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SULZER

Sulzer Pumps

The World Leader in Specialist Pumps for the Oil & Gas Industry



The Heart of Your Process



Sulzer Pumps – World leader in Oil & Gas pump applications

Expertise to meet your present and future needs.

Expertise

Sulzer Pumps success in Oil & Gas is based on its unique ability to push back technical barriers and provide reliable high quality equipment. This is achieved by the fundamental principles nurtured over a century of the

corporations existence to develop the world's finest engineers in their respective fields. This experience is the key thread throughout the Oil & Gas disciplines within Sulzer Pumps from the concept phase through to design, manufacture, testing installation and reliable operational support.

Reliability

Sulzer Pumps' reliability in Oil & Gas applications is renowned across the world. Should this be production, pipeline, LNG or any other upstream process, Sulzer pumps products reputation for first time start-ups, availability, reliability and ease of maintenance receives frequent compliments from our clients.

Sulzer Pumps' ground breaking technology led to the worlds first 40,000 hour life guarantee on a high energy injection pump being given and then achieved in operation. With over 1,000 MW installed power and more than 1,000,000 operating hours, Sulzer HPcp pumps deliver 99% availability for their operators.

Your competitive edge through our reliable solutions.

Research & Innovation

Sulzer Pumps continues to create world records in the Oil & Gas business and our list of firsts is un-equaled. Having produced the world's most powerful centrifugal barrel pumps in the 1980's we broke our own record in 2004 by 50% with injection pumps supplied reaching 27MW drive power. We also achieved a similar feat on the world's high-

est pressure centrifugal barrel pumps between the 1980s and 2003, with injection pumps supplied reaching 605 bar discharge pressure and designs available up to 750 bar. Add to this the world's highest pressure axially split injection pump, the world's

Our R&D secures your future production.

largest multiphase pumps and LNG send out pumps as further examples and it is clear Sulzer is the leading pump supplier in terms of product development.

Presence

Sulzer Pumps has 13 manufacturing plants located around the globe, over 55 service centers and numerous regional locations to support our customers from the first exploration and FEED stage through to operations, retrofits and upgrades. Our core aspiration is making our customers more competitive and our global presence and culture facilitates this.

Global reach backed up by local support.



A number of our manufacturing facilities are particularly focused on the needs of the Oil & Gas industry. All aspects of the manufacturing process are tailored to the industries exacting demands from material traceability and procedure qualification through to project management, full string testing and field commissioning.

Future

New oil deposits are being found in ever more aggressive or remote environments. The ongoing need for increased pressures and flow rates in injection applications coupled with remote and underdeveloped production locations makes pump reliability critical to the success of the entire investment. In addition, long pipelines are often required in order to transport crude oil to shipping ports or refining centers. Remote, unmanned pumping stations must therefore operate reliably for extended periods of time if excessive maintenance costs and capacity restrictions are to be avoided. Sulzer Pumps are committed to continuously developing their products to meet these challenges while still maintaining the legendary reliability of their equipment.

**Investing
in the future
of our
customers.**

SULZER FIRSTS

1975

World's first duplex injection pumps.
Sonatrach – Algeria – 13 units

1977

World's largest injection pumps.
Saudi Aramco - 15.7 MW - 2 units

1981

World's largest injection pumps.
Sohio – Alaska – 18.8 MW – 2 units

1984

World's largest offshore injection pump.
Zadco - Abu Dhabi - 14.2 MW - 1 unit

1992

World's largest vertical injection pumps.
Statoil - Norway - 6.7 MW - 2 units

1994

World's largest LNG send out pumps.
Botas - Turkey - 2,121 m - 5 units

1999

World's largest offshore multiphase pumps.
Total - UK North Sea - 4.5 MW - 2 units

2000

World's largest multiphase pumps.
Yukos Oil - Siberia - 6.0 MW - 2 units

2001

World's highest pressure injection pumps.
BP - Gulf of Mexico - 605 Bar - 4 units

2002

World's largest injection pumps.
AIOC – Caspian Sea – 27 MW – 4 units



The answer to your process needs

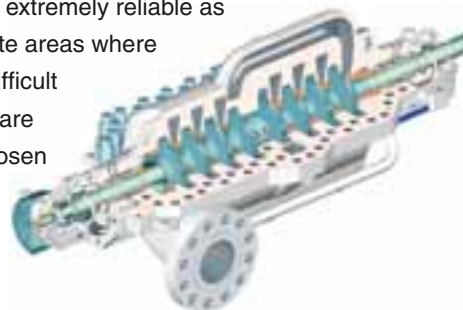
Oil Production

Oil production has always relied on efficient, reliable pumps for injection, MOL, seawater lift, firefighting and associated auxiliary applications. As the search for oil leads to the development of ever more extreme fields in terms of offshore depth or geographical remoteness, the pumps selected become critical to the fields practical operation and viability. Sulzer Pumps reputation is second to none for delivering ground braking designs that keep the 'state of the art' ahead of the demands of these new developments.



Pipelines

Transporting crude oil or refined products in pipelines across continents from the production centers to market is a key part of the modern world's energy distribution infrastructure. Indeed, as existing production 'local' to users decline, new fields need 'tapping in' to the market by way of new pipelines. Pumps for pipeline applications must not only be efficient to minimize energy consumption but extremely reliable as they are often located in remote areas where routine maintenance is both difficult and expensive. Sulzer pumps are installed all over the world, chosen by operators who know they can rely on them to reliably maintain their pipelines at full flow.





Gas

Gas production, and in particular LNG, is expanding at a rapid rate. Producing LNG is an ideal way of maximizing the return of a field while at the same time making a positive environmental impact through reduced flaring. Once processed, the LNG can be economically shipped around the world in purpose built tankers to industrialized regions for consumption.

With a range of cryogenic pumps suitable for pumping LNG, Sulzer specialize building in the critical high pressure 'send out' pumps used to load the tankers.



Multiphase

Multiphase pumping is an effective way of boosting the unprocessed gas/liquid mixture produced by a well. Development of this technology has led to the successful development of more marginal fields at minimum cost. Multiphase pumps are an effective way of transporting the output to existing infrastructure for separation and onward long distance transportation. Sulzer helico-axial MPP pumps are used at the heart of such developments and currently represent the largest onshore and offshore multiphase installations in the world.





The world's best production and testing facilities

UK facility

The UK facility in Leeds specializes in building and packaging highly engineered pumps for the Oil & Gas market. With a purpose-built factory and offices opened in 1981 for the dedicated production of centrifugal pumps, some of the world's largest and most powerful pumps have been designed, manufactured, packaged and tested here for customers on all continents. Extensive facilities ensure the highest quality production from design and machining through to assembly and testing. The latest investment at this site is a 30MW GT drive pump string test facility. The best of its kind in the world.



USA facility

The USA facility located in Portland (OR) is a producer of engineered pumps focusing on the Oil & Gas production and hydrocarbon processing markets. This large facility contains state of the art manufacturing processes and machines for producing multistage axially split pumps. Internationally recognized as one of the world's leading suppliers to the petroleum industry Sulzer Pumps USA operates many strategic alliances with major oil companies for the supply of new pumps and after sales services.





Brazil facility

Our Sao Paulo facility is a modern purpose built factory including the largest pump test facility in the south hemisphere. The plant focuses on the supply of a wide range of engineered and standard pumps both the South American market and other Sulzer group companies. In addition to the main factory we also have our own foundry (Fundinox) which supplies castings throughout the Sulzer pump division. Key markets include offshore Oil & Gas production, hydrocarbon processing plus water and waste water projects.



Abilities and testing (including gas turbine drive)

Sulzer Pumps manufacturing plants all have excellent testing facilities, capable of demonstrating the pump performance required and proving much of the ancillary equipment to ensure a smoother commissioning and start-up. One example is our unique in house gas turbine string testing capabilities. Having supplied hundreds of gas turbine driven pumps, Sulzer are aware of the need to prove the full train prior to dispatch and have the capability to undertake string testing with GT drivers up to 30MW within our own manufacturing environment. Our existing capability to string test electric motor, VFD, diesel & gas engine trains also allows testing which provides a high level of comfort to our clients.

Packaging and project management

Sulzer's experience from its corporate background in rotating equipment has resulted in our ability to provide high quality packages, project managed by a global team who understand the importance of customer relationships. Whilst every project in itself is managed professionally we also aim to ensure there is a continuous improvement process which reflects the needs of today's Oil & Gas market. As the challenges grow in terms of technical, geographical, environmental or any other aspects you can be sure of Sulzer's support.



Pumps for your most critical applications

HPcp/HPcpV – Record Breaking Injection and MOL Pumps

HPcp API 610 BB5 radially split barrel pumps are used for injection and main oil



line services. Using the Sulzer Twist-lock system of barrel closure to minimize weight, these pumps represent the state-of-the-art for upstream high-energy pumps. They are available in both horizontal and vertical configuration. The world's largest onshore, offshore, highest pressure and vertical injection pumps are all HPcp designs.

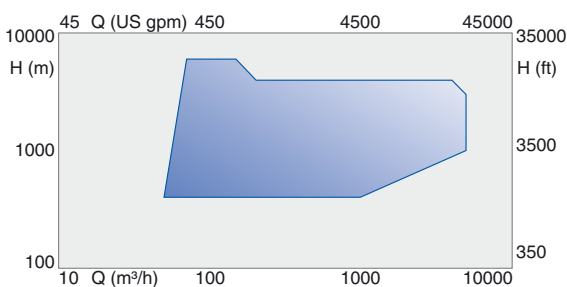
GSG – Standard Injection and MOL Pumps

GSG API 610 BB5 radially split barrel casing pumps are used in oil production for injection and MOL ap-



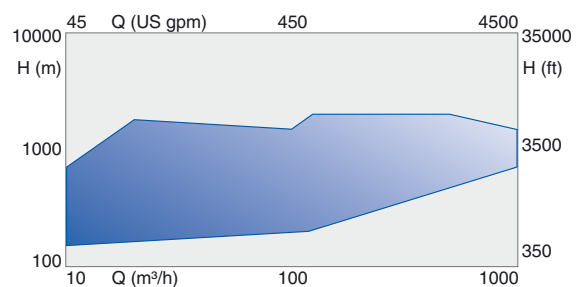
plications. Their design is optimized for synchronous speed direct drive applications thus avoiding unnecessary and expensive construction features. Their full cartridge design makes the most of the compact Sulzer Twistlock system of barrel closure. A back-to-back low flow high pressure option is also available.

Performance range



Pressure 600 bar / 8700 psi
Temperature 90 °C / 195 °F

Performance range



Pressure 250 bar / 3625 psi
Temperature 425 °C / 800 °F



CP – Volute Barrel Pumps

CP API 610 BB5 axially split barrel casing pumps are used in oil production for injection and MOL applications. The axially split inner case make removal of the complete rotor for maintenance a simple procedure. They are particularly suited to low specific gravity applications where the back-to-back design and center bush provide natural axial balance and additional shaft support. These pumps also utilize the Sulzer Twistlock design for the casing cover.

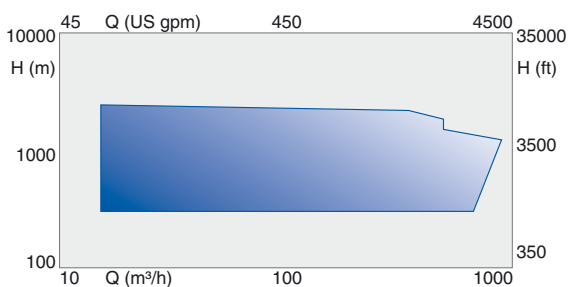


MPP – Multiphase Pumps

MPP helico-axial multiphase pumps are spearheading a revolution in oil and gas production. The pumps are able to operate with high gas fractions thus removing the need for separation systems. The world's largest onshore and offshore multiphase installations are Sulzer MPP designs.

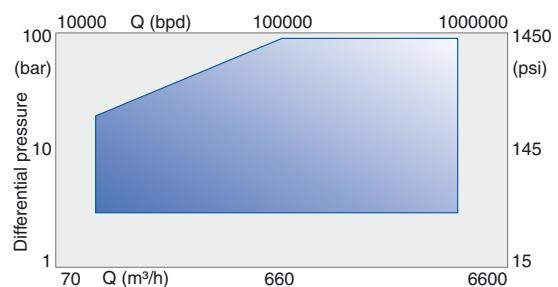


Performance range



Pressure 410 bar / 6000 psi
Temperature 425 °C / 800 °F

Performance range



Pressure 150 bar / 2175 psi
Temperature 175 °C / 350 °F



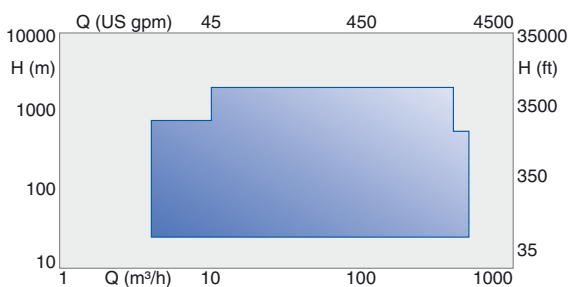
VCR – LNG Loading and Low NPSHa Pumps

These API 610 VS7 design multistage canned pumps are used where NPSH available is limited. A



wide range of hydraulics, discharge headgear and pressure ratings may be supplied depending on individual application requirements. For cryogenic applications a low temperature seal system (J unit) is also available.

Performance range



Pressure 30 bar / 435 psi
Temperature 160 °C / 320 °F

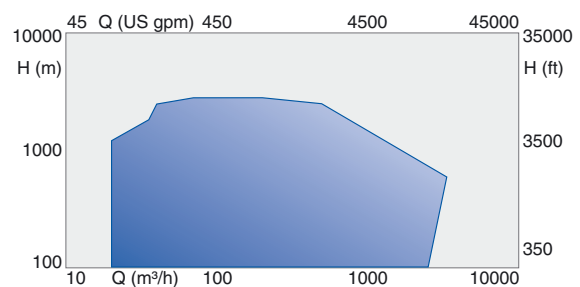
MSD – Axial Split Injection and Pipeline Pumps

MSD API 610 BB3 multistage pumps are widely used in pipelines and water injection applications.

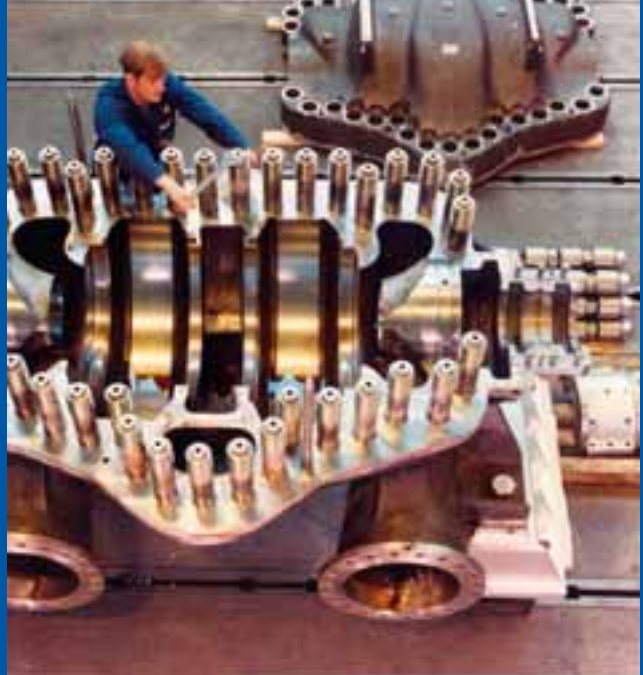


The broad range of standard hydraulics and mechanical design options ensure an optimum fit to customers duty requirements, using proven pre-engineered solutions.

Performance range



Pressure 310 bar / 4500 psi
Temperature 200 °C / 400 °F



HSB – HP Pipeline Pumps

HSB API 610 BB1 double suction axial split pumps are designed for use in pipeline and general heavy duty auxiliary applications. Their robust design is suitable for both synchronous and high-speed operation.

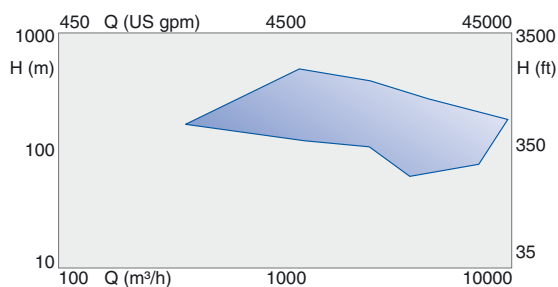


HPDM – High Flow/Head Pipeline Pumps

HPDM multistage axially split pumps are designed for high volume, high-pressure transport applications. HPDM pumps are individually designed to provide class-leading efficiency and are used to supply water for arid area inland injection applications as well as main pipeline pumps.

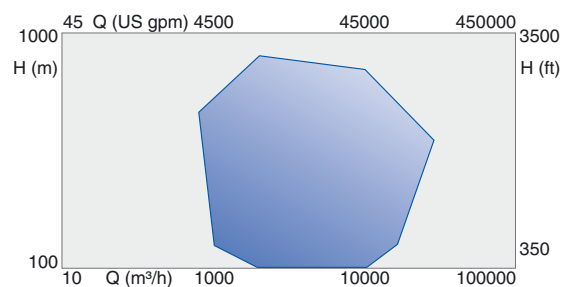


Performance range



Pressure 30 bar / 435 psi
Temperature 160 °C / 320 °F

Performance range



Pressure 150 bar / 2200 psi
Temperature 90 °C / 195 °F



SMN – Auxiliary Pumps

The SMH API 610 BB1 compliant design is used for boosting, transfer, firefighting and low pressure auxiliary applications. The pre-engineered range provides robust design options specifically intended for upstream applications.

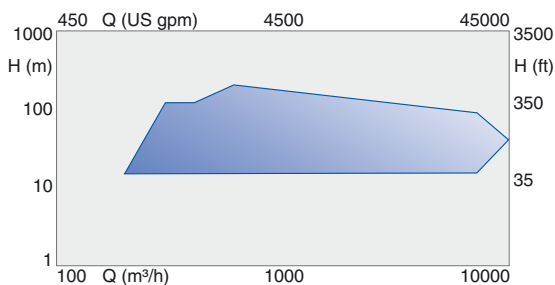


OHH – Modular Process Pumps

OHH API 610 OH2 pumps are designed for process and boosting applications. The pump already meets the requirements of the latest generation of API and ISO standards. Key to the design is the widest hydraulic performance coverage on the market coupled with the smallest size steps. This means better quality selections no matter what the duty.

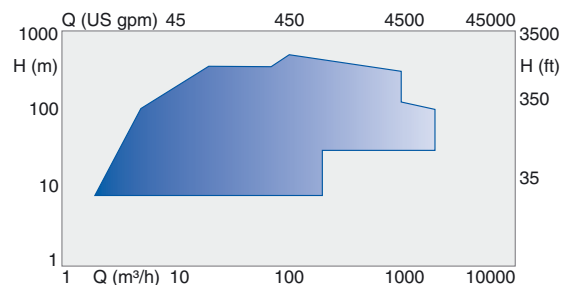


Performance range



Pressure 30 bar / 435 psi
Temperature 160 °C / 320 °F

Performance range



Pressure 50 bar / 725 psi
Temperature 425 °C / 800 °F



BBS – Heavy Duty Process Pumps

BBS API 610 pumps are primarily used in auxiliary process and booster applications. The broad pressure and temperature capabilities of this design allow it to be used in the most arduous situations while still providing long and trouble free service. The double entry impeller is particularly suited to low NPSHA duties.

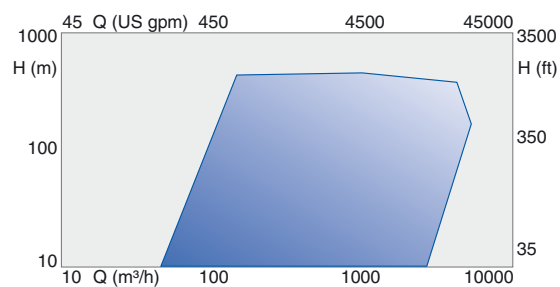


BBT/BBT-D – Two Stage Process Pumps

These API 610 BB2 back-to-back two stage pumps are designed for process applications where higher heads are required. The design features large seal chambers able to accommodate API 682 seals. Standard options include a double entry suction option for low NPSHA duties in the BBT-D.

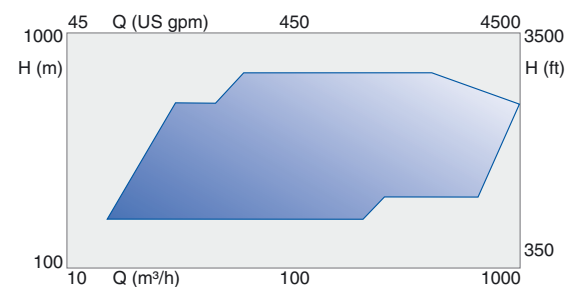


Performance range



Pressure 100 bar / 1450 psi
Temperature 425 °C / 800 °F

Performance range



Pressure 100 bar / 1450 psi
Temperature 450 °C / 840 °F

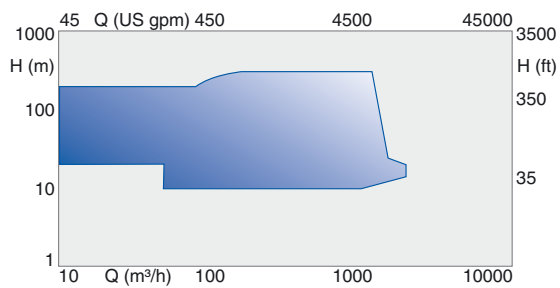


SJ Series – Vertical Line Shaft Pumps

The SJT, SJM and SJP range of vertical line shaft pumps are primarily used in water lift, transfer and cooling water applications. A double suction variant is used where NPSH is limited as is a canned version, the SJD. API 610 VSI, VS2, VS3 and VS6 configurations are available.



Performance range



Pressure 30 bar / 435 psi
 Temperature 160 °C / 320 °F



Maintaining and improving pump performance

Sulzer Pumps – Customer Support Service

The continuous availability and high operating performance of pumps is the key target for our customer support service organization. Through our highly experienced personnel and application knowledge, we provide a full range of innovative service solutions to our customers to keep their pumps running including;

- Spare Parts
- Field Service
- Repair Services
- Retrofits
- Maintenance Agreements
- Operation Agreements

Flexibility

With services ranging in scope from supplying a spare part to operating the pump under contract, we are uniquely placed to make your process run smoother. A dedicated team of CSS specialists based at either our manufacturing facilities or one of over 50 service centers located around the world is dedicated to maintaining the performance of our customers pumps and associated equipment. This service is not just limited to Sulzer products, all the pumps our customers operate can benefit from the support of Sulzer CSS specialists.

Network of Locations

- Divisional Headquarters
- Manufacturing Facility
- Customer Support Service Center (CSS)
- Sales Office



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