

High pressure solutions

### The plunger pump: The heart of all applications

Plunger pumps function in principle like a heart: A chamber increases in volume when fluid is sucked in and then it decreases in volume when the fluid is pressed out – a simple and effective system. In the case of a plunger pump the chamber is actually a cylinder and the variation in volume is effected by a piston, called a plunger, driven by a shaft. The direction of flow is governed by check valves, allowing the cylinder to be filled and emptied.

Plunger pumps are of low-complex design and require a minimum of space; nevertheless they achieve high rates of efficiency. Just like a heart, plunger pumps have to perform reliably und perpetually. The modular design allows material selection to suit the particular application and the pump performance characteristics. Comparable to the beat of a heart, our pumps pulsate in an exact rhythm. Further advantages of this type of pump are simplicity in operation and easy maintenance so that even semi-skilled workers can handle the pump system confidently after a short training period.

#### Finding individual high pressure solutions

Competence in high pressure technology is our main target: KAMAT has built up its reputation over decades as being a leading international supplier of high pressure technology systems for pumping fluids. But that is no reason for us to rest on our laurels! Success stories of yesterday are not the message our customers want to hear – our job is to meet the new market requirements of today and tomorrow. We are keen to accept the challenge and prove our strength by assessing the task to be performed, developing ideas and then implementing the solution at full blast - that means with high pressure.

What does "high pressure" mean? There are two answers to that question: First of all, high pressure is the technology of generating pressures up to 4000 bar for even the most difficult application. In a figurative sense it also represents the way we tackle every new challenge, with energy and enthusiasm. How do we ensure such "high pressure performance" in every case? By listening to what our customer has to say. A proper understanding of the customer's problem is the basis for finding the perfect solution. The heart of each solution is a powerful high pressure pump, selected from a wide range of possible performances. Flexibility is just one of our strong points: The types of machine available range from high pressure units for cleaning jobs to individually designed machines for special applications in a variety of industries worldwide.

Our company headquarters are located in Witten, a town in the centre of the Ruhr area. Our highly qualified and motivated engineers and production staff take pride in designing and manufacturing high-quality products which our customers can fully rely on. Such quality is not left to chance: Our Quality Management system is certified according to EN ISO 9001:2000 in all aspects such as development, construction, manufacturing, sales and distribution.



Applications

04–11

High pressure pumps



14–15

12–13

16–17



KAMAT worldwide

18–19



# Targeted use of water as a powerful tool

"Constant dripping wears away the stone" - we have "accelerated" the idea selective and ecologically-friendly process. By pressurising water at high speed, a water jet is generated which, on impact, can be used to clean

The pressure selected depends on the job to be done. For simple surface cleaning very often a pressure of 300 bar is suffi cient for good results. how long it takes to do the job. Thanks to a modular component system and fl exibility in design features, KAMAT is always able to provide the right pump for each and every jetting application.





# Waterjet technology: Definitely clean

removed completely without damaging into a dirty-water tank. Just a further the surface. Provided the right high pressure system is used, even hard damage. The technology can equally from large surface areas; again, the

successfully performed is the effective runway cleaning of international runway is taken off using the high pressure water technology. We install bar in a special-purpose vehicle.

Using a cleaning tool specifically example to show how KAMAT plays an important role in improving safety

#### Here are some typical jetting applications:

- Paint removal
- Rust removal
- Removal of rubber
- Runway cleaning
- Removal of road markings
- Heat exchanger cleaning
- Drain cleaning
- Cold cutting
- Concrete renovation
- Deburring
- Decoring

- | 1 Runway cleaner
- | 2 Surface cleaner with vacuum device



# Achieving a surface finish of WJ-1 at 3500 bar

But this is not the end to the story: KAMAT high pressure technology is the answer to many cleaning problems which arise in industrial manufacturing processes. For example, cleaning casting moulds, removing casting residues from work pieces, or burrs remaining after machining, even in areas difficult to reach. For many years, the technology has been successfully implemented in the marine industry, where rust, paint and maritime growth are removed from ship surfaces. Using pressures of up to 3500 bar, it is possible to achieve the cleaning grade of WJ-1, today's highest internationally-recognised standard for surface preparation.







# Taking care of material and environment

Special care needs to be taken when working in various branches of industry, for instance in the construction industry. The jetting technology is vibration-free and without any negative thermal effects. Deteriorated concrete can be removed from the surface of buildings while derusting the reinforcement bars at the same time, without inducing vibrations which might damage the structure itself

Just how flexible the technology can be is shown in the method of pipe cleaning by high pressure water. Even cleaning round bends and elbows in fully blocked pipes is unproblematic. There is never any dust hazard to burden the environment. And polluted water can simply be recycled, thus reducing the amount of water to be disposed of and keeping down the costs of the technique.

The range of possible applications for the KAMAT water jet technology is virtually unlimited. You, the customer, dictate the requirements. We, KAMAT, supply a custom-built system to match your individual needs.

#### A small selection of shipyards where the KAMAT high pressure technology is employed:

- Genoa
- Naples
- Malta
- Great Yarmouth
- Piraeus
- Stavanger
- Bergen
- Constanta
- Aalborg
- Sharjah
- Dubai
- Singapore
- Rio de Janeiro

- | 1 Semiautomatic shiphull cleaning
- | 2 Manual paint removal
- | 3 Bauxite incrustations
- | 4 Pipe cleaning



# Safe pumping of corrosive, abrasive and volatile fluids

problem: He needs to pump 23 lpm application 24h per day, 365 days per system for process pumps makes it feed pumps and a typical field of use is in the chemical and petrochemical advantage of being able to safely volatile and multiphase media can these are manufactured to a high

package solution or as a single pump, the KAMAT pump fulfils the demands cooling circuits and heating devices.





# Unique solutions

pumps for chemical applications is cost-effective material selection for the medium. Almost all components department cooperates closely with for tasks which previously were not plunger pump provides a sensible

compact design offers considerable

#### Application examples in the chemical industry:

- High pressure homogenisation
- up to 3500 bar
- Methanol injection - Glycol injection
- Reverse osmosis
- Gas washing plants
- Polyol pressing
- Crude oil injection
- Fuel injection

- | 1 Chemical laboratory
- | 2 Process pump



# High power and precise impact

Flexibility is one of our strong points: KAMAT is equally at home in the generate power and transfer it via installations. KAMAT high pressure









# Water power to rely on

to developing water-hydraulic systems for many industries where ecological priority. The power of water is bridges are application areas where inshore waters. Probably the biggest market for water hydraulics constitute underground coal mines; apart from the ecological aspects, high pressure since the safety of the mine workers is segment of mining technology. on hydraulic presses and forges – as

are continually developing the A special feature, designed and

#### Here are just some reference locations where KAMAT hydraulic pumps are in service:

- Shenhua International / China
- BHP Billiton / Australia
- Consol Energy / USA
- Jim Walter Resources / USA
- Foundation Coal / USA
- DSK / Germany
- Park Termik / Turkey
- Voestalpine Grobblech / Austria
- Voestalpine Schiene / Austria
- Welspun / India
- Servercorr / USA
- Bhilai Steel / India

- | 1 Hydraulic press
- | 2 Descaling
- 3 Mining pump
- | 4 Coal production (Photo: Deutsche Steinkohle AG, www.deutsche-steinkohle.de)







# Modular construction for optimal products

KAMAT plunger pumps with integrated gear reductions generate pressure for

due to a high degree of modularity. A particular advantage when it comes to manufacturing components for special applications where the media or thermal

Simply by exchanging the plunger conversion kit, the pump operating data and and equipped with a reliable lubrication system. All pumps can be supplied

# Rugged design up to 800 kW for continuous duty

KAMAT can supply pumps for every selected from anywhere between dilutions, media with solids and media whereby the gear ratio and drive speeds can be configured to suit

### Pump type

K 108 K 4500 K 8000 K 9000 K 10000-3G K 11000-3G K 13000-3G K 16000-3G K 20000-3G K 25000-3G K 35000-3G K 40000-3G K 50000-5G K 80000-5G

p max. kW	Q max. I/min.	p max. bar
15	4	2000
45	232	2100
75	283	2950
90	283	3100
130	449	3500
110	454	1500
130	496	1500
160	522	1500
200	957	2800
250	1148	3200
350	1310	3500
400	1310	3500
530	1913	3500
800	2182	3500



# From the first idea to the ready-to-operate system

We set our own high standards: Only the best solution for each client is good enough. The emphasis is on the word "solution"- but what does that mean in practice? It means supplying complete custom-built solutions, each one confi gured specifi cally for the individual requirements. At the heart of each high pressure system there is the KAMAT high pressure pump. Our engineering expertise is not limited to the high pressure pump itself. Our customers benefi t from our comprehensive technical knowledge: The scope of supply supplementary to the high pressure pump includes different types of drive systems, power transmissions, PLC controls, monitoring devices, data transfer, remote-control, pneumatic or electric valve control, mobile assemblies and sound-proof installations. From the very beginning, we accompany our customer through all stages of implementing the project, right up to the fi nal ready-to-operate system.

Complete KAMAT systems are supplied for many applications, including cleaning technology, pressure testing, longwall mining and water hydraulics. All systems are individually designed to meet customer specifi cations. Whether for special fl uids or exceptional locations, KAMAT engineers can provide the answer. Units are available for operation in hazardous locations such as underground mining and offshore applications. Individual software and project-oriented control systems are also provided by KAMAT.





# Filter technology – high performance components for a clean environment

KAMAT is also strong in new technologies – we have developed our own range of special filters. Why does a pump manufacturer get involved in filter technology? The answer is simple: The high pressure cleaning technology using water as an environmentally-friendly medium calls for a high grade of filtration and recycling. Since such sophisticated filters were not readily available in the market, KAMAT decided to design its own range of filters in response to individual requests and we can now supply filters which withstand pressures of up to 4000 bar, as well as filters for water recycling systems in cleaning technology. If required, we can take over the installation and start-up on site.

| 1 Mobile diesel driven unit

| 2 Stationary electrically driven pump unit



# Valves for every purpose

To run reliably long-term, a plunger pump must be protected by intact and effi cient valves. KAMAT engineers have designed and continue to develop a wide range of valve types for all performance

#### Special valves for complex processes

For instance, KAMAT has designed a valve particularly for the process of pipeline testing in the petrochemical industry. In this process, the high pressure pipes are extremely large and thin walled: are also available for testing gas tanks strengthened with carbon fi bres, commonly found in the

# Water tools high pressure accessories for surface preparation

In order to achieve best results with water when treating surfaces, the water jet must be precisely guided and this can best be done using specially-designed accessories. KAMAT has an extensive range of devices of our own manufacture, including high pressure guns with mechanical function or electrical operation. Our own rotating nozzles produce coherent jets that can be directed at large surfaces precisely and speedily. We also supply externally-driven rotating tools that utilise the hydraulic energy to an optimum and clean the surface perfectly.

#### Vacuum-supported solutions

Sometimes an O.E.M. requires high pressure accessories to supplement his own equipment. A typical innovation is a special system developed by KAMAT for vacuum suction of debris removed in the process of cleaning large areas. The used water is recycled and returned to the system after fi Itration. Solutions of this nature are planned and implemented in close liaison with the client. In many cases, the major component of such a special tool is a high pressure rotating joint; this component can also be supplied on its own.

- | 1 Electro hydraulic unloading valve
- | 2 Electro hydraulic 2/2-way valve DN8 max. 3000 bar
- | 3 Pneumatic 2/2-way valve max. 3500 bar
- | 4 Pneumatic pressure regulator
- | 5 UHP gun with pneumatically driven lance
- | 6 UHP gun with Remote Control
- | 7 Pneumatically driven Rotary Nozzle
- 8 Rotary Nozzle



KAMAT sells its products and services all over the world, with 80% export turnover. Apart from the European markets, international markets account for a large share of export business. In nearly all countries where customers are using KAMAT products there are local representatives or dealers who provide a comprehensive service and who are responsible for important matters like after-sales service, technical support and prompt spare parts supply.

Whenever more intensive support for special projects is required, KAMAT engineers from the main location in Germany provide additional assistance and support to our local agents, to ensure that the end user benefits from the best possible service. Training programmes can be carried out locally or at the company premises in Witten. KAMAT considers it as essential that sales distribution and service are upheld at a high level.





 KAMAT premises, Witten
Modern CNC machines for highest manufacturing quality

Our sales organisation – service and technical support on a worldwide basis						
Argentina	Denmark	Kuwait	Saudi Arabia			
Australia	Finland	Macedonia	Serbia			
Austria	France	Malaysia	Singapore			
Bahrain	Great Britain	Mexico	Slovenia			
Belarus	Hong Kong	Montenegro	South Africa			
Belgium	Hungary	Netherlands	Spain			
Bosnia & Herzegowina	India	Norway	Sweden			
Brazil	Indonesia	Oman	Taiwan			
Canada	Israel	Pakistan	Turkey			
Chile	Italy	Poland	U.A.E.			
China	Japan	Qatar	Ukraine			
Croatia	Kazakhstan	Romania	USA			
Czechia	Korea	Russia	Vietnam			

We cooperate closely with many companies on an international basis that are engaged in building equipment of their own and who use KAMAT products to complement their own high pressure units. In many cases, such companies are appointed as KAMAT representatives and they are reliable partners who promote the name of KAMAT in their local markets.

