

INDUSTRY



**SETTING
INNOVATIVE
STANDARDS**

MAGNETIC DRIVE PUMPS

M PUMPS OFFERS THE MOST ADVANCED REAR CONTAINMENT SHELL ON THE MARKET.

A magnetic drive pump uses a magnetic field to create the rotation of the impeller (or any other device utilized to displace fluid). The external magnet is mounted on the motor shaft. The liquid end consists of pump impeller (or any other device used to displace fluids) and an internal magnet mounted onto the driven shaft which is supported by bushing assembly and HERMETICALLY sealed by containment shell. Without the need of a mechanical seal.

The external magnet begins to rotate when the motor is started. The rotating magnetic field effects the inner magnet which begins to rotate the impeller as the same speed of the external magnet to displace the fluid.

MAGNETIC DRIVE PUMPS OFFER A SERIES OF SUPERIOR ADVANTAGES OVER MECHANICAL SEAL PUMPS:

- Pump is sealless guaranteeing operational safety for operators and environment, most of all in case of critical, hazardous, corrosive or expensive chemicals pumping.
- Without mechanical seal, both initial costs of the same and cumbersome auxiliary API flushed plans are avoided.
- For the same reason, pump selection, operation and maintenance are much simpler and less expensive than mechanical seal.
- Ability to handle high gas content fluids in which most mechanical seals would fail due to poor lubrication and cooling.

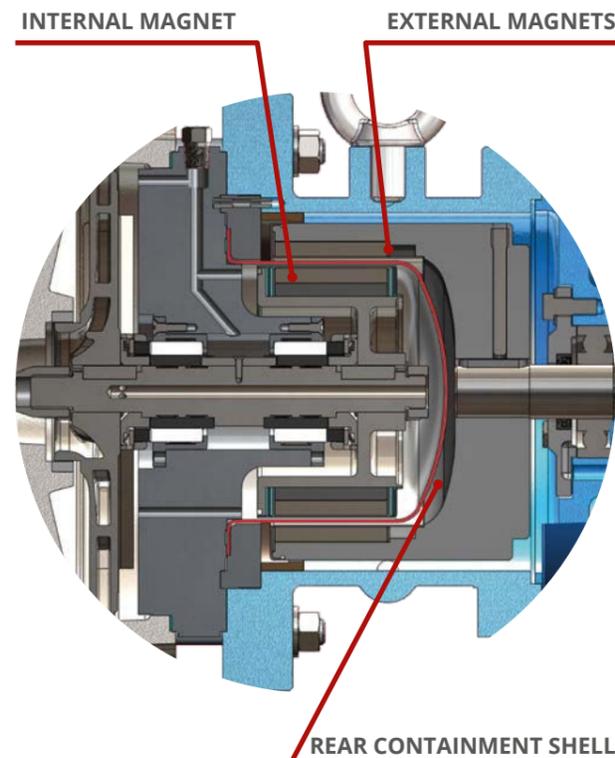
Are you concerned about energy costs, maintenance costs (Spare parts and downtime), leakages of dangerous/expansive chemicals, frequent seal failure and complex sealing system? M Pumps has the solution to address your concerns with its advanced sealless pump technology.

With its superior technology applied on the HYBRID containment shell which generates negligible Eddy current loss, M Pumps is now able to directly replace double mechanical seal pumps and canned motor pumps using standard motors. It is now possible to upgrade your conventional pumps into M Pumps most advanced and environmental friendly sealless pumps.

M PUMPS HAS SOLVED ALL THESE ISSUES WITH THE HYBRID CONTAINMENT SHELL (SEE PAGE 9)

The Hybrid Rear Shell offers several advantages:

- Vs other magnetic drive manufacturers, much lower power absorption.
- Consequently the power consumption is much lower, offering very competitive Total Cost of Ownership.
- Almost negligible heat generation, with easy handling of: low boiling chemicals/cooling agents.
- 50 bar g design pressure and -90°C/+200°C design temperature.
- On demand: Reliable, immediate temperature reading (temperature sensor is located at the source of the magnetic field, providing accurate reading and timely response, avoiding pump failure).



There are NO MORE technical reasons to choose a mechanical seal pumps Vs a M PUMPS magnetic sealless pump.

M PUMPS RANGE

CENTRIFUGAL PUMPS

State of the art centrifugal pumps from the simplest to the most demanding industrial process application. Suitable for transfer, unloading, circulation and many other applications. High efficiency, long life and low cost maintenance. Meeting several international standards (ISO/DIN/ANSI/API) and available in both magnetic drive (sealless) and traditional mechanical seal.

- Flow up to 4000 m³/h
- Head up to 2200 m
- System pressure from vacuum up to 1500 bar
- Temperature from -150°C up to +400°C
- No heat exchanger required up to +350°C

REGENERATIVE TURBINE PUMPS

Low to medium flows, pulsation free, suitable where high pressure is required. Perfect solution where traditional centrifugal pumps are not suitable (used instead of a multistage pumps).

- Flow up to 24 m³/h
- Head up to 800 m
- System pressure from vacuum up to 1500 bar
- Temperature from -150°C up to +400°C
- No heat exchanger required up to +350°C

SIDE CHANNEL PUMPS

316 stainless steel (or better) multi-stage barrel construction. Ideal to pump liquefied gasses and liquids under vapor pressure like condensate, refrigerant, boiler feed water or LPG (up to 50% gas content).

- From low to medium flows
- Best choice for truck unloading and natural gas handling.
- Low NPSHr 0,5 m.
- Self priming up to 5 m.
- Flow up to 40 m³/h
- Delivery Head up to 450 m
- System pressure up to 50 bar
- Temperature from -90°C up to +250°C

VOLUMETRIC PUMPS

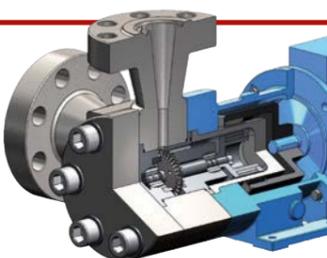
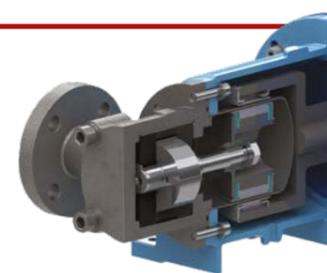
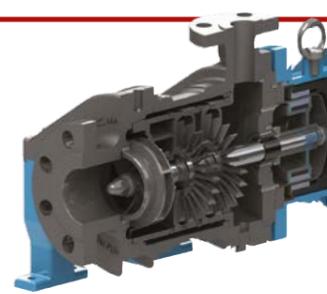
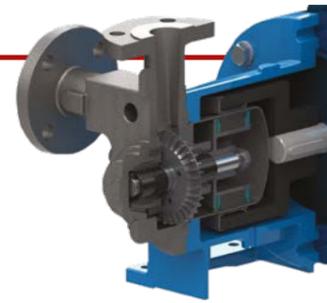
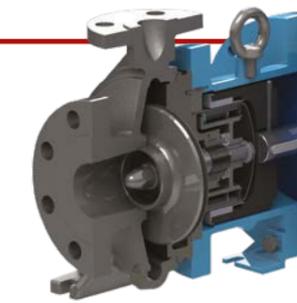
- SLIDING VANE PUMPS
 - Flow rates up to 3000 l/h, discharge pressure up to 48 bar g.
 - Suitable for viscosities from 1 to 1000 cP
 - Pulsation free dosing/sampling/transfer pumps
- EXTERNAL GEAR PUMPS
 - Flow rates up to 80 m³/h, discharge pressure up to 30 bar g.
 - Suitable for lubricating media up to 25000 cP
 - Temperature up to +200°C
- HOLLOW DISC
 - Flow rates up to 38 m³/h, discharge pressure up to 5 bar g
 - Viscosities up to 10000 cP

SPECIAL PUMPS

M PUMPS is able to design and manufacture bespoke pumps for the most demanding applications:

- High system pressure (up to 1500 bar g)
- High design temperature (400°C)
- Low design temperature (liquid CO₂ cryogenic application)
- Solid content
- Jacketing
- Exotic materials such as: Hastelloy C[®] 276, Titanium, Monel[®]

All above parameter are indicative and not associated.



CENTRIFUGAL PUMPS

Extremely wide centrifugal pump range, meeting and exceeding international standards (DIN EN 22858 – ISO 2858, ANSI B73.3, API 685 2nd Ed & API 610 11th Ed) and available in both magnetic drive and traditional mechanical seal design.

These pumps can be supplied both with close coupled and long coupled version (with or without baseplate). Metallic wetted parts from AISI 316 (STD), Duplex, Hastelloy C, Titanium etc.

Several non-metallic models for corrosive and ultra pure application (PFA lined cast iron pump heads, vertical pumps with solid plastic, injection molding both in PP and PVDF).

- Closed impeller
- High efficiency
- SiC bearings
- Modular construction 4000 m³/h – 700 m
- -150°C to +400°C

(PETROLEUM, PETROCHEMICAL & GAS PROCESS SERVICES)



CNV MAG-M

Centrifugal Vertical Sealless Pump

Mag-Drive
Flow up to 500 m³/h
Head up to 120 m
Length up to 7 m

DIN EN 22858



CL MAG-M SERIES

Horizontal Lined Centrifugal Magnetic Sealless Pump

Acc. to DIN EN 22858 - ISO 5199
Flow up to 90 m³/h
Head up to 63 m



CN SEAL-M SERIES

Centrifugal Pump-Mech. Seal

Acc. to DIN EN 22858 - ISO 5199
Flow up to 4000 m³/h
Head up to 220 m



CL SEAL-M SERIES

Lined Centrifugal Pump-Mech. Seal

Acc. to DIN EN 22858 - ISO 5199
Flow up to 550 m³/h
Head up to 170 m



CN MAG-M SERIES

Centrifugal Sealless Pump

Acc. to DIN EN 22858 - ISO 5199
Flow up to 4000 m³/h
Head up to 220 m

M PUMPS STD (MAG DRIVE)



CM MAG-M SERIES

Centrifugal Sealless Pump

Metallic Head
Flow up to 35 m³/h
Head up to 36 m



C MAG-PL SERIES

Lined Centrifugal Sealless Pump

Flow up to 140 m³/h
Head up to 44 m



CM MAG-P SERIES

Reinforced Plastic Centrifugal Sealless Pump

Plastic Head Injection Molding
Flow up to 35 m³/h
Head up to 23 m

ANSI B73.3



CN MAG-M SERIES

Centrifugal Sealless Pump

ANSI B73.3
Flow up to 4000 m³/h
Head up to 220 m



CN MAG-M SERIES

Centrifugal Sealless Pump

ANSI B73.3
Flow up to 100 m³/h
Head up to 75 m



CL MAG-M SERIES

Centrifugal Sealless Pump

ANSI B73.3
Flow up to 90 m³/h
Head up to 63 m



CL MAG-M SERIES

Centrifugal Magnetic Sealless Pump

ANSI B73.3
Flow up to 90 m³/h
Head up to 63 m

REGENERATIVE TURBINE PUMPS

Superior performances (high head, very high overall efficiency, pulsation free and very low NPSH r) thanks to both M PUMPS design and choice of materials (AISI 316, PEEK etc.)

These pumps, thanks to the small footprints, and custom design, can be used in any industrial application, from demanding 24/7 Oil&Gas application to service duties for OEMs

- Low to medium flow (up to 22 m³/h)
- High head (up to 800 meters; very often used instead of multistage pumps)
- Pressure systems from vacuum to 1500 bar
- Temperatures from -150°C to +400°C (no external cooling required up to 350°C)
- Pulsation free

TURBINE

Hydraulically-balanced floating impeller design that builds pressure equally on both sides.

The four available models cover several type of applications and budget where low to medium flows and high head are required.

The CT MAG-M sealless regenerative turbine pumps are designed with first centrifugal stage and one or two turbine stages. Ideal for low flow-high head (up to 800 meters) applications and low NPSH (as low as 0,5 meters).



T MAG-M SERIES

Peripheral Pump

Flow up to 9 m³/h
Head up to 90 m



TECO MAG-M SERIES

Peripheral Pump

Flow up to 1,5 m³/h
Head up to 85 m



T MAG-P SERIES

Solid Plastic Peripheral Pump

Flow up to 13 m³/h
Head up to 53 m

VOLUMETRIC PUMPS

M PUMPS, over the years, was required to develop several volumetric pumps to meet its customers' demands.

These volumetric pumps, benefit from M PUMPS hydraulic knowledge and most of state-of-the-art magnetic drive design experience.

These type of pumps are commonly available in the market with traditional mechanical seal technology; M PUMPS care for centrifugal pumps was transferred to volumetric technology and coupled with the most advanced magnetic drive solution currently available.

M PUMPS VOLUMETRIC PUMPS ARE

- Robust, industrial process pumps
- Pulseless
- Leak-free
- Flow rate virtually unaffected by pressure, temperature and viscosity variation

SLIDING VANE

- Pulsation free, dosing/sampling/small transfer pump.
- Viscosities 1 to 1000 cP.
- Flow rates to 3000 l/h Disch. press up to 48 bar.



V IN LINE SERIES

Sliding Vane Pump

Flow up to 3 m³/h
Head up to 12 bar



V MODULAR SERIES

Multistage Sliding Vane Pump

Flow up to 2 m³/h
Head up to 48 bar



VP SERIES

Solid Plastic Sliding Vane Pump

Flow up to 3 m³/h
Head up to 5 bar

EXTERNAL GEAR

- Suitable for lubricating media with viscosities up to 25000 cSt
- Temp up to +200°C



GS MAG-M SERIES

External Gear Pump

Flow up to 80 m³/h
Head up to 30 bar

HOLLOW DISC

- Self priming, reversible flow heavy duty mag drive pumps.
- Suitable for oily media, paints, glues, resins, molasses, coal, tar.
- Viscosities up to 10000 cSt.



MHV MAG-M SERIES

Hollow Disc Pump

Flow up to 38 m³/h
Head up to 8 bar

SIDE CHANNEL PUMPS

316 stainless steel Multi-Stage Barrel construction. Ideal to pump liquefied gasses and liquids under vapor pressure like condensate, refrigerant, boiler feed water or LPG (up to 50% gas content).

Applications: Chemical and Petrochemical Industries, Refineries, Liquid gas plants, Power plants truck loading and unloading.

SIDE CHANNEL

- Low NPSHr (as low as 0,5 metres)
- Able to deliver up to 50% gas content
- Self priming
- Flows up to 40 m³/h
- Head up to 450 m (multi stage)
- System pressure 50 bar g
- Operating temperature -90 to +250°C
- Heavy Duty Centerline
- Barrel construction (No intermediate gaskets)

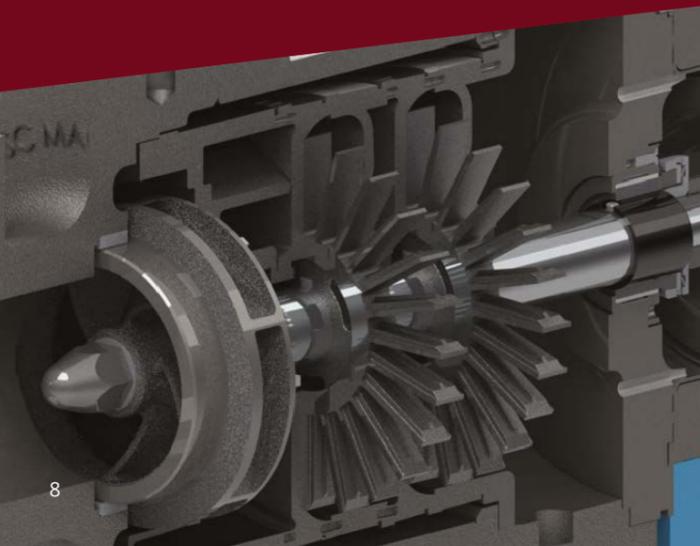


SC MAG-M SERIES

Centrifugal Side Channel Combination Pump

Flow up to 40 m³/h
Head up to 450 m
NPSH up to 0,5 m

- Aggressive, explosive and toxic liquids
- Isobutylene, butadiene, propylene
- Hydrocarbons
- Liquid gases
- Boiler water
- LPG
- Ammonia
- Methyl chloride, vinyl chloride



HYBRID REAR CONTAINMENT SHELL



The PATENT US 9841025 B2 hybrid echnology containment shell combines the reliability of a standard inner metallic shell (High Pressure and High Temperature) with the strength of Carbon Fibre outer shell to achieve an energy efficient (Reduction in magnetic loss and cost of ownership) and environmental friendly Hermetically sealed) solution.

Thanks to our 40 years of experience in magnetic drive technology, M Pumps is able to supply innovative and unique rear containment shell on magnetic drive pumps to enhance the competitiveness and operational efficiency in today's process industry. As technology advances, the need for high pressure, high temperature and energy efficient become the top priorities among pump users.

Staying ahead of these priorities required M Pumps to adopt a forward thinking and proactive approach to pump design.

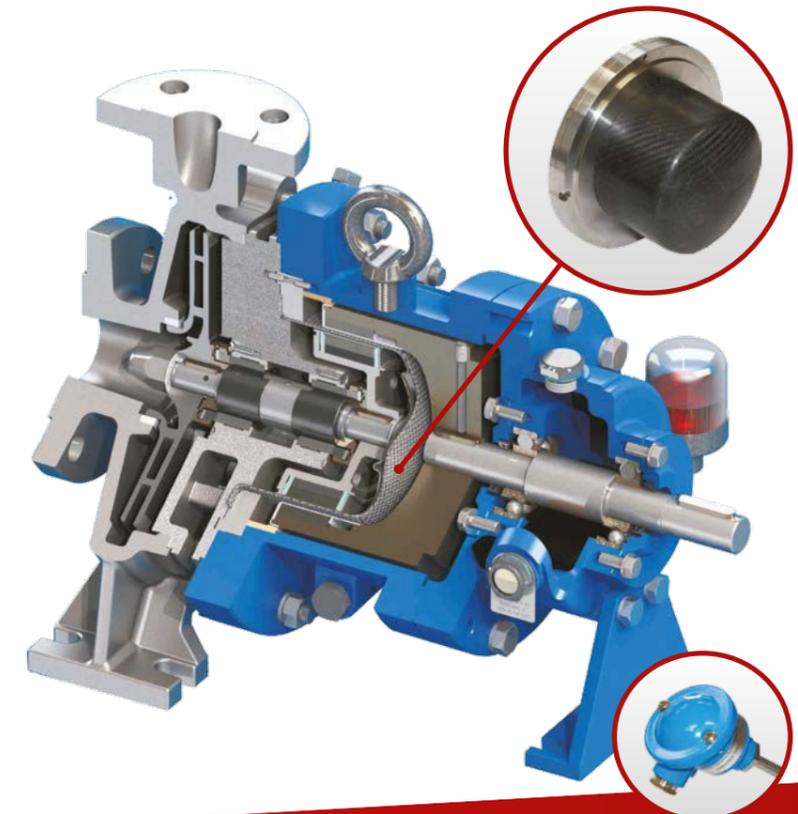
AVAILABLE ON ALL M PUMPS PROCESS PUMPS

Based on this Philosophy, M Pumps has created an advanced High pressure, High Temperature and Energy efficient Rear Containment Shell to eliminate the various concerns on the use of magnetic driven pumps in the process industry.

M PUMPS Hybrid Technology is the most advanced and attractive ENERGY SAVING solution available now in the market. Innovative and unique M Pumps solution offering:

MAIN ADVANTAGES

- Impressive reduction in Magnetic losses
- High Pressure design: vacuum to 50 bar g
- High Temperature design: -90°C to 200°C
- Motor power installation up to 1000 kW



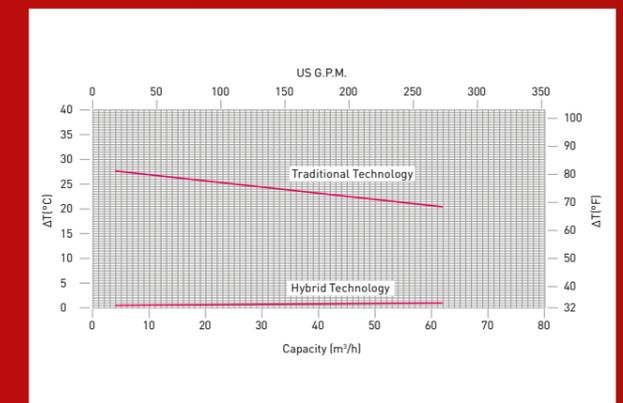
MAG LOSSES AND HEAT REDUCTION

Hybrid shell containment comparison (*)					
	MATERIAL	DES PRESS (bar)	DESIGN TEMP °C	MAG-LOSSES (kW)	NOTES
HYBRID M PUMPS	HASTELLOY C / CARBON FIBER	50	-90/+200°C	0,78	EXTREMELY RELIABLE/SUITABLE FOR TEMP. PROBE/GREAT PRICE ADVANTAGE
	ZIRCONIUM OXYDE	16	-190/+350°C	/	HIGH COST AND MUCH LOWER PRESSURE
COMPETITORS	METAL ZIRCONIUM OXYDE	16	-190/+350°C	1,5	HIGH COST, MUCH LOWER PRESSURE AND HIGHER MAG LOSS COMPARED TO M PUMPS
	COMPOSITE PEEK	16(≤ 20°C)	-40/+120°C	/	HIGH COST AND PRESSURE AND TEMPERATURE LIMITATION
	PTFE - CARBON FIBER	16	-20/+200°C	/	PRESSURE LIMITS AND OVERSIZING OF MAGNET (DE-COUPLING RISK)
	BOROSILICATE GLASS	10	-40/+180°C	/	PRESSURE LIMITS, VERY FRAGILE AND HIGH COST (OVERSIZED MAGNET)

(*) Comparison with installed motor 18,5 kW, 2 poles, 50 Hz.

Comparison between M PUMPS and other rear shell solutions available now on the market.

MINIMIZED TEMPERATURE RISING ON REAR CASING REGION



Hybrid technology reduces greatly heat generation in the rear casing region. This benefit is particularly important when pumping low boiling liquids.

REFERENCE LIST

YEAR	END USER/EPC CONTRACTOR	PLANT TYPE PROJECT NAME	PLANT TYPE	COUNTRY
2011	Arkema	Rho Pmm Plant	Hot Oil Service	Italy
2011	Ballestra	Erca Moerdijk	Ethylene Oxyde	Olanda
2012	Viny Thai Public Co., Ltd	Chemical processing; Ethylene Dichloride (with 0.2mm Particles)	Centrifugal ISO15783	Thailand
2013	Abb Power One	Cooling circulator unit for solar power inverter	Solar Field Plants	Europe USA
2013	Yara Belgium	Chemical processing 40% NSO3 +60%NAOH	API 685 centrifugal pumps	Belgium
2014	Pliva	Pliva Croatia Ltd. - Tapi Croatia	Solvent	Croatia
2014	Siemsa	Oil field in Peru	Gasoline sampling	Peru
2014	Sanofy	Pharmaceutical BRINDISI PLANT	Diclorometano + antibiotico	Italy
2014	Loccioni	Automotive Test For Diesel And Gasoline	Automotive	Italy
2014	Dong Kook Synthetic	Synthetic Fibers Plant	Dowtherm A - 160°C	Korea
2014	Hoechst Marion Roussel	Pharmaceutical PLANT	Methylcyclohexane From (-)100 to +200°C	Germany
2016	Alstom Spa	Cooling systems refrigerant circulation pumps	railway inverter application	Italy
2016	Halon & Refrigerant Services	Refrigerant recycling application	transfer for HFCs HYDROFLUOROCARBONS	UK
2016	Leeson Polyurethanes	Polyurethane foam manufacturer	Transfer of hot oil with trace chemicals at 140 degC	UK
2016	Spirax Sarco	Steam system engineering	Low flow transfer or R134A	UK
2016	Tata Steel	Steel producer	High temperature transfer of organic luquids at a steel works	UK

CERTIFICATIONS



ISO 9001:2015



UKAS



THE DRIVING FORCE IN MAGNETIC SEALLESS PUMPS TECHNOLOGY

Since its foundation in 1978, M Pumps has been the driving force in the design and development in magnetic driven sealless pumps technology. Our unparalleled expertise and unrelenting passion have created a new paradigm in the application of magnetic sealless pumps in the process industry.

Energy Saving, Environmental Friendly, Safety, Performance, Operation reliability, Total Cost of Ownership and pumps system simplification are now available with one supplier only:

M Pumps advanced magnetic sealless pumps and pump systems.

M Pumps with its wide portfolio of products incorporates over 26 designs and 350 basic models allow our engineering department to select the right pump for your exact process requirement. Pre-engineered pumps, highly engineered and special purpose pumps and systems can be tailor-made to meet any demanding operating parameters as required by today's complex processes.

ALL PUMPS MANUFACTURED BY M PUMPS ARE DESIGNED IN FULL ACCORDANCE WITH EXISTING INTERNATIONAL STANDARDS.

- ISO 2858:75, ISO 5199:2002, ISO 1940-1:2007, ISO 3069:2000 certifications ensures compliance with highest quality standards.
- ISO 281-1:2007, ISO 3274:1998, ISO 3661:2011, ISO 7005-1:2011 certifications proves M PUMPS absolute care to the environment.



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