



**RUHRPUMPEN**

*Specialist for Pumping Technology*

## ***Gas Shale Fracturing – Centrifugal pumps***

**Ruhrpumpen Group**

**11th of June 2010**

**Ian James – Engineering Manager, Tulsa, OK**

**Rob Keij – Marketing Manager**



# **AGENDA**

- ? Company profile Ruhrpumpen**
- ? Ruhrpumpen Pump portfolio**
- ? Applications within Gas Shale Cracking**
- ? Contact**



## Ruhrpumpen Germany, Witten

Company profile



**Employees: 238**

**Area: 517,000 ft<sup>2</sup>**

**Testing: 9,387 Hp**  
(soon 13,400 Hp available)



## Ruhrpumpen Mexico, Monterrey

Company profile



**Employees: 402**

**Area: 155,000 ft<sup>2</sup>**

**Testing: 7,500 Hp**



**Employees: 216**

**Area: 301,000 ft<sup>2</sup>**

**Testing: 2,000 Hp**

## **Ruhrpumpen Egypt, Cairo**

Company profile



**Employees: 36**

**Area: 25,540 ft<sup>2</sup>**

**Testing: 2,680 Hp**

**(Test facility in construction)**



# Ruhrpumpen Diversified Client Base

Company profile



Bayer



VALERO ENERGY CORPORATION



JACOBS

KVÆRNER

Uhde



Linde



Ferrostaal



Sinopec Corp.

CHINA PETROLEUM & CHEMICAL CORPORATION

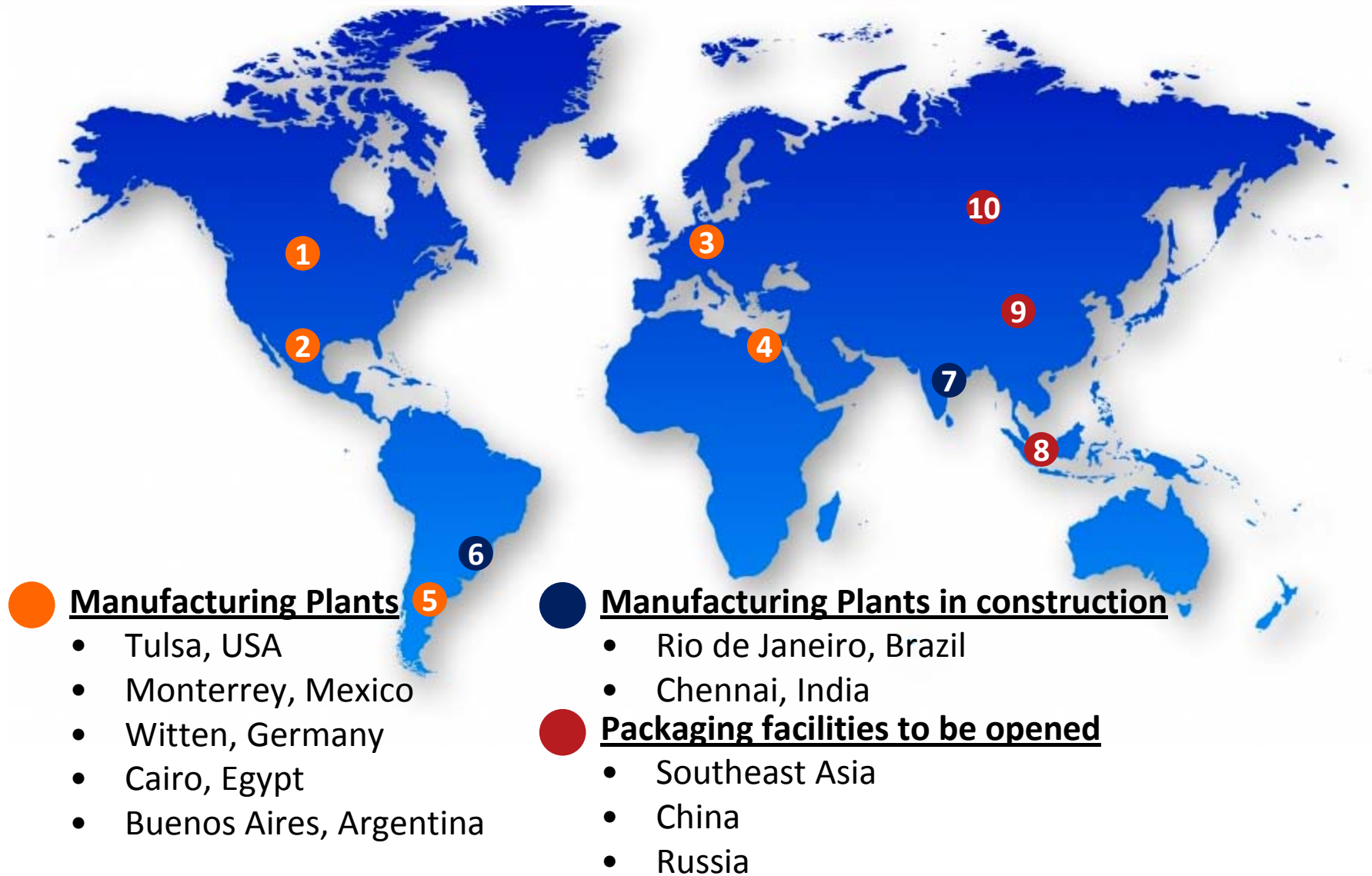


FLUOR DANIEL  
A FLUOR Company



# Ruhrpumpen Plant Overview

Company profile



# Ruhrpumpen Service Centers

Company profile





# Ruhrpumpen sales offices overview

Company profile



## Our Plants

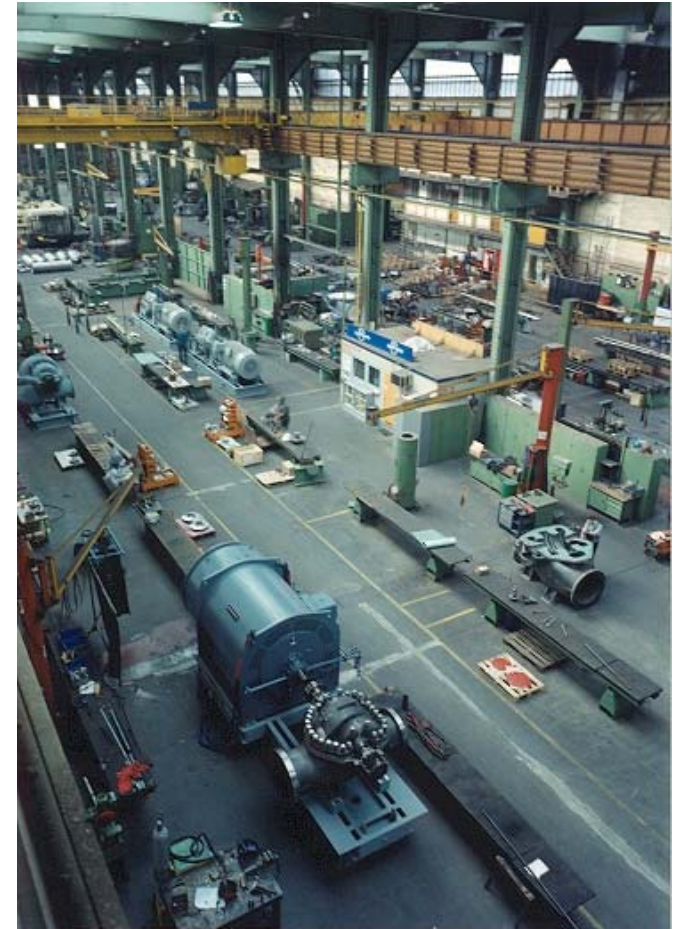




## Our Plants



## Our Plants





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## Pump Applications

Ruhrpumpen provides a “One-Stop-Shop” for a wide range of centrifugal pump applications, supported by over 1/2 century of experience.

Ruhrpumpen are self-sufficient by design and intent, and have resources within the EG group of:- Hydraulic design, Pump design, FEA/Dynamic/CDF capabilities, Full 3D-CAD design, Machining, Fabrication, Foundry.

This ensures we maintain full control of all manufacturing and design resources within the corporation.














# Pump Applications

## Application

Pipeline, Process Service in Refineries,  
Petrochemical Plants, Oilfields,  
On and Offshore, Power Plants.

## Application

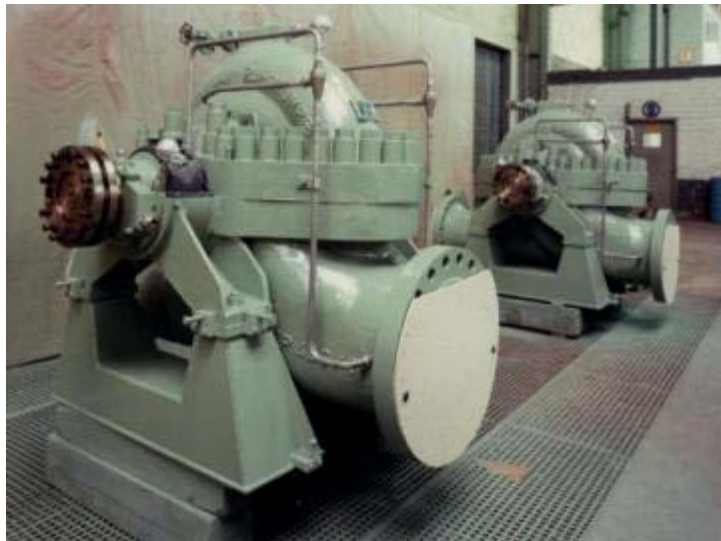
General Water Handling, Water Recovery  
Water Treatment, Irrigation, Cooling Water Circuits,  
Denitrification, Chemical.

SCE	SPN / SPI	VLT / VMT	RON	HVN / J	SMI / JTN	HS / ZM	A / ADC	ANSI	TR / VTP / VMF TRT / VCT	PVT / VAF / VPO / PV	ST / STV / STT SK / SKV / ESK	Sump Pumps
												
<b>PRODUCT DESCRIPTION</b> Volute Casing Centrifugal Pumps - API 610 - Horizontal - Single Suction - Single Stage - Bearing Bracket - Nozzles: end / top top / top	<b>PRODUCT DESCRIPTION</b> Volute Casing Centrifugal Pumps - API 610 and BS 4082 Code R - Vertical - Single Suction - Single Stage - Bearing Bracket - Nozzles InLine	<b>PRODUCT DESCRIPTION</b> Barrel-Type Pumps - API 610 - Cryogenic - Vertical - Single / Double Suction - Single / Multi Stage	<b>PRODUCT DESCRIPTION</b> Two Stage Centrifugal Pumps - API 610 - Horizontal - Single Suction - Two Stage - Bearings on both sides - Opposed Impellers alternatively - Double Suction for higher capacities	<b>PRODUCT DESCRIPTION</b> Volute Casing Centrifugal Pumps - API 610 - Horizontal - Double Suction - Single Stage - Bearings on both sides - Nozzles: top / top side / top side / side	<b>PRODUCT DESCRIPTION</b> Multi Stage Centrifugal Pumps - API 610 - Horizontal - Single/double Suction - Multi Stage - Bearings on both sides - Axially split - Nozzles inline - Opposed groups of impellers	<b>PRODUCT DESCRIPTION</b> Volute Casing Centrifugal Pumps - Horizontal - Double suction - Single Stage - Bearings on both sides - Axially split - Nozzles inline with diffuser	<b>PRODUCT DESCRIPTION</b> Barrel-Type Pumps - API - Horizontal - Single Suction - Multi Stage - Bearings on both sides - Axially split - Nozzles: top/top side/top side/side	<b>PRODUCT DESCRIPTION</b> Volute Casing Centrifugal Pumps - ANSI B73.1 - Horizontal - Single Suction - Single Stage - Bearing bracket	<b>PRODUCT DESCRIPTION</b> Mixed Flow Pumps Sump Pumps - Vertical - Single Suction* - Single / Multi Stage - Sump Pumps - Submersible motor available	<b>PRODUCT DESCRIPTION</b> Propeller Pumps - Vertical - Single Suction - Single Stage - Submersible motor available	<b>PRODUCT DESCRIPTION</b> ST: Two Channel Impeller SK: Three Channel Impeller ESK: Single Channel Impeller - Horizontal or vertical - Single Suction - Single Stage - Two channel pot impeller - Bearing bracket - Radially split - Discharge nozzle - Tangentially	<b>PRODUCT DESCRIPTION</b> Sump Pumps - Vertical - Sump - Single Suction - Single Stage
<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Condensate	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Condensate	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Water Sea Water Condensate Cryogenic Liquids	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Condensate	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Condensate	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical Solutions Water Sea Water	<b>BROAD APPLICATION RANGE</b> Crude Oil Finished Products Water Sea Water Condensate	<b>BROAD APPLICATION RANGE</b> Hydrocarbons Chemical solutions Water Sea water	<b>BROAD APPLICATION RANGE</b> Chemical solutions Water Hydrocarbons Service water	<b>BROAD APPLICATION RANGE</b> Cooling water Rain water River water Sea water Process water Fire service Deepwell	<b>BROAD APPLICATION RANGE</b> Cooling water Rain water River water Sea water Process water	<b>BROAD APPLICATION RANGE</b> Sewage Fecal matters Rain water Sludge Industrial waste water Un-screened sewage	<b>BROAD APPLICATION RANGE</b> Water Hydrocarbons Process water River water Chemical solutions
<b>PERFORMANCE DATA</b> Q 25-3.200 m <sup>3</sup> /h H 6 - 480 m	<b>PERFORMANCE DATA</b> Q 25-900 m <sup>3</sup> /h H 16 - 200 m	<b>PERFORMANCE DATA</b> Q 8-25.000 m <sup>3</sup> /h H 16 - 1.450 m	<b>PERFORMANCE DATA</b> Q 18-750 m <sup>3</sup> /h H 170 - 450 m	<b>PERFORMANCE DATA</b> Q 100-4.200 m <sup>3</sup> /h H 4 - 350 m	<b>PERFORMANCE DATA</b> Q 80-2.000 m <sup>3</sup> /h H 200 - 1.600 m	<b>PERFORMANCE DATA</b> Q 200-50.000 m <sup>3</sup> /h H 120 - 500 m	<b>PERFORMANCE DATA</b> Q 8-400 m <sup>3</sup> /h H 30 - 3.000 m	<b>PERFORMANCE DATA</b> Q 5-900 m <sup>3</sup> /h H 6 - 200 m	<b>PERFORMANCE DATA</b> Q 5-50.000 m <sup>3</sup> /h H 2 - 100 m	<b>PERFORMANCE DATA</b> Q 400-12.000 m <sup>3</sup> /h H 2 - 13 m	<b>PERFORMANCE DATA</b> Q 400-8.500 m <sup>3</sup> /h H 3,5 - 32 m	<b>PERFORMANCE DATA</b> Q 3-650 m <sup>3</sup> /h H 3 - 120 m

The above silhouettes show examples of the broad range of pumps available from Ruhrpumpen.



## Pumps for refineries and petrochemical industry



## Pumps for oilfields and pipelines





## Pumps for sewage services



## Pumps for power generation and cooling water



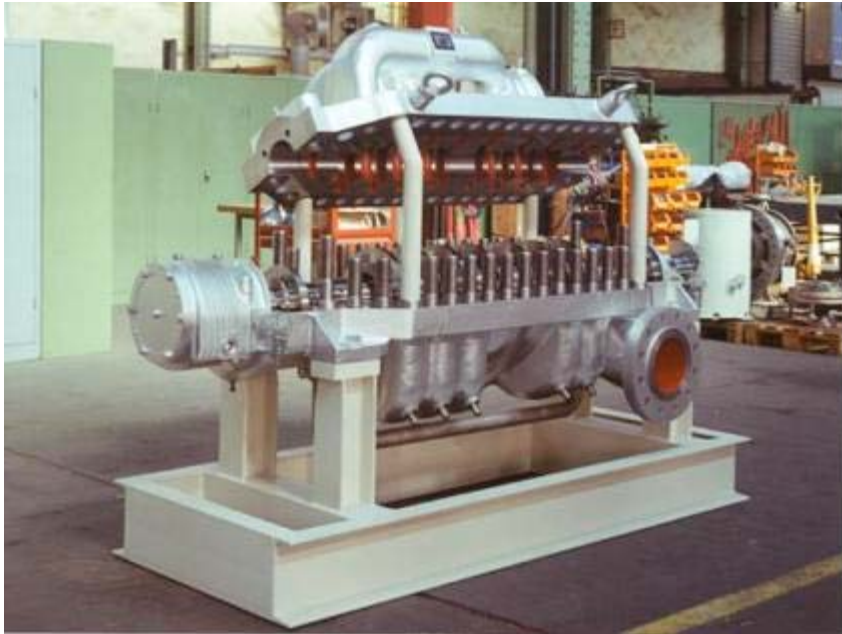


## Pumps for wastewater handling





## Pumps for general water service



## Complete decoking system





## Fire pumps / Fire systems



Pumps can be Diesel, Gas Engine or Motor Driven.



# **AGENDA**

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An essential requirement of Gas Shale Cracking, particularly in view of the need for pumps to be portable, is to ensure that high levels of ruggedness and durability are built into the design as reliability is paramount.



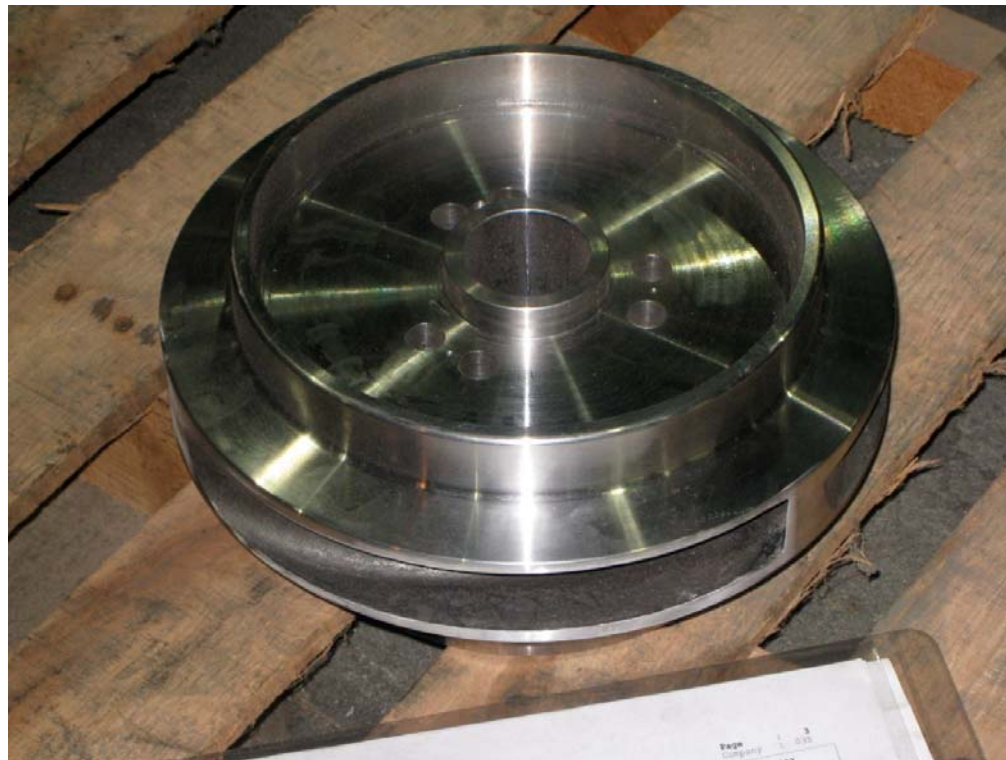
Casings are designed for pressures far exceeding requirements, to ensure a stable robust design.



Shafts are designed for durability with high service factors, ensuring long reliable lives.



Bearing assemblies utilize high quality, C3 clearance, anti-friction bearings which are either oil or grease lubricated, designed to ensure an extended L10 life of over 20,000 hours.



Impellers are dynamically & hydraulically balanced to G2.5 or better, ensuring minimum vibrations under all conditions.

Ruhrpumpen can satisfy many applications within the Gas Shale Cracking process, such as Water Transport & Water Recovery.



*Pumps used to supply fracturing process (Hassler, 2010; Marcellus-Shale.us, 2010).*

Typical water duty used in the shale cracking process that can be satisfied by our CPP, HSM or SM pump ranges.





*Pumps used to supply fracturing process (Hassler, 2010; Marcellus-Shale.us, 2010).*

Typical water duty used in the shale cracking process that can be satisfied by our CPP, HSM, HX or SM pump ranges.

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## Contact

**Please do not hesitate to contact us to get an answer on any question that you might have.**

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