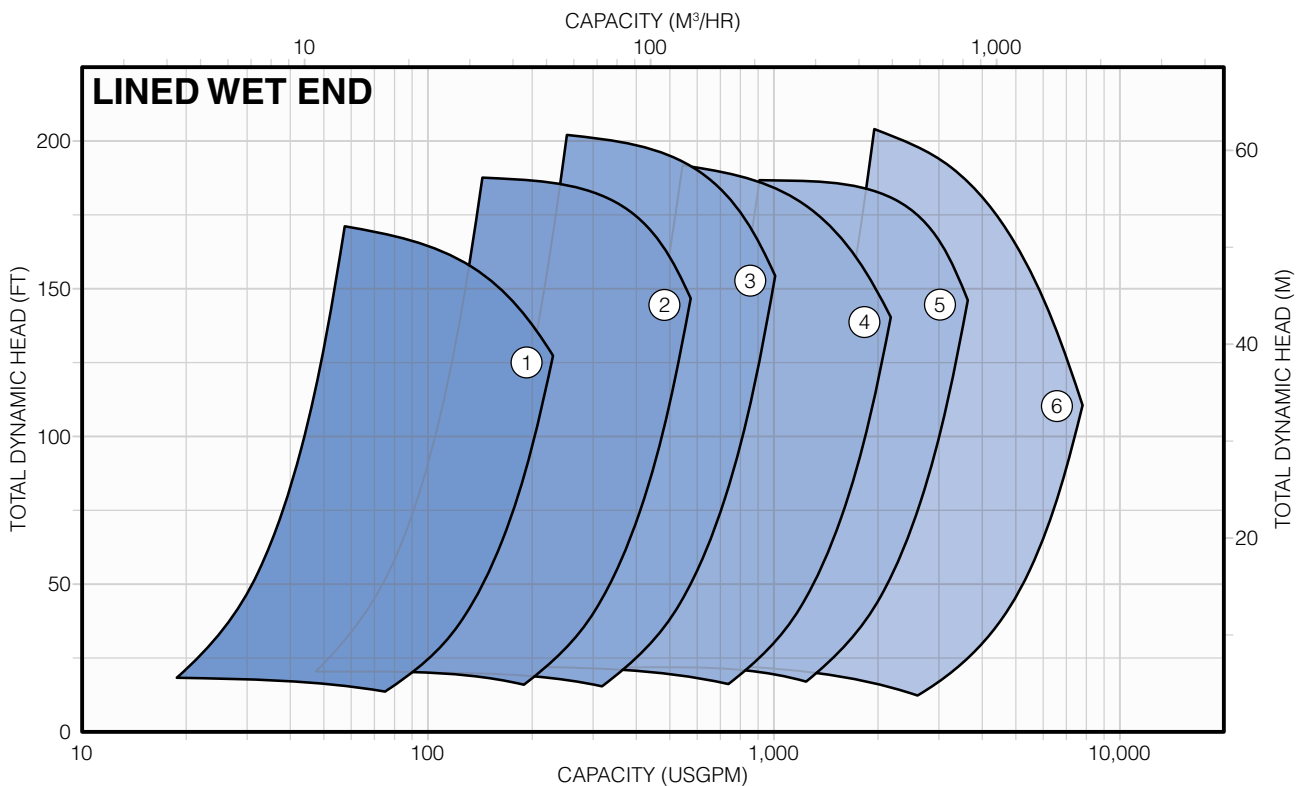
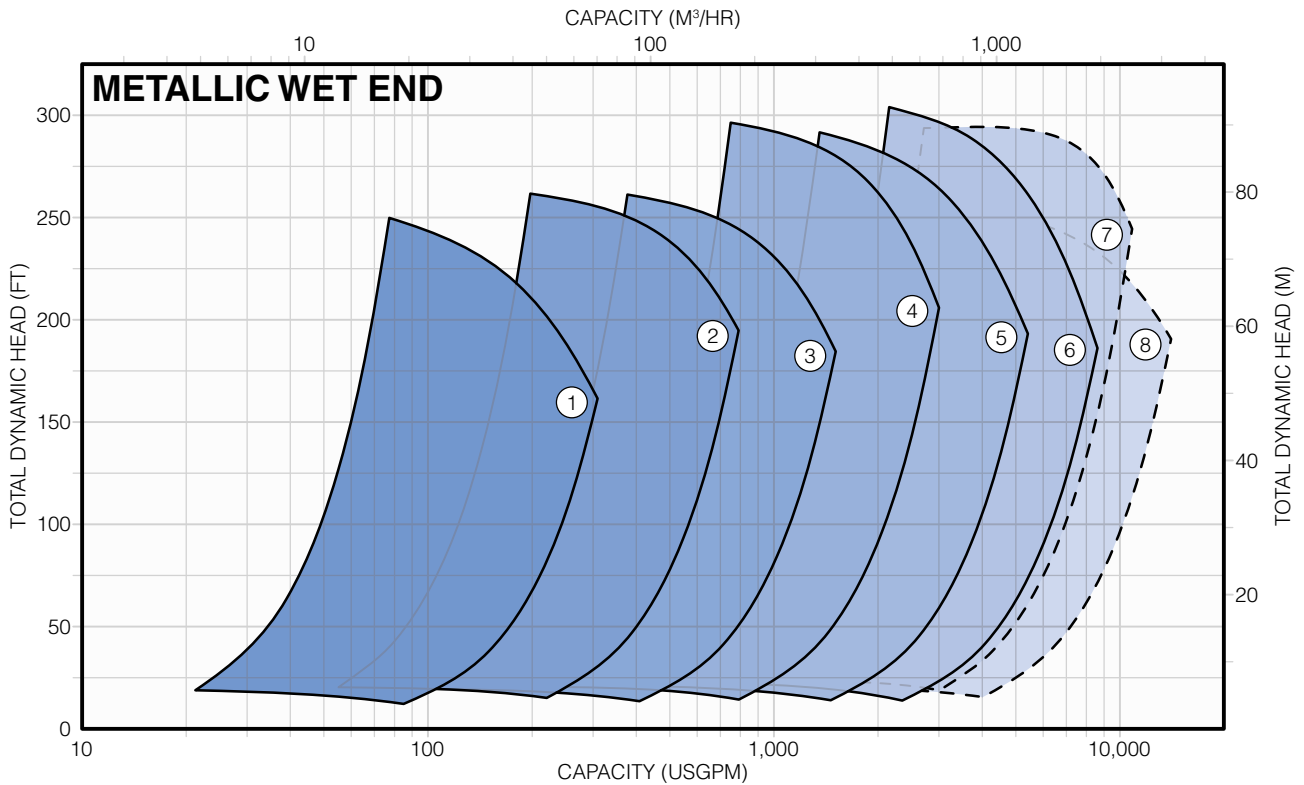


CONSTRUCTION DETAILS

		METALLIC WET END					
		EMW 50 2x2	EMW 75 3x3	EMW 100 4x3	EMW 150 6x4	EMW 200 8x6	EMW 250 10x8
GENERAL							
Bare Pump Weight	lbs	360	485	590	1,165	2,345	3,445
	kg	163	220	268	528	1064	1563
Max Passable Solids Size	in	0.71	0.79	1.57	1.97	2.36	2.76
	mm	18	20	40	50	60	70
SHAFT							
Diameter at Impeller	in	1.11	1.22	1.57	2.13	2.72	3.11
	mm	28	31	40	54	69	79
Diameter at Coupling	in	1.30	1.77	2.17	2.56	3.15	3.54
	mm	33	45	55	65	80	90
BEARINGS							
Radial		22207	22210	22212	22215	22218	22220
Thrust		31307	31309	31311	31314	31317	31319

		LINED WET END					
		EMW 50 2x2	EMW 75 3x3	EMW 100 4x3	EMW 150 6x4	EMW 200 8x6	EMW 250 10x8
GENERAL							
Bare Pump Weight	lbs	310	430	615	1,095	1,930	3,485
	kg	141	195	279	497	875	1,581
Max Passable Solids Size	in	0.71	0.79	1.18	1.57	2.36	2.76
	mm	18	20	30	40	60	70
SHAFT							
Diameter at Impeller	in	1.11	1.22	1.57	2.13	2.72	3.11
	mm	28	31	40	54	69	79
Diameter at Coupling	in	1.30	1.77	2.17	2.56	3.15	3.54
	mm	33	45	55	65	80	90
BEARINGS							
Radial		22207	22210	22212	22215	22218	22220
Thrust		31307	31309	31311	31314	31317	31319

EMW[®] SLURRY PUMP CAPACITIES



- 1. EMW 50
2x2
- 2. EMW 75
3x3
- 3. EMW 100
4x3
- 4. EMW 150
6x4
- 5. EMW 200
8x6
- 6. EMW 250
10x8
- 7. EMW 300
12x10*
- 8. EMW 350
14x12*

*Contact Wilfley for availability

DIMENSIONS

PUMP DIMENSIONS

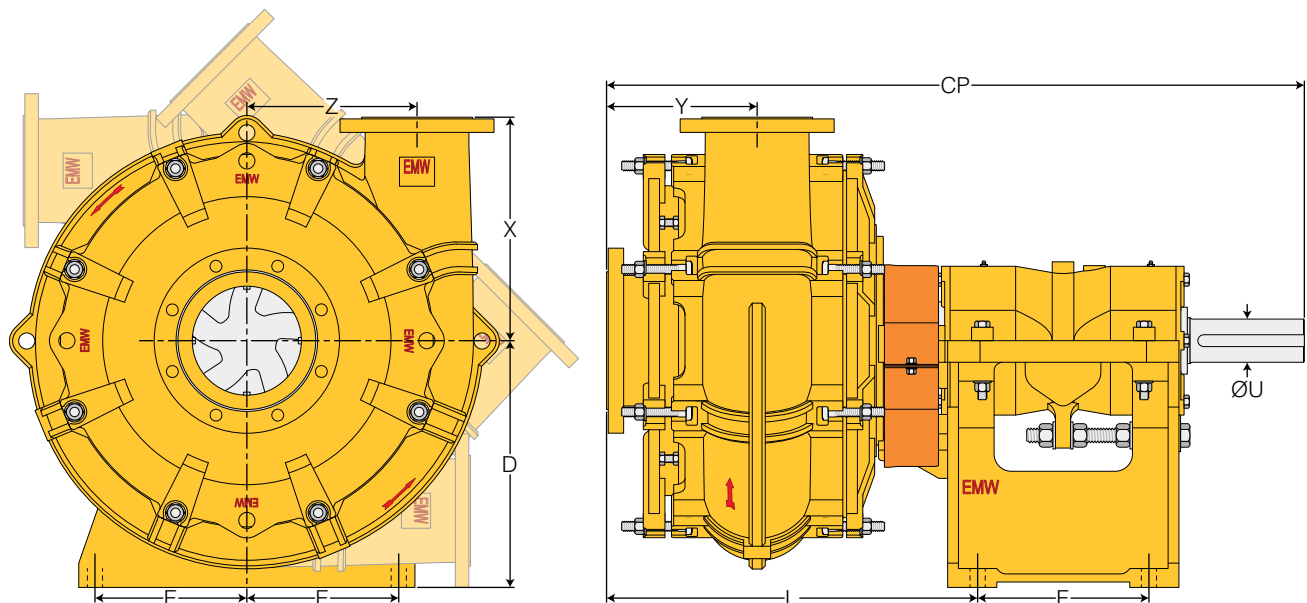
Inches (Millimeters)

Pump Size	Suction Flange	Discharge Flange	CP	D	E	F	L	U	X	Y	Z	KEYWAY
METALLIC WET END												
EMW 50 2x2	2 (50)	2 (50)	27 (684)	10 (254)	6.4 (161)	7.8 (197)	13.2 (335)	1.3 (33)	8.5 (215)	4.5 (114)	4.9 (123)	0.4 x 0.4 (10 x 8)
EMW 75 3x3	3 (75)	3 (75)	30.3 (769)	10 (254)	6.4 (161)	7.8 (197)	16 (404)	1.8 (45)	8.3 (209)	6 (152)	6.3 (160)	0.6 x 0.4 (14 x 9)
EMW 100 4x3	4 (100)	3 (75)	33 (837)	10 (254)	6.9 (173)	8.5 (215)	18 (457)	2.2 (55)	10.1 (255)	6.9 (173)	6.8 (172)	0.7 x 0.4 (16 x 10)
EMW 150 6x4	6 (150)	4 (100)	39.6 (1004)	13.2 (335)	8.3 (210)	9 (227)	21.8 (553)	2.6 (65)	13.3 (336)	9.1 (230)	9.6 (242)	0.8 x 0.5 (18 x 11)
EMW 200 8x6	8 (200)	6 (150)	50.9 (1291)	18 (457)	11.1 (281)	12.5 (316)	27.1 (687)	3.2 (80)	16.3 (414)	11 (278)	12.5 (315)	0.9 x 0.6 (22 x 14)
EMW 250 10x8	10 (250)	8 (200)	67.6 (1715)	24.1 (610)	17.9 (454)	21.6 (548)	31.3 (793)	3.6 (90)	19.1 (484)	12.3 (310)	14.9 (378)	1 x 0.6 (25 x 14)
LINED WET END												
EMW 50 2x2	2 (50)	2 (50)	26.7 (678)	10 (254)	6.4 (161)	7.8 (197)	12.7 (321)	1.3 (33)	6.9 (175)	3.6 (90)	4.9 (123)	0.4 x 0.4 (10 x 8)
EMW 75 3x3	3 (75)	3 (75)	29.2 (740)	10 (254)	6.4 (161)	7.8 (197)	14.4 (365)	1.8 (45)	8.5 (215)	4.8 (121)	6.3 (160)	0.6 x 0.4 (14 x 9)
EMW 100 4x3	4 (100)	3 (75)	32.5 (825)	10 (254)	6.9 (173)	8.5 (215)	17.2 (435)	2.2 (55)	11.2 (283)	5.8 (145)	6.8 (172)	0.7 x 0.4 (16 x 10)
EMW 150 6x4	6 (150)	4 (100)	38.5 (976)	13.2 (335)	8.3 (210)	9 (227)	20.7 (525)	2.6 (65)	14.1 (358)	7.1 (178)	9.6 (242)	0.8 x 0.5 (18 x 11)
EMW 200 8x6	8 (200)	6 (150)	48.6 (1232)	18 (457)	11.1 (281)	12.5 (316)	24.4 (618)	3.2 (80)	17.4 (440)	8.8 (221)	12.5 (315)	0.9 x 0.6 (22 x 14)
EMW 250 10x8	10 (250)	8 (200)	65.5 (1663)	24.1 (610)	17.9 (454)	21.6 (548)	29.2 (740)	3.6 (90)	20.1 (510)	10.4 (263)	14.9 (378)	1 x 0.6 (25 x 14)

These dimensions are not for construction. Certified dimension prints are available for your specific installation

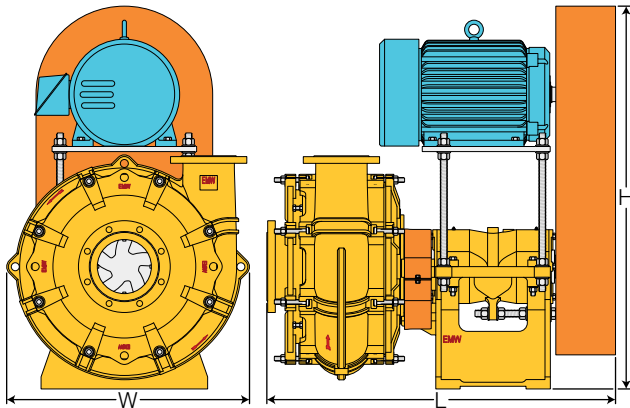
ASME/ANSI and ISO/DIN flanges available.

The discharge can rotate in 45° increments to specifically meet your needs.



DRIVE CONFIGURATIONS

INLINE OVERHEAD (Small Motors)

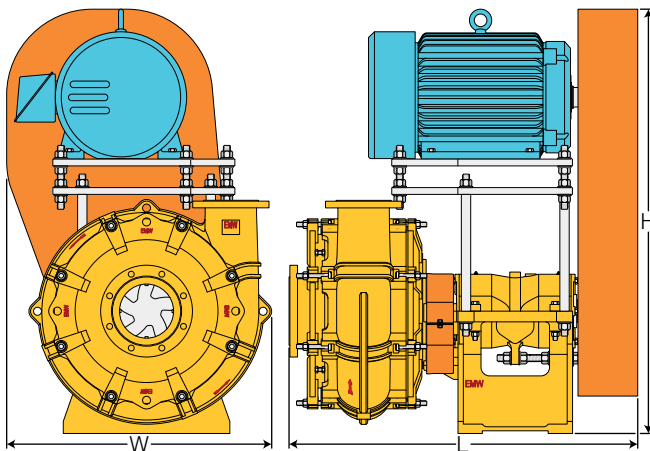


Approximate Dimensions

Inches (Millimeters)
NEMA (IEC)

Pump Size	Motor Range	L	W	H
EMW 50 2x2	143T-213T (90S-112M)	30 (755)	21 (510)	41 (1032)
EMW 75 3x3	143T-213T (90S-112M)	33 (824)	21 (510)	41 (1032)
EMW 100 4x3	143T-215T (90S-112M)	36 (895)	21 (510)	41 (1032)
EMW 150 6x4	143T-256T (90S-132M)	46 (1159)	29 (715)	64 (1605)
EMW 200 8x6	256T-326T (160S-200L)	55 (1386)	36 (907)	68 (1724)
EMW 250 10x8	286T-405T (180S-280M)	68 (1722)	43 (1069)	75 (1885)

OFFSET OVERHEAD (Medium Motors)

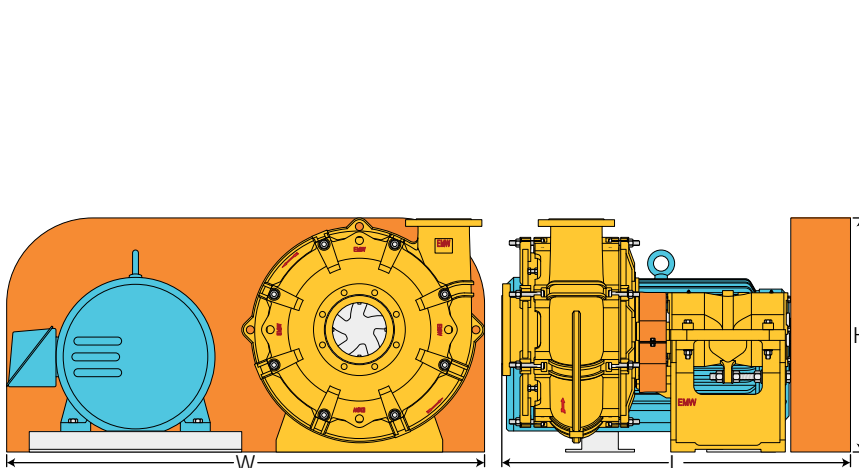


Approximate Dimensions

Inches (Millimeters)
NEMA (IEC)

Pump Size	Motor Range	L	W	H
EMW 50 2x2	215T-405T (132S-250M)	34 (850)	32 (794)	52 (1313)
EMW 75 3x3	215T-405T (132S-250M)	35 (875)	32 (794)	52 (1313)
EMW 100 4x3	254T-405T (160M-250M)	38 (945)	32 (794)	52 (1313)
EMW 150 6x4	284T-405T (160M-250M)	44 (1104)	35 (884)	64 (1613)
EMW 200 8x6	364T-405T (225S-250M)	53 (1332)	39 (990)	69 (1735)
EMW 250 10x8	All overhead configurations are inline			

SIDE BY SIDE (Large Motors)



Approximate Dimensions

Inches (Millimeters)
NEMA (IEC)

Pump Size	Motor Range	L	W	H
EMW 50 2x2	All belt driven configurations are overhead			
EMW 75 3x3	All belt driven configurations are overhead			
EMW 100 4x3	444T-449T (280S-315M)	41 (1026)	69 (1730)	29 (735)
EMW 150 6x4	444T-449T (280S-315M)	46 (1151)	75 (1880)	29 (735)
EMW 200 8x6	444T-586T (280S-355L)	60 (1504)	84 (2130)	35 (871)
EMW 250 10x8	444T-589T (315S-400L)	73 (1832)	90 (2280)	44 (1094)

Direct drive configurations are also available, contact Wilfley for more information

VISIT WWW.WILFLEY.COM

to see our full range of pumping solutions



A9 Process Pump



Kpro® Slurry Pump

WILFLEY®

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