




PCM

Artificial Lift Solutions

PROGRESSING CAVITY PUMP SYSTEMS

# Products & Services

keep it moving 



## PROGRESSING CAVITY PUMP

### WHAT IS A PCP

#### Principle

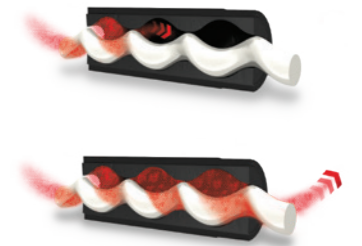
The Moineau pump consists of a single helical steel rotor turning inside a dual helical stator moulded in elastomer. When the rotor turns inside the stator a double chain of watertight cavities is created and fluid is transferred from the pump intake to the pump discharge without shearing the fluid.

#### Easy production optimization

The PCP volumetric technology allows easy adjustment of production with rotational speed. With a variable speed drive, the same equipment can cover a wide range of production rates.

#### PCP unique features

The PCP design is ideal for handling a wide range of viscosities, sand laden fluids and free gas. The PCP volumetric, non pulsating and emulsion free system steadily handles fluctuating well dynamics, viscosities or free gas content.



### YOUR EVERYDAY PARTNER

PCM Artificial Lift Solutions is a leading provider of artificial lift systems, specialized in progressing cavity pump systems. With over 40 years in oil & gas, our goal is to be your trustable "everyday" supplier of choice. Our comprehensive products and services are well suited to clients' day to day operational needs. When more demanding well challenges are present, PCM's technologies can take you that extra step in well performance.

### PCM ELASTOMERS ARE THE BEST IN THE BUSINESS

PCM takes pride in our unique legacy of being the manufacturer founded in 1932 by the inventor of the PCP, Mr René Moineau.

PCM elastomers are engineered from years of experience analyzing onsite oil & gas field data and then rigorously validated with internal testing. Our proprietary formulations are all mixed and injected in-house in our ISO 9001 certified manufacturing site.

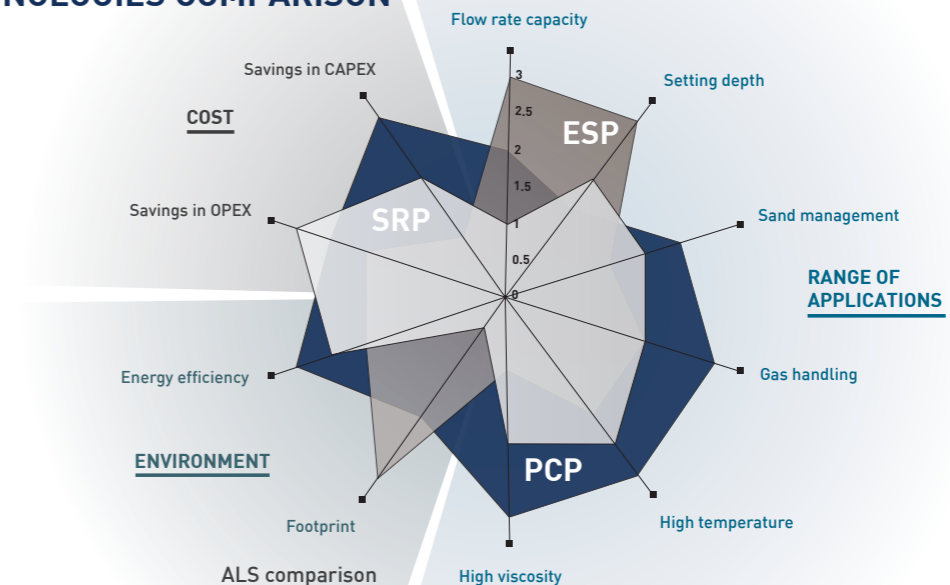
### PCM UNIQUE TECHNOLOGIES

As innovation is engraved in our DNA, PCM has never stopped innovating since its inception. We have elevated to the greatest level the panel of PCP technologies that have proven to unlock major challenges in ALS.



- PCM Vulcain™ the world's first All Metal PCP for ultra high temperature (SAGD, CSS)
- PCM Slugger the pump for gaseous well and multiphase applications
- PCM X-Bond the elastomer pump for mid-thermal market up to 150°C/300°F
- PCM Moineau™ Heavy Lift is a selection of PCP geometries dedicated to the harsh environment of viscous oil and solids production

### ALS TECHNOLOGIES COMPARISON



### PCP APPLICATIONS

#### Cold heavy oil and extra heavy oil

Cold production with or without sand was enabled by the deployment of the PCP. PCM 205 NBR and PCM 194 NBR are both soft elastomers pushing the limits of sand content in Heavy Oil. PCM 159 NBR is well recognized when there is little sand.

#### Medium to light oil

PCM 159 NBR is the most versatile choice for most conditions and PCM 204 FKM is the elastomer for high aromatics.

#### Thermal oil recovery

Cyclic Steam Stimulation (CSS), Steam Flood recovery and Steam Assisted Gravity Drainage (SAGD) are major areas for PCM Vulcain™ and PCM X-Bond when temperature is a limitation for conventional progressing cavity pumps.

Coal seam gas / coal bed methane PCM 205 NBR and PCM 159 NBR elastomers are proven performers when dewatering wells with varying salinity and solids content.

Where there is gas handling PCM Slugger is a game changing technology that can extend run life of any PCM Moineau™ PCP.

# PCM INNOVATION OVER THE YEARS



**1932**  
PCM was created and founded by René Moineau, the inventor of the PCP

**1972**  
PCM's first manufacturing plant was located in Paris, later moving to western France



**80's**  
Pioneering new Artificial Lift methods using PCPs started through several joint R&D projects in France

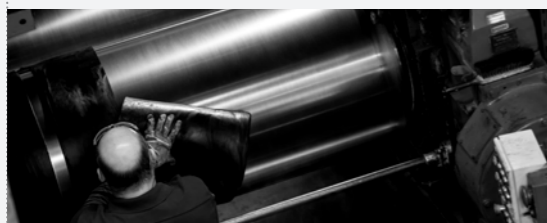
**1991**  
First commercial applications in heavy oil using PCPs began in Canada and in Venezuela

**90's**  
Engineering longer pumps, higher head capacity and new elastomer formulations specifically for O&G applications. New manufacturing methods and machines were needed to suit these new specifications

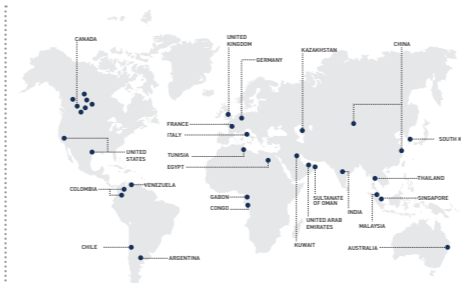
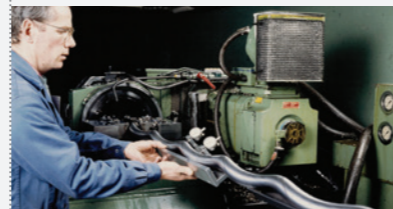


The Progressing Cavity Pump was initially intended to be a compressor to boost airplane engines, **but it turned out to be an outstanding pumping solution!**

**1984**  
PCM developed its own ALS elastomers, the core of PCP technology, resulting in the evolution of 159NBR, 205NBR, 194NBR, 198HNBR and 204FKM elastomers for heavy oil, CHOPS, medium oil, light oil and gas well dewatering (CSG and CBM) applications



**1994**  
PCM application engineering team developed its unique rotor sizing methodology



**2002**  
PCM made the strategic decision to go direct to the customer, resulting today in 15 service centers worldwide and operating in over 30 countries

**2007**  
Keep it Moving became the brand logo

**PCM** | keep it moving

**2006**  
PCM has introduced on the market PCM Vulcain™, the world's first All Metal PCP to operate in thermal wells up to 350°C / 700°F

**2010**  
PCM Slugger, a patented PCP technology for gaseous wells featuring Hydraulic Regulators to increase run life of gaseous wells



**2012**  
PCM built a vertical pump for a Floating LNG offshore Australia, the world's biggest ship!

**2019**  
PCM acquisition brought rotor machining and wellhead manufacturing to Edmonton

**2018**  
PCM X-Bond to push the limits of elastomer high temperature applications



**2014**  
PCM A Series, API 676 specifically designed for O&G surface pumping

**2021**  
PCM Vulcain™ 400V world's largest downhole PCP, able to deliver up to 1 200 m3/d / 7 200 bpd

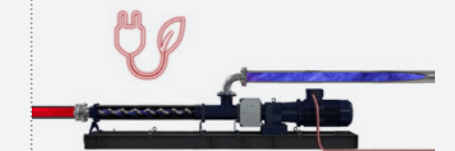


**2022**  
PCM Slugger ESPCP system. Using a permanent magnet motor downhole designed for PCP operation, this new generation of ESPCP is combined with PCM Slugger technology



**2024**  
PCM modernizes its ALS pump manufacturing process providing a significant reduction of its carbon footprint

**2023**  
PCM jointly with TOTALENERGIES, develops the first PCM Regenerative PowerPack, a patented multiphase turbine based on the Moineau principle to use available pressure to generate electricity. This can help users to meet their net-zero carbon objectives



# INDUSTRIAL EXCELLENCE

## ELASTOMER EXPERTISE

PCM has its own proprietary elastomer formulations and has operated its own elastomer mixing and injection facilities since its creation over 90 years ago. We are one of the few manufacturers who still produce their own elastomers. Elastomer production is rooted in the history of the Company and is one of our core competencies. We develop formulas in our state-of-the-art laboratory using decades of real world experience.

We capitalize on our unique in-house expertise to provide the best match for your fluids and applications.



## MAIN ELASTOMERS USED IN OIL & GAS APPLICATIONS



NBR	<b>PCM 159</b>	<b>NITRILE - "4-wheel drive"</b> Most versatile with its high ACN content, providing top performance across many applications
	<b>PCM 194</b>	<b>SOFT NITRILE</b> High resistance to abrasion and top performer for handling solids with varying water cuts
	<b>PCM 205</b>	<b>SOFT NITRILE</b> High resistance to abrasion and top performer for handling solids with varying water cuts
HNBR	<b>PCM 198</b>	<b>HYDROGENATED NITRILE</b> For higher temperature (150°C/300°F) applications and H <sub>2</sub> S&CO <sub>2</sub> resistance
	<b>PCM 206</b>	Extends the limits of 159
FKM	<b>PCM 204</b>	<b>FLUOROCARBON</b> Best performer for higher aromatics, and a good choice when nitriles are no longer effective

## SWELLING TEST

To select the most suitable elastomer, PCM performs swelling tests with oil samples from the field. For elastomer fine characterization with volatile fluids, we also propose our patented technology "In situ lab" allowing comparative and selective tests for most demanding applications. PCM's network of testing facilities is worldwide.



## PCM SLUGGER MULTIPHASE TECHNOLOGY

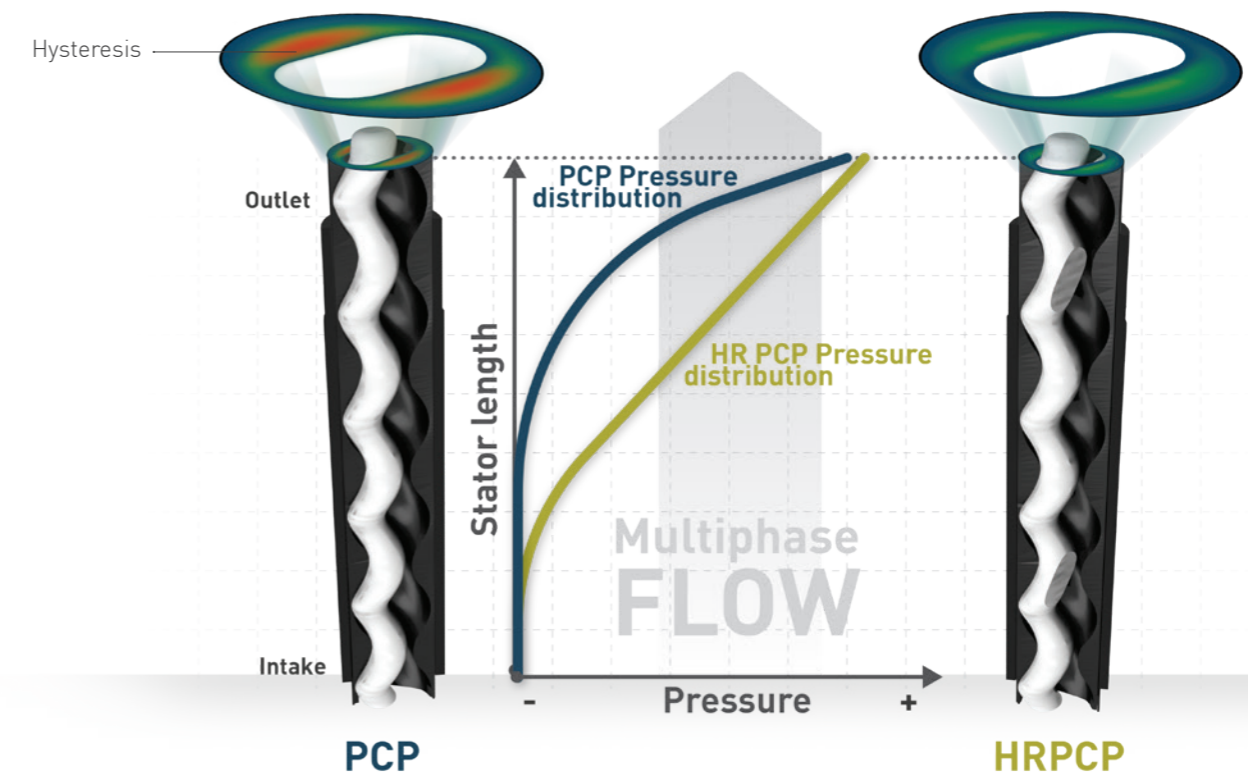


## HR PCP TECHNOLOGY FOR GAS MANAGEMENT

The PCM exclusive and patented hydraulically regulated PCP, PCM Slugger pushes the limits of the conventional progressing cavity pumps to handle the highest gas void fraction.

PCM Slugger is suitable in any gaseous wells including Coal Bed Methane (CBM) or Coal Seam Gas (CSG) dewatering wells; heavy oil or light oil wells.

The hydraulic regulators incorporated in the rotor design make PCM Slugger PCP (HRPCP) a versatile choice for variable and changing pumping conditions.



### Benefits

- Significantly improves pump run life compared to standard PCP in gaseous wells
- Interchangeable with any PCM standard rotor
- No downside when handling viscous fluid or high solids content

### Performance

- Pressure: up to 330 bar / 4 800 psi
- Flowrate: up to 570 m<sup>3</sup>/d (3 600 bfpd)
- GVF: up to 90% free gas continuous operation at pump intake and can accept higher fractions for short intervals



## PCM X-BOND

### HIGH TEMPERATURE ELASTOMER TECHNOLOGY



**PCM X-Bond** is a patented pump technology from PCM, which expands the application range for elastomeric PCPs in high temperature applications. **PCM X-Bond** provides optimal rotor / stator fit for maximum performance and run life in wells up to 150°C / 300°F.

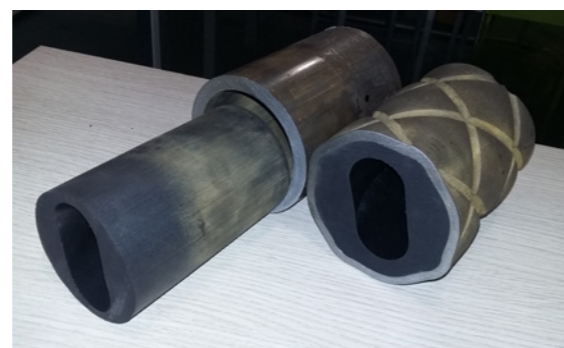
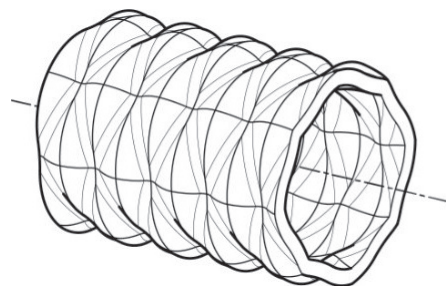
#### Features

- Stator shape provides “eXtreme-BONDing”
- Specifically engineered rotor profiles to address high temperature applications



#### CHALLENGES OVERCOME AT HIGH TEMPERATURES

When facing high temperature conditions, elastomers are prone to debonding. **PCM X-Bond** provides superior bonding, reducing the risk of such a mechanism to happen. Testing performed in the lab demonstrated the superior bonding of **PCM X-Bond** vs conventional PCP housing. Field feedback shows that the **PCM X-Bond** successfully pushed the envelope of run life in high temperature applications (CSS, Steamflood).



#### Benefits

- Strong elastomer bonding
- Expansion of temperature range in elastomeric PCP technology
- Also applicable for high CO2 content

#### Performance

- Pressure: up to 240 bar / 3 500 psi
- Flowrate: up to 570 m<sup>3</sup>/d (3 600 bfpd)
- Up to 150°C/300°F



## PCM VULCAIN™

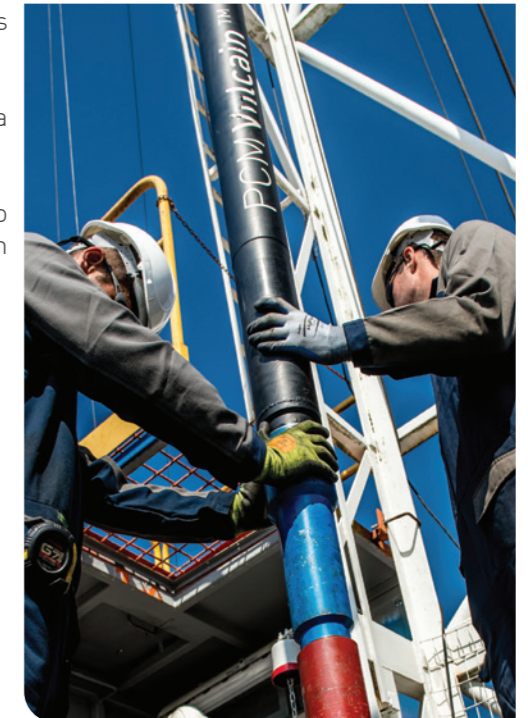
### ULTRA-HIGH TEMPERATURE TECHNOLOGY



**PCM patented All Metal PCP (AMPCP) technology**, PCM Vulcain™ extends the usual PCP temperature limit up to 350°C/660°F.

The PCM Vulcain™ features the same geometry and advantages as a conventional PCP with the elimination of the elastomer temperature limit.

PCM Vulcain™ is the only AMPCP having a track record of more than two decades in Steam Assisted Gravity Drainage (SAGD), Cyclic Steam Stimulation (CSS) and Steamflood applications.



The PCM Vulcain™ AMPCP technology is versatile in thermal applications.

In SAGD, PCM Vulcain™ is virtually unaffected by transient periods during warm-up or blowdown. It is ideally suitable for low-pressure production and associated low sub-cool conditions. In maturing SAGD fields, PCM Vulcain™ can handle fluctuations in steam and gas at the pump intake. PCM Vulcain™ is also tolerant to any solvent that may be used.

In CSS, PCM Vulcain™ enables steaming through the pump, longer production cycles and eliminates rod fall encountered by SRP.

In steamflood PCM Vulcain™ can manage the inflow coming from erratic heat front propagation or fluctuation from the steam facilities.

#### Benefits

- Through stator steaming avoids workover before and after steaming
- Tolerant to steam breakthrough with no steam lock
- Reliable in low sub-cool operations
- Compatible with solvents
- Can work across a wide wide range of viscosities (1-10 000+ cP) and temperatures with the same rotor

#### Performance

- Max. production flowrate: 7 250 bfpd / 1 150 m<sup>3</sup>/d
- Max. pressure: up to 160 bar / 2 300 psi
- Max. temperature: 350°C / 660°F



# PCM SLUGGER ESPCP

## ROD FREE PCP TECHNOLOGY

### WHY ESPCP

The Electrical Submersible PCP (ESPCP) combines the advantages of ESP downhole motor with the benefits of a PCP.

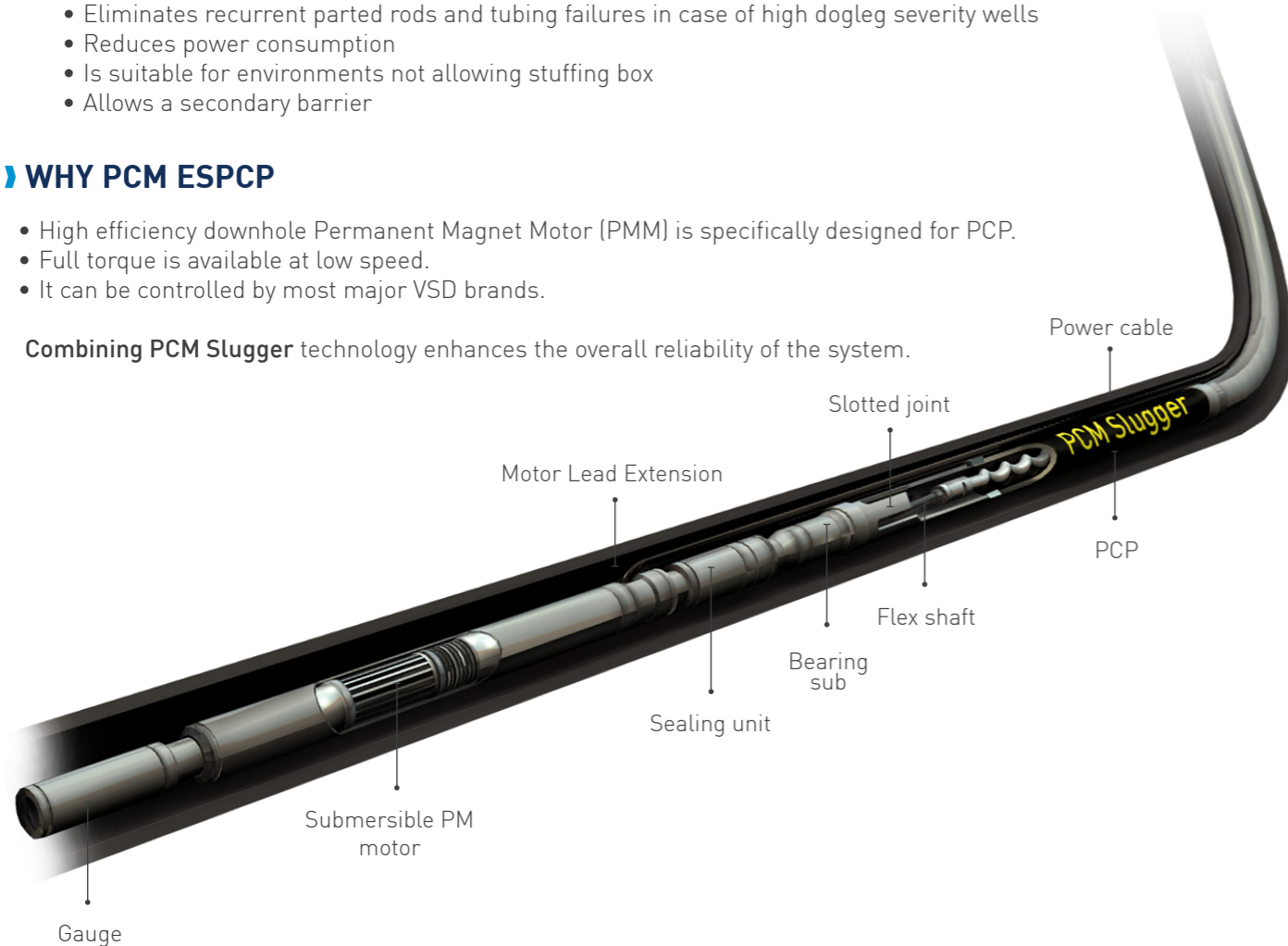
#### Removing the rod string and driving the PCP with a downhole motor:

- Eliminates recurrent parted rods and tubing failures in case of high dogleg severity wells
- Reduces power consumption
- Is suitable for environments not allowing stuffing box
- Allows a secondary barrier

### WHY PCM ESPCP

- High efficiency downhole Permanent Magnet Motor (PMM) is specifically designed for PCP.
- Full torque is available at low speed.
- It can be controlled by most major VSD brands.

Combining PCM Slugger technology enhances the overall reliability of the system.



# PCM INSERT PCP

## RIG LESS PCP TECHNOLOGY

### THE PCP SOLUTION FOR LIGHT WORKOVER OPERATIONS

The Insert PCP system is a system which enables running the PCP bottom hole assembly through the tubing. This avoids a workover to retrieve the tubing each time the pump is run in hole or pulled out.

It can be typically useful when rig availability is poor, for remote wells and could also be considered as a secondary artificial lift back-up to take over quickly production when the primary artificial lift has failed waiting for workover.

There are 2 families of systems :

- With a seating nipple attached to the tubing. It can be either an N11 type (universal nipple used for SRP and PCP) or a dedicated nipple for PCP.
- Nipple less system using a packer-based deployment



Tubing	PCM Pump Series	Pumps
2-7/8"	2-3/8" SH	3E, 6E, 16E, 35E
	2-3/8"	3E, 6E, 16E, 35E
3-1/2"	2-7/8" SH	9E, 22E, 48E
	2-3/8"	3E, 6E, 16E, 35E
4-1/2"	2-7/8"	9E, 13E, 22E, 48E
	3-1/2"	8E, 12E, 17E, 24E, 32E, 33E, 40E, 63E
	4" SH	38E, 45E, 60E, 80E, 100E, 120E, 175E

Pump series marked SH are limited to 150 bar in insert applications.

#### Benefits

- Higher well performance and reliability
- Improve PCP performance (remove flow area restriction from rod/centralizers)
- No gas lock
- Maintenance free
- Suitable for Offshore

#### Features

- Max flow rate: 1 170 m<sup>3</sup>/d (7 360 bpd)
- Max depth: 2 500 m (8 200 ft)
- High performance downhole PMM with sensor-less drive control technology
- Constant torque over a wide range of speed 50-500 RPM
- Lower foot print

#### Benefits

- Reduces workover intervention time and cost
- Possibility to flush-by the pump to circulate fluid
- Ideal for limited rig access and rig availability
- Avoids pulling out the cable and sensors when using downhole gauges during pump replacement

#### Features

- Pump replacement by pulling out only the rod string
- Two anchoring systems available: with a seating nipple or nipple less



# PROGRESSING CAVITY PUMPS RANGE

MODEL	DISPLACEMENT		HEAD		STATOR				ROTOR				Sluggers	
	m <sup>3</sup> /d/RPM	bpd/RPM	m	ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft	Connection	OD mm	OD inch		LENGTH m
<b>PCM MOINEAU™ 2" 3/8 SERIES</b>														
3E600	0,03	0,19	600	1970	2 3/8" EUE	71	2,80	0,90	2,9	3/4" API	40,0	1,57	1,40	4,6
3E1200	0,03	0,19	1200	3940	2 3/8" EUE	71	2,80	1,80	5,9	3/4" API	40,0	1,57	2,30	7,5
3E2400	0,03	0,19	2400	7870	2 3/8" EUE	71	2,80	3,60	11,8	3/4" API	40,0	1,57	4,10	13,5
6E600	0,06	0,38	600	1970	2 3/8" EUE	71	2,80	1,30	4,3	3/4" API	38,0	1,50	1,79	5,9
6E1300	0,06	0,38	1300	4270	2 3/8" EUE	71	2,80	2,61	8,6	3/4" API	40,0	1,57	3,09	10,1
6E2000	0,06	0,38	2000	6560	2 3/8" EUE	71	2,80	3,91	12,8	3/4" API	40,0	1,57	4,44	14,6
6E2600	0,06	0,38	2600	8530	2 3/8" EUE	71	2,80	5,22	17,1	3/4" API	40,0	1,57	5,71	18,7
16E400	0,16	1,0	400	1310	2 3/8" EUE	71	2,80	1,80	5,9	3/4" API	38,0	1,50	2,30	7,5
16E800	0,16	1,0	800	2620	2 3/8" EUE	71	2,80	3,60	11,8	3/4" API	38,0	1,50	4,10	13,5
16E1200	0,16	1,0	1200	3940	2 3/8" EUE	71	2,80	5,40	17,7	3/4" API	38,0	1,50	5,90	19,4
16E1600	0,16	1,0	1600	5250	2 3/8" EUE	71	2,80	7,21	23,6	3/4" API	38,0	1,50	7,71	25,3
35E600	0,35	2,2	600	1970	2 3/8" EUE	70	2,76	5,90	19,4	3/4" API	41,0	1,61	6,00	19,7
35E800	0,35	2,2	800	2620	2 3/8" EUE	70	2,76	7,70	25,3	3/4" API	41,0	1,61	7,81	25,6
35E1000	0,35	2,2	1000	3280	2 3/8" EUE	70	2,76	9,50	31,2	3/4" API	41,0	1,61	9,62	31,6
<b>PCM MOINEAU™ 2" 7/8 SERIES</b>														
9E650	0,09	0,6	650	2130	2 7/8" EUE	75	2,95	1,69	5,6	3/4" API	44,0	1,73	1,95	6,4
9E900	0,09	0,6	900	2950	2 7/8" EUE	75	2,95	2,39	7,8	3/4" API	44,0	1,73	2,65	8,7
9E1300	0,09	0,6	1300	4270	2 7/8" EUE	75	2,95	3,09	10,2	3/4" API	44,0	1,73	3,36	11,0
9E2000	0,09	0,6	2000	6560	2 7/8" EUE	75	2,95	4,49	14,7	3/4" API	44,0	1,73	4,75	15,6
9E2600	0,09	0,6	2600	8530	2 7/8" EUE	75	2,95	5,89	19,3	3/4" API	44,0	1,73	6,16	20,2
9E3300	0,09	0,6	3300	10830	2 7/8" EUE	75	2,95	7,29	23,9	3/4" API	44,0	1,73	7,56	24,8
13E650	0,13	0,8	650	2130	2 7/8" EUE	80	3,15	1,74	5,7	3/4" API	45,1	1,77	2,22	7,3
13E1300	0,13	0,8	1300	4270	2 7/8" EUE	80	3,15	3,48	11,4	3/4" API	45,1	1,77	4,01	13,2
13E2000	0,13	0,8	2000	6560	2 7/8" EUE	80	3,15	5,22	17,1	1" API	50,0	1,97	5,70	18,7
13E2600	0,13	0,8	2600	8530	2 7/8" EUE	80	3,15	6,97	22,9	1" API	50,0	1,97	7,44	24,4
13E3300	0,13	0,8	3300	10830	2 7/8" EUE	80	3,15	8,71	28,6	1" API	50,0	1,97	9,18	30,1
22E600	0,22	1,4	600	1970	2 7/8" EUE	86	3,39	2,61	8,6	3/4" API	43,3	1,70	3,20	10,5
22E1200	0,22	1,4	1200	3940	2 7/8" EUE	86	3,39	5,22	17,1	3/4" API	43,3	1,70	5,70	18,7
22E1800	0,22	1,4	1800	5910	2 7/8" EUE	86	3,39	7,83	25,7	1" API	50,0	1,97	8,35	27,4
22E2400	0,22	1,4	2400	7870	2 7/8" EUE	86	3,39	10,44	34,3	1" API	50,0	1,97	11,02	36,2
48E300	0,48	3,0	300	980	2 7/8" EUE	86	3,39	2,61	8,6	3/4" API	43,0	1,69	3,20	10,5
48E600	0,48	3,0	600	1970	2 7/8" EUE	86	3,39	5,22	17,1	1" API	50,0	1,97	5,70	18,7
48E900	0,48	3,0	900	2950	2 7/8" EUE	86	3,39	7,83	25,7	1" API	50,0	1,97	8,35	27,4
48E1200	0,48	3,0	1200	3940	2 7/8" EUE	86	3,39	10,44	34,3	1" API	50,0	1,97	11,02	36,2
<b>PCM MOINEAU™ 3" 1/2 SERIES</b>														
8E900	0,08	0,5	900	2950	3 1/2" EUE	90	3,54	1,69	5,6	3/4" API	50,9	2,00	1,95	6,4
8E1800	0,08	0,5	1800	5910	3 1/2" EUE	90	3,54	3,09	10,2	3/4" API	50,9	2,00	3,36	11,0
8E2700	0,08	0,5	2700	8860	3 1/2" EUE	90	3,54	4,49	14,7	3/4" API	50,9	2,00	4,75	15,6
12E700	0,12	0,8	700	2300	3 1/2" EUE	90	3,78	1,69	5,6	1" API	53,5	2,11	1,95	6,4
12E1400	0,12	0,8	1400	4590	3 1/2" EUE	90	3,78	3,09	10,2	1" API	53,5	2,11	3,36	11,0
12E2100	0,12	0,8	2100	6890	3 1/2" EUE	90	3,78	4,49	14,7	1" API	53,5	2,11	4,75	15,6
12E2800	0,12	0,8	2800	9190	3 1/2" EUE	90	3,78	5,89	19,3	1" API	53,5	2,11	6,18	20,3
17E600	0,17	1,1	600	1970	3 1/2" EUE	90	3,54	1,69	5,6	3/4" API	49,0	1,93	1,95	6,4
17E1200	0,17	1,1	1200	3940	3 1/2" EUE	90	3,54	3,09	10,2	3/4" API	49,0	1,93	3,36	11,0
17E1800	0,17	1,1	1800	5910	3 1/2" EUE	90	3,54	4,49	14,7	3/4" API	49,0	1,93	4,75	15,6
17E2400	0,17	1,1	2400	7870	3 1/2" EUE	90	3,54	5,89	19,3	1" API	51,0	2,01	6,18	20,3
17E3000	0,17	1,1	3000	9840	3 1/2" EUE	90	3,54	7,29	23,9	1" API	51,0	2,01	7,58	24,9
24E600	0,24	1,5	600	2130	3 1/2" EUE	96	3,78	2,03	6,7	1" API	51,3	2,02	2,50	8,2
24E1300	0,24	1,5	1300	4270	3 1/2" EUE	96	3,78	4,07	13,3	1" API	51,3	2,02	4,44	14,6
24E2000	0,24	1,5	2000	6560	3 1/2" EUE	96	3,78	6,10	20,0	1" API	51,3	2,02	6,57	21,6
24E2600	0,24	1,5	2600	8530	3 1/2" EUE	96	3,78	8,14	26,7	1" API	51,3	2,02	8,61	28,2
32E800	0,32	2,0	800	2620	3 1/2" EUE	96	3,78	2,75	9,0	1" API	51,0	2,01	3,22	10,6
32E1500	0,32	2,0	1500	4920	3 1/2" EUE	96	3,78	5,50	18,1	1" API	51,0	2,01	6,00	19,7
32E2200	0,32	2,0	2200	7220	3 1/2" EUE	96	3,78	8,26	27,1	1" API	51,0	2,01	8,80	28,9
32E3000	0,32	2,0	3000	9840	3 1/2" EUE	96	3,78	11,01	36,1	1 1/2" API	57,0	2,24	11,55	37,9
33E600	0,33	2,1	600	1970	3 1/2" EUE	90	3,82	3,09	10,2	3/4" API	46,0	1,81	3,36	11,0
33E900	0,33	2,1	900	2950	3 1/2" EUE	90	3,82	4,49	14,7	3/4" API	46,0	1,81	4,75	15,6
33E1200	0,33	2,1	1200	3940	3 1/2" EUE	90	3,82	5,89	19,3	3/4" API	46,0	1,81	6,18	20,3
33E1800	0,33	2,1	1800	5910	3 1/2" EUE	90	3,82	8,69	28,5	3/4" API	46,0	1,81	9,00	29,5
40E600	0,40	2,5	600	1970	3 1/2" EUE	96	3,78	2,75	9,0	1" API	51,1	2,01	3,30	10,8
40E1200	0,40	2,5	1200	3940	3 1/2" EUE	96	3,78	5,50	18,1	1" API	51,1	2,01	6,00	19,7
40E1800	0,40	2,5	1800	5910	3 1/2" EUE	96	3,78	8,26	27,1	1" API	51,1	2,01	8,80	28,9
40E2400	0,40	2,5	2400	7870	3 1/2" EUE	96	3,78	11,01	36,1	1 1/2" API	57,0	2,24	11,55	37,9
63E400	0,63	4,0	400	1310	3 1/2" EUE	96	3,78	2,75	9,0	1" API	51,2	2,01	3,30	10,8
63E800	0,63	4,0	800	2620	3 1/2" EUE	96	3,78	5,50	18,1	1" API	51,2	2,01	6,00	19,7
63E1200	0,63	4,0	1200	3940	3 1/2" EUE	96	3,78	8,26	27,1	1" API	51,2	2,01	8,80	28,9
63E1600	0,63	4,0	1600	5250	3 1/2" EUE	96	3,78	11,01	36,1	1 1/2" API	57,0	2,24	11,55	37,9

## ISO 9001 & ISO 15136-1 STANDARDS



MODEL	DISPLACEMENT		HEAD		STATOR				ROTOR				Sluggers	
	m <sup>3</sup> /d/RPM	bpd/RPM	m	ft	Connection	OD mm	OD inch	LENGTH m	LENGTH ft	Connection	OD mm	OD inch		LENGTH m
<b>PCM MOINEAU™ 4" SERIES</b>														
38E1000	0,38	2,4	1000	3290	4" NU	109	4,29	2,88	9,6	1 1/2" API	57,5	2,26	3,46	11,4
38E2000	0,38	2,4	2000	6570	4" NU	109	4,29	5,76	18,1	1 1/2" API	57,5	2,26	6,29	20,8
45E800	0,46	2,9	800	2630	4" NU	109	4,29	2,88	9,6	1 1/2" API	57,5	2,26	3,46	11,4
45E1600	0,46	2,9	1600	5250	4" NU	109	4,29	5,76	18,9	1 1/2" API	58,0	2,28	6,29	20,6
45E2400	0,46	2,9	2400	7880	4" NU	109	4,29	8,64	28,4	1 1/2" API	58,0	2,28	9,25	30,4
45E3200	0,46	2,9	3200	10500	4" NU	109	4,29	11,53	37,1	1 1/2" Mod.	57,5	2,26	12,03	39,5
60E600	0,61	3,8	600	1970	4" NU	109	4,29</							



## SURFACE DRIVES

PCM Driver™ driveheads are safe, robust and reliable surface PCP driveheads. They drive the rotation of the rotor, control backspin rotation, support the weight of the rod string and seal around the polished rod.

### CD-SERIES DRIVEHEAD

The PCM CD-Series is PCM's most popular drivehead using a proven design that has more than 30 years field use. It represents the highest market standard and together with PCM EcoSeal technology, it ensures zero leakage and easy maintenance.

#### PCM CD-Series features

CD-30	30 hp	6.9 T (HD 10.1 T)	1 630 N-m, 1 200 ft.lb
CD-60	60 hp	10.1 T (HD 14.9 T)	2 278 N-m, 1 680 ft.lb
CD-100	100 hp	14.9 T (HD 17.7 T)	2 845 N-m, 2 100 ft.lb
CD-150	150 hp	17.7 T	2 845 N-m, 2 100 ft.lb

#### PCM CD-Series benefits

- User friendly and low maintenance
- Safe with all rotating parts enclosed and an internal brake
- Heavy Duty version (HD) allows higher axial load

### PCM ECOSEAL

To meet the highest environmental demand for PCPs, PCM EcoSeal stuffing box features an integral seal system which protects the environment by providing a reliable seal between the rotating polished rod and the stationary wellhead and drive. It is the standard seal on all driveheads provided by PCM.

#### Features

- High pressure and temperature design
- Increased safety with no exposed rotating parts
- Long life

#### Benefits

- Redundant seal design
- No seepage
- Easy maintenance

Conventional stuffing box is also available as an option

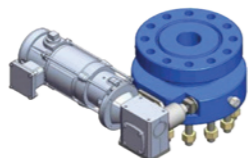
### ELECTRIC MOTOR - ASYNCHRONOUS MOTOR ADAPTED FOR PCP OPERATIONS

- High efficiency motor
- IEC Exc , IEC Exd, NEMA explosion proof
- From 11 kW to 90 kW (15 hp to 120 hp), 4 poles or 6 poles motor

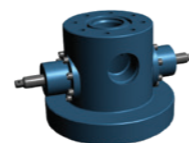
### SURFACE ACCESSORIES



**PCM Pancake**  
Easily locks the polished rod to ensure safe drivehead maintenance



**Tubing Rotator**  
To reduce tubing wear and extend tubing string life in deviated wells



**Integrated BOP**  
To safely isolate the well with the polished rod



### PCM PERMANENT MAGNET MOTOR DRIVEHEAD

PCM Permanent Magnet Motor (PMM) driveheads are more energy efficient than conventional driveheads. Designed with minimal components, they eliminate belts, sheaves and motor frames. It is available with either PCM EcoSeal or stuffing box.

#### DPM Features

DPM-30	30 hp	22.8 T	540 N-m, 400 ft.lb
DPM-50	50 hp	22.8 T	950 N-m, 700 ft.lb
DPM-100	100 hp	22.8 T	2 030 N-m, 1 500 ft.lb
DPM-150	150 hp	22.8 T	2 980 N-m, 2 200 ft.lb

#### Benefits

- Highly efficient PMM with hollow shaft
- Failsafe resistive braking system with VFD
- Low maintenance and easy installation

### PCM CG-H HYDRAULIC DRIVEHEAD

The robust gearbox ensures safe and reliable operation when hydraulic power is preferred.

#### Features

CG-40 HP	40 hp	6.9 T	1 630 N-m, 1 200 ft.lb
CG-60 HP	60 hp	14.8 T	2 275 N-m, 1 680 ft.lb

#### Benefits

- Low speed drivehead with gear for sandy viscous oil production

### PCM IPAC - VSD WITH INTELLIGENT PUMP AUTOMATION CONTROLLER

The PCM-designed HMI of PCM IPAC is intuitive and easy to navigate.

#### Performances

- Power supply: 380-480 / 535-690 VAC
- Frequency: 50 or 60 hz
- VSD: 11 to 90 kW (15 to 120 hp)
- Enclosure: IP55 or Nema 3R
- Environment: -10°/ +50°C option: -40°C 95% Humidity

#### Functions

- Control PCP based on speed or fluid level when a downhole gauge is installed
- Torque control to protect rod string and pump
- Saves last 6 months operating parameters
- Can be connected to SCADA
- Option to connect to your smart device
- Optional harmonics filters available







## TUBING STRING

The tubing string completion is adapted to well conditions to ensure the best operational efficiency.

- › **CROSS OVER** - Connect any bottom hole items
- › **PUP JOINT** - Allow free motion of rotor head
- › **TOP BUSHING** - Rotor space-out on stator top
- › **TAG BAR** - Rotor space-out on stator bottom
- › **TORQUE ANCHOR** - Prevent tubing back-off
- › **GAS SEPARATOR** - Limit free gas intake

### ADVANCED SOLUTIONS

#### › **AUTO TUBING DRAIN (ATD)** - Avoid solids accumulation above the pump during shutdown

- Automatic sleeve activated when pump stops
- Tubing fluid column is directly flushed to the annulus



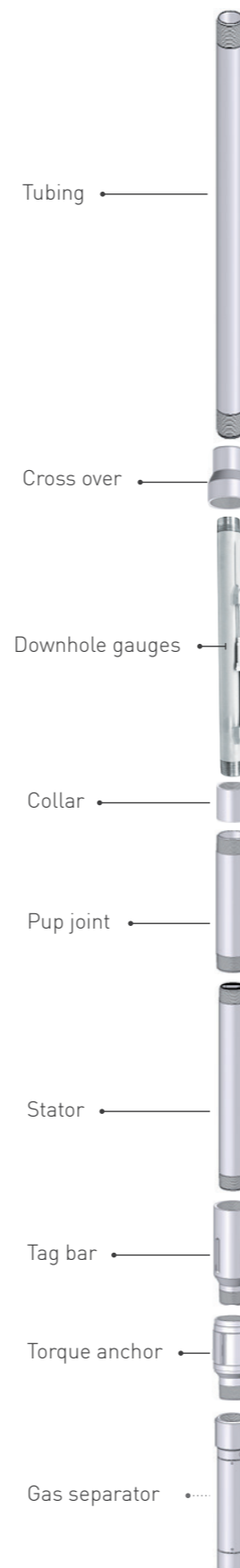
#### › **DOWNHOLE GAUGES** - Monitor and control fluid level

- Protect the pump from pump-off
- Optimize production
- Single P, T sensors (intake) or dual P, T sensors (intake and discharge)



## ROD STRING

Rod string completion is carefully designed to suit your project, well profile, torque requirements and service tools available on site.



#### › **POLISHED ROD** - Ensure an appropriate sealing

- 11 to 44 ft length
- 1¼", 1½" and other size available on request



#### › **SUCKER RODS** - Rod string

- Size adapted to torque requirements and tubing size.
- Grad D or high strength available
- ¾", 7/8", 1", 1⅛", 1¼", 1½"



#### › **PONY RODS** - Adjust rod string length

- Available in 2,4,6,8,10,12 ft
- Any SR size available



#### › **COUPLINGS** - Connect rod string elements

- Polished rod to sucker rod
- Sucker rod to sucker rod or to centralizers

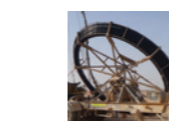


#### › **CENTRALIZERS** - Prevent tubing wear

- Non-rotating centralizers
- Spindle/sleeve type
- Available for high temperature (metallic sleeve)



### ALTERNATIVE OPTIONS [optional]

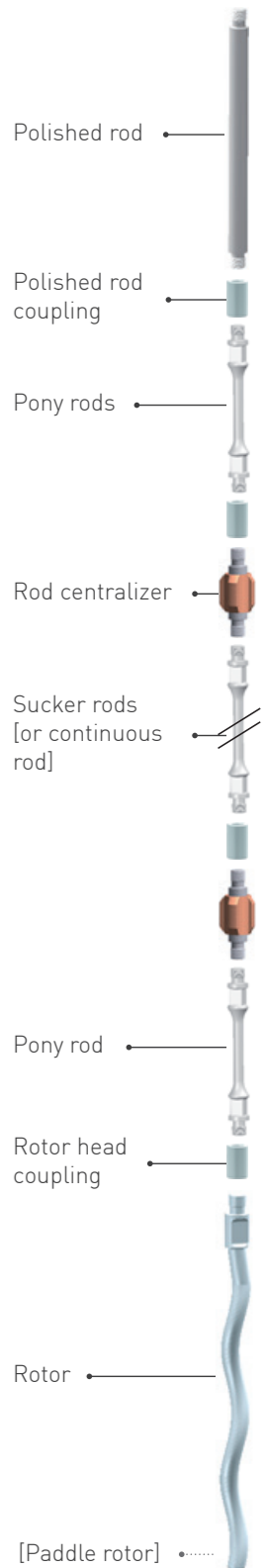


#### › **CONTINUOUS RODS** - Highly deviated well, faster RIH

- High torque capabilities
- Continuous design to reduce tubing wear

#### › **PADDLE ROTOR** - Avoid solid plugging

- 2 ft extra length flattened rotor
- Break solids accumulation at stator suction





## SERVICES

### WORKSHOP

- **Inventory:** PCM workshops are strategically located for reliable and continuous supply close to operations.
- **PCP bench test:** A requirement in any workshop, a hydraulic bench to generate a pump curve across specified pressure and production rates. Understanding anticipated elastomer swell downhole and analyzing with actual bench test results will provide better information for pump selection and performance. Pump tests are performed according to the ISO 15136-1 standard.
- **Failure analysis:** Failure analysis is a proven method to avoid repeated failures. PCM has implemented the ISO 15136-1 standard using field data and years of experience. PCM can analyze pumps from all manufacturers,



### INFIELD SERVICES

- **Installation:** PCM installation guidelines make it simple and easy. Our specialists can be onsite or provide training to do it yourself.
- **Start-up:** this is a critical phase after the installation where PCM can accompany customers to ensure a smooth run of the PCP in the well.
- **Troubleshooting:** Our experts will support your team to analyze any event that would be considered abnormal and quickly propose a remediation to have the pump up and running
- **Monitoring:** Monitoring production using the parameters in the VSD and understanding pump performance versus downhole conditions is key to improve production and run life. PCM experts can help ensure optimal pump draw down from your well with a high reliability factor.
- **Maintenance:** With all rotating equipment it is important to check and service for safe and reliable operation. PCM can help you replace the necessary parts to make your equipment last longer.

### APPLICATION ENGINEERING

- **Well Design:** PCPs can be used in a wide range of applications. PCM application experts can help you select the best pump size, geometry, elastomer and accessories to meet your production objectives.
- **Rotor sizing selection:** PCM has over 30 years of field data to help anticipate elastomer swell and select the correct rotor size matching downhole conditions. Rotor sizing is a critical step to ensure expected pump performance
- **Optimization:** PCM can help optimize well draw down based on production rate, dynamic level and pump capacity. Analysis can help find further performance improvements



### TRAINING: BACK TO SCHOOL

PCM has created our **BACK TO SCHOOL Series**, a practical training program. We are committed to contribute and share best practices in our PCP industry, along with new technologies and trends. All participants will receive an official training certificate duly endorsed by PCM. It represents a unique experience to connect with leading PCP experts.

**BACK TO SCHOOL** can be attended in various manners to facilitate and promote knowledge sharing:

- Online live training
- Onsite in-person
- At PCM facilities in-person

Webinars on specific topics are available in the Education section on [www.pcmals.com](http://www.pcmals.com).



### PCM SOFTWARE SUITE

PCM provides high standard innovative PCP solutions for Artificial Lift with unique in-house software.



design

#### PCM DESIGN

PCM Design is a user-friendly web-based software solution for design, evaluation and optimization of PCP Artificial Lift Systems.

##### Online

- Stay connected anytime, anywhere
- Automatic updates to the latest version

##### Simple

- Intuitive, easy to understand and simple to use
- Minimized data input time

##### Expert

- Optimize and support your PCP system throughout its lifecycle
- Understand in-field behavior



field track

#### PCM FIELD TRACK

PCM Field Track software is an online application to support service activities and provide adapted reporting to our clients. It measures PCP system performance all along its life from storage to tear down.

##### PCP operations management tool

- Inventory management
- Data & event recording
- Failure analysis tracking
- Key performance indicators



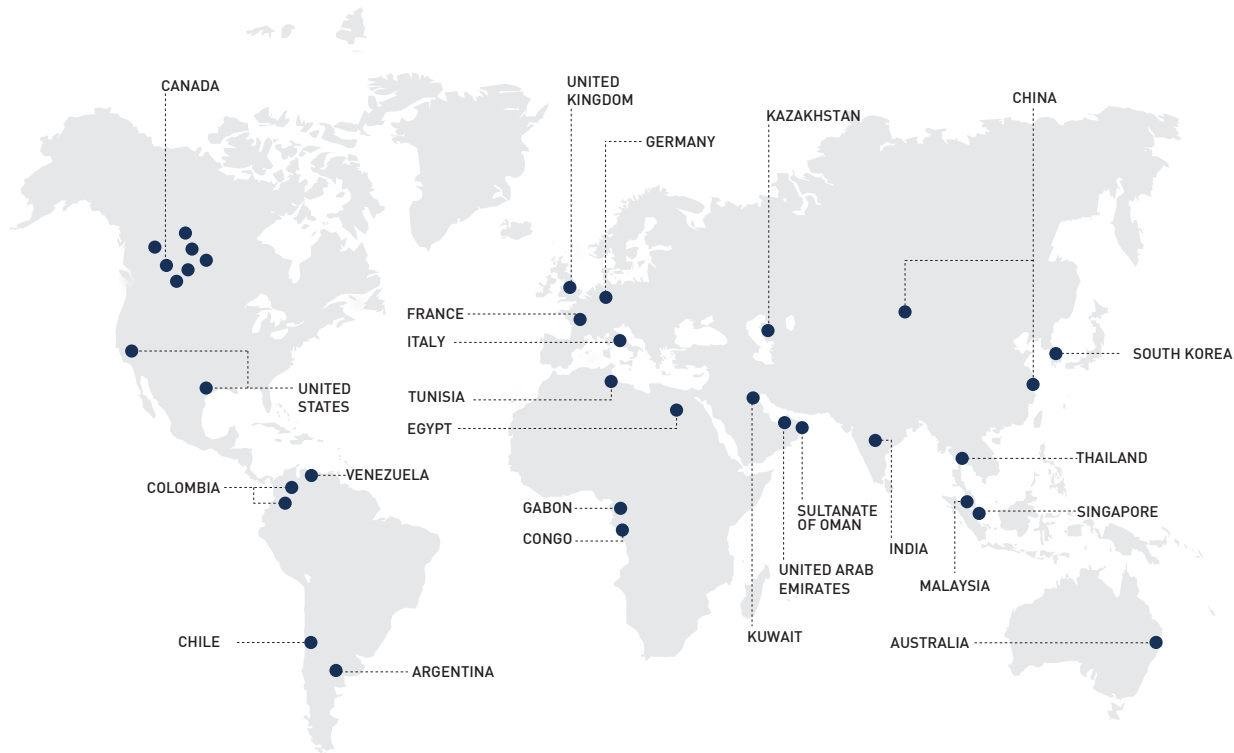
failure analysis

#### PCM FAILURE ANALYSIS

PCM Failure Analysis is a powerful analytical and reporting software solution using ISO 15136-1 methodology

- Failure mode & root cause analysis to help avoid future failures
- Improve current operations for longer pump run life

### ABOUT PCM



Founded in 1932 by René Moineau, the inventor of the Progressing Cavity Pump, and Robert Bienaimé, from Gévelot Group, **PCM is today one of the world's leading manufacturers of positive displacement pumps and fluid-handling equipment.**

To meet demand around the globe while adapting to specific considerations in the different regions in which we operate, **PCM has established a strategy of localized organisations designed to promote commercial and industrial proximity to customers and enhance operational efficiency.**