whitepaper

OEM Solutions

calpeda®

OEM solutions

Technology synergy and strategic support for industry

OEM, which stands for **Original Equipment Manufacturer**, manufactures products and components designed to be integrated into more complex systems, thereby becoming an essential part of their operation. In today's industrial environment, characterised by increasing specialisation and constant technological acceleration, the ability of an OEM is measured not only in the quality of the products it supplies, but also in the cooperation it can develop with its partners. In this scenario Calpeda brings all its experience and know-how in fluid handling, maximising the potential of its electric pumps. **Integration, customisation and service**: these are the keywords when it comes to OEMs. The aim is to assist its customers within a continuous and shared technological progress, developing **innovative and customised solutions that can translate into tangible competitive advantages**.

The challenges of the OEM

According to data in the Global Market Insight report, the pump market was valued at USD 85 billion in 2023 and is expected to register a cumulative annual growth rate (CAGR) of more than 4 per cent between now and 2032. Growth factors include rapid industrialisation in emerging economies, which increases demand for pumps and industrial equipment. Infrastructure development requires the use of pumps in various settings, from waste water management to HVAC needs, as well as different manufacturing processes.

Moreover, the **increasing importance of energy efficiency and environmental sustainability** is causing industries to upgrade their systems, directing their research toward innovative pumping systems and increasingly specialised solutions. On the one hand, increasing environmental regulations require industries to adopt more environmentally friendly and energy-efficient technologies. On the other hand, electric pump manufacturers are responding by developing systems that comply with increasingly stringent environmental and energy efficiency standards. The result is a very stimulating dialectic that fosters a dialogue between manufacturers and OEM customers that contributes to sustainable development. Advances in materials science, automation and digitisation result in high-performance pumps with greater energy efficiency, lower maintenance requirements, and improved operational capabilities.

The ideal partner for OEM-based solutions

Calpeda offers a strong expertise in pumping systems designed for integration into industrial plants and machinery.

The OEM world is very broad, with multiple uses for a wide range of sectors. Despite this variety, OEM customers are united by the need for a relationship based on collaboration and co-design.

The partnership that is established goes beyond customer and supplier, both because of its continuity and because the concept of product is replaced by that of **specific solution**. It all starts with listening to the customer's needs. From here, a constant dialogue develops between the respective technical departments to achieve the ideal proposal: one capable of meeting all required specifications and ensuring the best performance. Therefore, nothing is standardised, but rather a tailored solution that takes into consideration different requirements, such as space, performance, fluid type, and working conditions, which inevitably influence the choice of materials and components. **The customisation of products is deeply rooted in Calpeda's DNA, which has always been characterised by its flexibility in adapting its production**.

Alongside **product engineering**, when it comes to OEM applications, the **after-sales support** phase is also fundamental. In industrial contexts, where reliability is a non-negotiable condition, it is crucial to avoid downtime and rely on prompt assistance. This means not only rapid spare parts availability but also possessing in-depth system knowledge to optimise plant operation. This is exactly what Calpeda provides to its customers, thanks to its various service centres and branch offices worldwide.

Source: Global Market insight
https://www.gminsights.com/it/industry-analysis/pumps-market

Sector demands

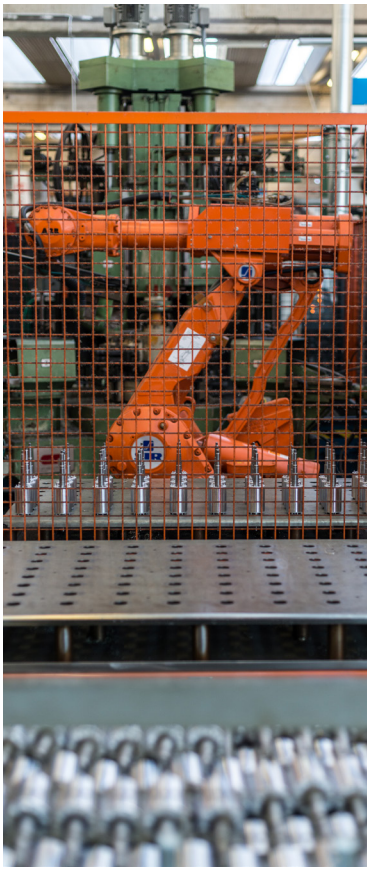
The competitive advantage of cutting-edge technology

Energy efficiency

Pumps integrated into OEM systems are often used in extended or continuous operation cycles. Therefore, energy efficiency is crucial for both environmental sustainability and the reduction of operational costs.
Calpeda's research and development strategy is guided by the pursuit of optimal hydraulic efficiency and the development of high-efficiency motors. At present, significant gain currently comes from the ability to modulate motor rotation speed according to demand. This simplifies plant engineering and cost optimisation. Moreover, a single pump model can cover a broader range of performance, making it possible to supply multiple machines with the same component.

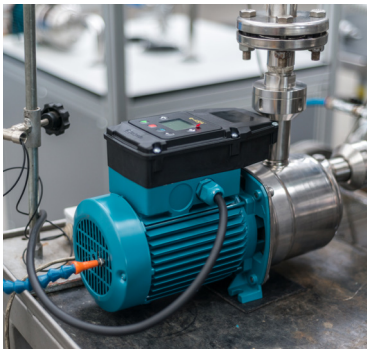
International certifications and standards

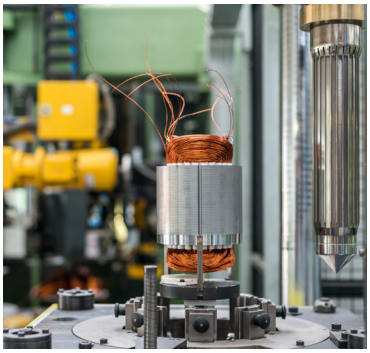
Operating globally, OEM customers face markets driven by diverse and ever-evolving standards. It is therefore essential to rely on a partner capable of offering a broad range of certifications and the design flexibility required to meet various technical and local regulatory requirements. Consistent with its quality policy, Calpeda applies the highest standards across all production processes, extending its commitment to sustainable manufacturing practices. The RoHS directive and REACH regulations are fully observed, including stringent PFAS content controls.

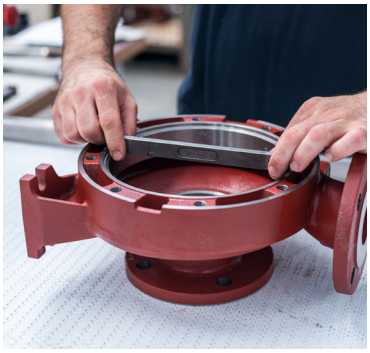


Predictive maintenance and digitalisation (IoT)

With the introduction of on-board electronics, electric pumps have become smart components able to interact with the machine system and collect and relay operational data. Monitoring key parameters is fundamental for predictive maintenance, reducing costs and downtime. Furthermore, there is a trend towards integrating more connected devices to enable effective remote management. Concepts such as digital twins and artificial intelligence opportunities will have an increasingly significant impact on OEM applications.







Settori di applicazione

COOLING systems

Industrial refrigeration systems
Marine sector refrigeration systems
Civil refrigeration systems
Evaporative towers
Data centres

Systems for LUBRICATION, FILTRATION, AND HEATING IN INDUSTRIAL PROCESSES

Machine tools
(tool lubrication)
Machine tools
(process water filtration)
Industrial laundries and boilers

INDUSTRIAL WASHING systems

Food & beverage washing
Mechanical parts washing
Car washes

TEMPERATURE CONTROL systems

Plastic industry presses
Wood industry presses
Ceramic industry kilns

WATER TREATMENT systems

Desalination plants
Reverse osmosis systems
Industrial waste water treatment
Waste water evaporators

Areas of application

Innovative products and specific solutions to optimise systems

COOLING SYSTEMS

This includes industrial and civil chillers, air conditioning and refrigeration systems for the marine sector, evaporative towers, and cooling systems for data centres.
The objective is to provide **advanced solutions designed to ensure efficiency, reliability, and optimal integration.** For this purpose, customisation of seals and impellers is crucial.
These applications generally use a refrigerating fluid (a mixture of water and glycol) that impacts system components, particularly mechanical seals. Hence the need to adapt pumping systems with **dedicated mechanical seals capable of resisting the specific fluid** and ensuring maximum reliability, especially under continuous operating conditions.
Another key aspect is fluid viscosity, which can alter catalogue performance profiles. To ensure efficiency and avoid motor overload, the **impeller diameter** is adjusted to reach the optimal operating point.
Finally, temperature management is critical (whether high or low) especially in outdoor installations. In these cases, it is very important to rely on solutions that use the most durable materials or adopt special measures, such as the use of heating elements to protect the motor windings.

NM - NMS

NMX

C

Cooling systems generally require a good balance between flow rate and head. The **NM and NMS series centrifugal pumps**, available with threaded and flanged connections, are ideal. They perfectly embody the company's DNA, characterised by reliability and customisation options. They are designed and manufactured to ensure long-lasting durability, thanks to product development research and the quality of each component. **The NMX series centrifugal pumps**, made of stamped stainless steel and equipped with threaded connections, are ideal when a machine designed for small chillers is needed and there are no particular requirements concerning temperature and fluids.
In the marine sector, the monobloc centrifugal **pumps with open impellers from the C series are optimal**, especially the version with bronze impeller and pump casing. These pumps are perfectly able to handle both the aggressiveness of seawater used for cooling and the presence of sand and suspended solids. They are versatile and durable pumps, designed for continuous operation and available with various mechanical seal options and materials to best suit operational requirements.

TEMPERATURE CONTROL SYSTEMS

Plastic industry presses, woodworking presses, as well as kilns for the ceramic industry, require precise temperature control to ensure safety, product quality, and efficiency. Pumps play a key role in circulating fluids within temperature regulation circuits, thereby optimising temperature control.

In these cases, customisation of pumping systems focuses on the **materials** of the components, particularly **mechanical seals**. These must be compatible with the fluids and high temperatures involved. Additionally, the systems must integrate easily into existing setups, ensuring a **compact design and standardised connections**, as the pumps are often installed directly into the machine body.

For these applications, **peripheral pumps T and TP** or monobloc centrifugal **pumps from the NMD series are recommended**. The former are ideal when high pressure is required in a small footprint, offering excellent long-term performance and reduced maintenance. However, the latter are characterised by superior robustness but provide lower pressure. Therefore, the choice largely depends on the system's pressure demands.

T - TP

NM - NMD

SYSTEMS FOR LUBRICATION, FILTRATION, AND HEATING IN INDUSTRIAL PROCESSES

Machine tools, such as CNC machines for metalworking, require tool lubrication systems and process water filtration systems. This is to ensure both the proper operation and longevity of the equipment, as well as the quality of the finished product. Pumps must circulate coolant to reduce friction, cool the tool and workpiece, and be integrated into filtration systems to remove contaminants and abrasive particles. To perform these functions effectively, the pumps **must deliver** low flow rate but high pressure. They must also be made from materials and components resistant to high temperatures and abrasion. A **compact** design is also critical, given the limited spaces typical of machine tools, **as well as ease of installation and maintenance**.

For these applications, peripheral **pumps T and TP** are optimal, as they adapt perfectly to pressure and space requirements.

T - TP

OEM solutions for industrial boilers and laundry installations play a central role in ensuring process efficiency and safety. They **must provide excellent flow rate and high pressure** in compact dimensions, be adaptable to **different configurations**, and **offer excellent** resistance by using materials suited to high temperatures and chemically aggressive fluids.

For these uses, **in-line NR series pumps** are ideal as they are known for their robustness and versatility. Their construction makes installation and positioning easy in both new and existing systems. These pumps are also well-suited to creating very compact variable-speed systems, ensuring a high degree of efficiency.

NR

why pumping solutions must be precisely tailored to the project specifications and offer high efficiency.

For these applications, **NM centrifugal pumps and multi-stage pumps from the MXH and MXV series are ideal.** The MXH horizontal monobloc multi-stage pumps in stainless steel feature a particularly compact and robust construction. These are universal pumps, made even more versatile by the wide range of special configurations available on request. They enable the creation of highly efficient variable-speed systems. The MXV vertical multi-stage pumps in stainless steel stand out for their wide operating range, energy efficiency, and simplified maintenance. A particularly advantageous feature is the ability to replace the mechanical seal without having to disassemble the motor. Other key strengths include their compact design and extensive customisation options.

WATER TREATMENT SYSTEMS

The treatment of waste water generated by civil and industrial activities, its recovery for reuse through contaminant separation, and its desalination and purification via reverse osmosis systems: in all these applications (which are essential to the sustainable management of water resources), pumps can make a significant difference by ensuring **optimal performance and reduced operating costs**.
In osmosis processes, pumps must **deliver particularly high pressure** to ensure effective separation. In addition, corrosion-resistant materials, such as **AISI 316** stainless steel, are required for all parts in contact with water.

INDUSTRIAL WASHING PLANTS

These systems are designed for the automated cleaning of components, equipment, and containers used in various sectors, including the automotive, food, chemical, and pharmaceutical industries. In this context, pumping solutions must provide **adequate pressure** and **flow rate** to effectively remove contaminants. They must also use **durable materials** capable of withstanding aggressive fluids and high temperatures. Material selection is also influenced by specific application requirements. For example, stainless steel is preferred for its hygienic properties in managing industrial processes in the pharmaceutical and food & beverage sectors.

MXV

MXH

NM

In wastewater treatment plants, handling effluent requires the capacity to manage **large flow rates**. The presence of **heavily loaded effluents** with suspended solids demands special attention to impeller design. In all cases, water treatment is an energy-intensive activity, which is

When large flow rates need to be handled, **NM series centrifugal pumps** are ideal. If very high pressure is required instead, **MXV or MXH multi-stage pumps** are the preferred choice.

Customised solutions

Integrated engineering and logistics support

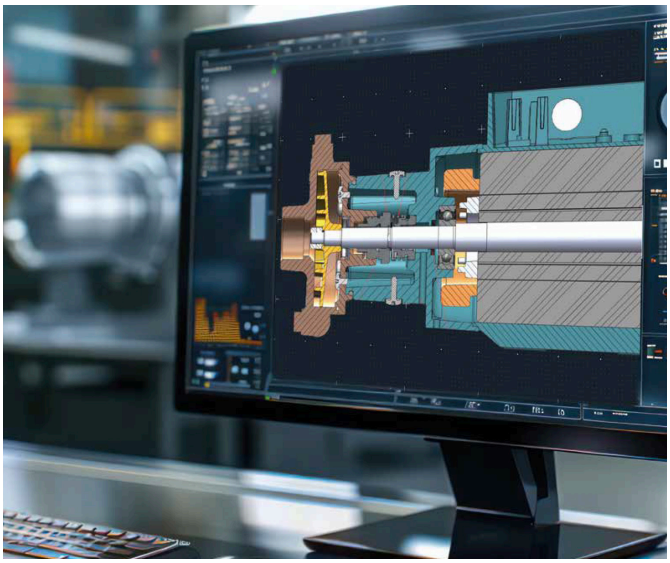
Customisation for OEM solutions is an integrated process in which every element (from construction materials to mechanical and electrical configurations) is selected to meet specific operational needs and ensure efficiency, reliability, and long service life.

Materials must be tailored to each application, both for the wet end and the shaft. This is to ensure compatibility with the fluids being pumped and the operating conditions. For example, steel is preferable to cast iron for corrosive fluids, while bronze is ideal for marine applications.
The chemical and thermal compatibility with the fluid determines the choice of the mechanical seal. This is a delicate yet crucial component that is also particularly prone to wear. Materials such as silicon carbide, carbon graphite, and ceramic, along with EPDM or FPM seals, offer various combinations of corrosion and abrasion resistance. This makes it possible to pump special liquids safely and reliably.
Customisation also means **optimising impellers to improve energy efficiency** and reduce component wear. The impeller is the functional heart of an electric pump. Ensuring optimal performance and a long service life requires considering the specific application and selecting the most suitable solution. Customisation can involve selecting the most suitable material (cast iron, bronze, or stainless steel), but it is also possible to adjust the diameter to shape the impeller according to the desired operating point.

It is essential to have motors available in various voltages and safety standards, or with special options such as tropicalisation, AISI 316 L shafts, anti-condensation heaters, PTC sensors, and sealed bearings. All this to ensure reliable performance in challenging environments.

Customisation also means **redesigning and prototyping for special projects**.
In OEM solutions, the customer and the manufacturer become part of the same team. Calpeda offers its expertise through a redesign service that makes it possible to revise existing products by introducing modifications aimed at making them suitable for the specific project requirements. This process extends beyond simple variations: it includes entirely new design solutions, all developed while meeting customer timelines. This is thanks to fully in-house production and a wide semi-finished products availability in stock.
Product quality and reliability are confirmed through end-

Calpeda's support to OEM customers is complete, from the initial co-design phase to optimal operation in the final application, and on to international after-sales service.



of-line testing of every unit and a state-of-the-art test facility of over 1,000 m². Here, the most advanced, application-specific, and endurance tests are conducted, along with the development of new solutions that meet customer needs and drive product innovation.
The test room is a critical component in developing specific solutions. It enables functional tests on pumps and motors to evaluate quality standards, assess performance, and ensure correct operation, simulating extended use or extreme conditions.

Calpeda's support embraces the entire life cycle of the system: from initial technical analysis to understand application-specific requirements, to joint design and validation through advanced testing. **After-sales support is global**, delivered through specialised service centres, a worldwide spare parts network, and a range of dedicated training programmes.
This comprehensive approach allows Calpeda to work alongside OEM partners at every phase of the project, ensuring operational continuity, efficiency, and long-term value.

PRODUCT CERTIFICATIONS

SYSTEM CERTIFICATIONS

calpeda®

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