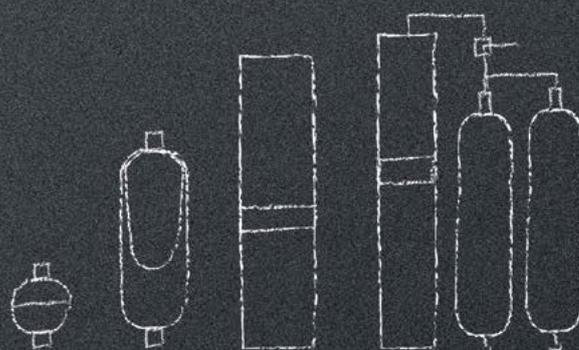


Expertise

**Roth**  
Hydraulics

What you should know  
about us



*excellent pressure solutions*

## *Welcome to Roth Hydraulics*

*We develop and produce custom designed products and systems for fluid technology. Our core products are hydraulic energy accumulator systems. Our many years of experience is the starting point for more innovative products and tailor-made solutions for fluid technology. Roth products enjoy an excellent reputation worldwide and represent strength and durability. International certifications and approvals ensure global acceptance.*

A hand is shown from the bottom left, holding the Roth Hydraulics logo. The logo consists of the word "Roth" in a stylized, blocky font, with a horizontal bar above and below it. Below "Roth" is the word "Hydraulics" in a bold, sans-serif font.

**Roth**  
**Hydraulics**



## Roth Hydraulics accumulator systems Worldwide proven quality in hydraulic technology

Roth Hydraulics, formerly  Bolenz & Schäfer, has been a leader in accumulation technology for more than 60 years. Our product range includes all types of hydraulic accumulators, from diaphragm and bladder accumulators, to piston accumulators and storage facilities to custom solutions. We see ourselves as a full-range supplier and the specialist for hydraulic accumulator technology. With our many years of know-how and our extensive manufacturing expertise, we offer the optimal product with the maximum customer benefit for every application.

Roth Hydraulics is a popular partner worldwide when it comes to technology and innovation in accumulation technology. Our customers and their requirements are the focus of our activities. Together with our subsidiaries in America and Asia, we offer a network with quick reaction times. Our motivation is the satisfaction of our customers all over the world.

Roth hydraulic accumulators prove themselves in a wide variety of applications and markets everywhere. In addition to a wide range of standard options, our custom solutions always meet standards for reliability and durability, even under the most diverse circumstances. Whether in wind power with maximum maintenance intervals and integrated monitoring systems, or in the field of oil and gas as energy reserves in case of emergency at temperatures of down to  $-60^{\circ}\text{C}$ , our storage systems always provide safe operation for your equipment.

We provide comprehensive consultation for our customers, from the design to approval. In addition to application-oriented development and manufacture of accumulator systems, we also offer extended support for delivery and beyond with our exceptional expertise. Accessories, installation tools, and service – from the interval-related exchange of components to recurring inspections and training related to the hydraulic accumulator – round out our portfolio.

**Take advantage of our expertise and our know-how – we're always here to help.**

### ■ ROTH hydraulic accumulators – durable and reliable

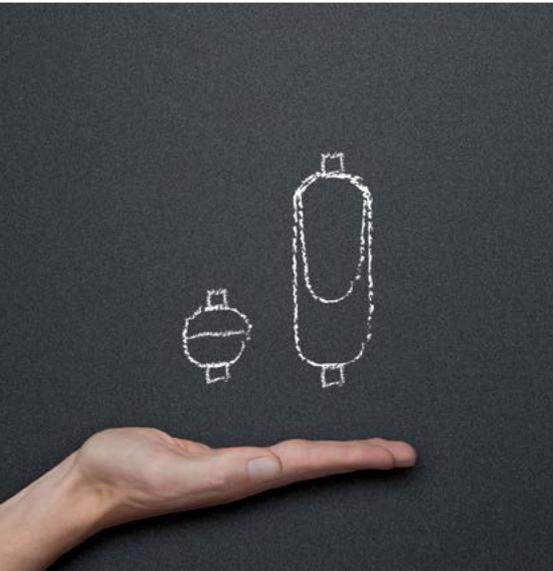
Roth hydraulic accumulators are versatile and make a significant contribution to improving the energy efficiency of hydraulic systems.

Using a Roth hydraulic accumulator, for example, can minimize the required electrical power and recuperate kinetic energy from the overall system.

Roth hydraulic accumulators reduce operating costs and make an active contribution to environmental and resource protection. Typical applications include:

- > Energy storage
- > Energy recuperation
- > Emergency and security functions
- > Damping of vibration or pulsation
- > Compensation of pressure surges
- > Volume or leakage-oil compensation
- > Suspension systems
- > Media separation

## Diaphragm accumulators · Bladder accumulators



- > Volume: 0.07 l ... 3.5 l
- > Operating pressure: up to 350 bar
- > Operating temperature: -35° C ... +80° C

### ■ Roth diaphragm accumulators - compact & universal

Roth diaphragm accumulators are ideal for industrial and mobile applications thanks to their compact and lightweight design. Different diaphragm materials make the accumulators suitable for extreme operating temperatures and a wide range of fluids.

#### Typical product characteristics:

- > Compact and weight-optimized design
- > Any installation position, preferably vertically with the oil-side down
- > High efficiency, no pressure difference between fluid and gas
- > Low-maintenance and durable

- > Volume: 1 l ... 57 l
- > Operating pressure: up to 420 bar
- > Operating temperature: -32° C ... +120° C

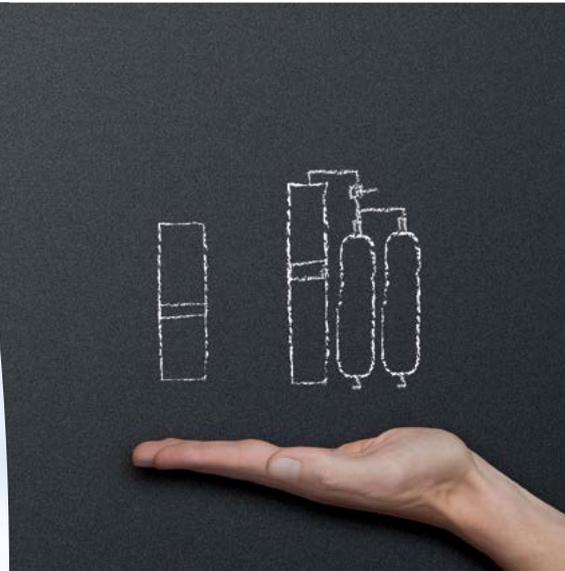
### ■ Roth bladder accumulators – efficient & innovative

Roth bladder accumulators allow efficient operation through their weight-optimised design and the negligible pressure difference between fluid and gas sides. The use of different bladder materials makes Roth bladder accumulators suitable for a wide variety of fluids and a wide range of temperatures. Custom versions with, for example, high-flow oil valves or minimized friction plastic coating, make Roth bladder accumulators a truly innovative product and allow for a significantly enhanced range of applications.

#### Typical product characteristics:

- > Compact and weight-optimized design
- > High efficiency, negligible pressure difference between fluid and gas
- > Rapid response to pressure changes in the hydraulic system
- > Low-maintenance, easily serviced and durable

## Piston accumulator · Accumulator systems



### ■ Roth piston accumulators – individual & versatile

Roth piston accumulators are highly efficient and can be tailored to customer requirements by adjusting the fluid connections and the sealing system. Additional options like a built-in stroke limiter or a wide range of measurement and monitoring equipment allow continuous monitoring of the operating status and energy content. This makes Roth piston accumulators a truly versatile product.

#### Typical product characteristics:

- > High volumes and performance possible
- > High efficiency through reduced-friction sealing systems
- > Any installation position possible
- > Optional monitoring of the piston position through various systems
- > Sudden loss of gas to the fluid side impossible
- > Scheduled maintenance intervals, service-friendly and durable

- > Volume: 0.1 l ... 1,500 l
- > Operating pressure: up to 1,200 bar
- > Operating temperature: -60° C ... +200° C

### ■ Roth accumulator systems – specific & flexible

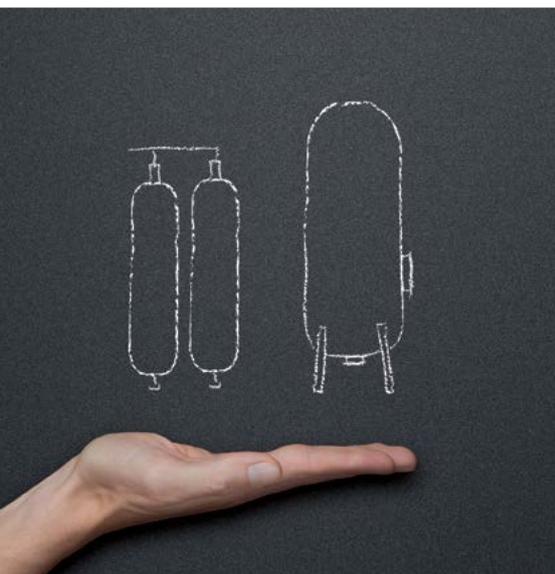
Roth accumulator systems – set-up as bladder accumulator or piston accumulator systems – are specially designed and simulated to meet customer requirements using the Roth ACCU software. Roth accumulator systems are fully piped, have all necessary safety and monitoring devices and comply with international rules and regulations. As an option, we can provide an operation-ready delivery with all the required gas preload pressure ex works.

#### Typical product characteristics:

- > System volume almost unlimited
- > High volumes and performance possible
- > Requirement-specific design and installation-ready delivery
- > Standard modular design allows flexible adaptation

- > Volume: practically unlimited
- > Operating pressure: Standard up to 360 bar
- > Approvals worldwide

## Standard pressure vessels · Large pressure vessels



> Volume: up to 75 l  
> Operating pressure: up to 360 bar

### ■ Roth standard pressure vessels – economical & reliable

Roth standard pressure vessels are seamless pressure accumulators available in the sizes 50 and 75 l and pressure levels 220 and 360 bar. They are used as secondary switching containers for storage or as pressure accumulators for different types of gases.

#### Typical product characteristics:

- > High efficiency, flexible application in accumulator facilities
- > Easy to install
- > Suitable for various gases

> Volume: up to 11,000 l  
> Operating pressure: up to 350 bar

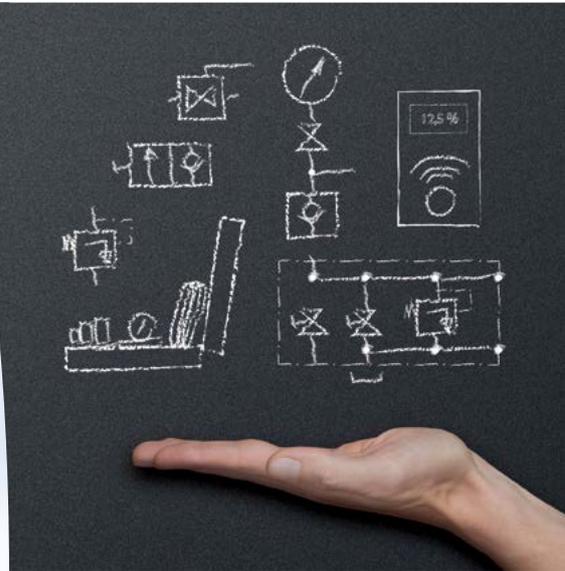
### ■ Roth large pressure vessels – scalable & particular

Roth's large pressure vessels are welded pressure accumulators with a storage capacity of up to 11,000 l in various diameters, lengths and pressure levels. When used as a secondary switching container for accumulator facilities, they enable optimization of installation space. Moreover, with the addition of monitoring and control equipment, they can be used as gapless accumulators in which the fluid is directly supplied with air or nitrogen.

#### Typical product characteristics:

- > High efficiency, application-specific design
- > Easy to install
- > Interior coating available
- > Suitable for various gases

## Accessories · Calculation program



### ■ Roth accumulator accessories - tested & substantial

Roth accumulator accessories are designed and tested specifically for use in accumulator systems. In addition to installation systems, we provide the necessary permits for operation with oil and nitrogen as well as equipment and devices for filling storage systems with nitrogen including all necessary display, security, and shut-off devices.

#### The accumulator accessory program includes, for example:

- > Safety equipment, such as safety valves, bursting discs, fuses
- > Safety and shut-off blocks in various sizes and designs
- > Gas-side accessories, such as filling and test blocks, shut-off units, piping components
- > Filling and test equipment for nitrogen, nitrogen chargers
- > Mounting devices, such as clamps and brackets

### ■ Roth ACCU – validated & helpful

The Roth ACCU design and simulation program represents our many years of experience and manufacturing expertise. In addition to the simple and custom dimensioning of hydraulic accumulators, the simulation function enables the optimization of storage systems.

#### Typical product characteristics:

- > Simple design function
- > Projection of accumulator systems
- > Simulation of the operational behaviour
- > Detailed project documentation

- > Operating pressure: Standard up to 360 bar
- > Approved for nitrogen

- > Projection
- > Simulation

# Applications



## ■ Roth hydraulics products in use

Roth Hydraulics products prove themselves every day in a wide variety of applications. Whether as passive components for an emergency supply or as active system components. Our products and solutions find wide acceptance anywhere hydraulic energy needs to be stored or converted.

Every industry, every customer and every application demands unique solutions, which our products take into account. Our manufacturing expertise, in conjunction with absolute customer focus and global references, are the basis of our success.

Roth accumulator systems are widely used

to store energy in the plant engineering. In this way, they make a significant contribution to improved energy balance and to the reduction of operating costs. They also ensure secure energy supply during power failure.

## ■ Benefits for the customer

- > Reduced connection load
- > Improved energy balance
- > Emergency supply in case of power failure
- > Reduced operating costs
- > Cycle time reduction
- > Increase reliability
- > Maximized availability
- > Improved performance
- > Energy recuperation
- > Comfort enhancement
- > Reduced emissions
- > Energy reserves



System for foundry technology



System for steel smelting furnace



System for hydraulic press



System for hydraulic press



*Roth hydraulic accumulators – specific solutions for a variety of applications*

## ■ Markets & industries

### Heavy industry:

- > Steelmaking
- > Foundry technology
- > Steel forming

### Machine Tools

- > Die casting technology
- > Press technology
- > Injection moulding technology
- > Blow moulding systems

### Energy / power plant technology

- > Wind turbine systems
- > Hydropower plants
- > Solar thermal systems
- > Energy distribution

### Oil and gas

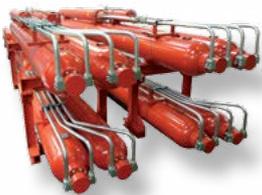
- > Onshore
- > Offshore and marine engineering
- > Pipeline technology

### Mobile hydraulics

- > Mobile machinery
- > Construction machinery
- > Agricultural machinery

### Customized solutions

- > Leisure industry
- > Testing technology
- > Stage technology
- > Hydro forming



*System for a roller coaster at Ferrari World Abu Dhabi*



*System for a foundry ladle furnace*



*System for hydropower plant*



*System for hydropower plant*



*System for test systems*

# History



*The beginnings – forging process*

Heinrich Schäfer started Bolenz & Schäfer in Biedenkopf in 1943, the foundation of a company whose product range included forging and mechanical drive components. With dynamic innovation and consistent customer focus, the product range included advanced hydraulic accumulators and hydraulic equipment as early as the 1950s.

An important milestone in the company's history was the introduction of the Roth Industries in 1989. A family-run company, Roth enabled the continued dynamic and successful product development. The product range was extended and internationalization expanded through the establishment of subsidiaries in the most important markets.

More than 60 years of experience in accumulator technology, a complete range of products and locations in Asia and America, make Roth Hydraulics a world-leading specialist in accumulator technology.

- 1943** Founding of the company BOLENZ & SCHÄFER
- 1952** Development and production of hydraulic components and piston accumulators
- 1989** Bolenz & Schäfer becomes a part of Roth Industries
- 1994** System supplier in the area of railway technology for energy-autonomous, radio-controlled hydraulic systems and hopper wagons
- 2011** Bladder accumulators added to the product range
- 2013** Diaphragm accumulators added to the product range
- 2014** Establishment of BSD Hydraulic Technology (Taicang), now Roth Hydraulics (Taicang), China
- 2016** Foundation of Roth Hydraulics NA, USA
- 2016** Name change – Bolenz & Schäfer becomes Roth Hydraulics

**For more information about Roth Industries:**  
[www.roth-industries.com](http://www.roth-industries.com)

## Roth Hydraulics international



### EUROPE

**Biedenkopf:** Research and development, production, sales and service



### ASIA

**Taicang:** Sales, installation, service



### USA/CANADA

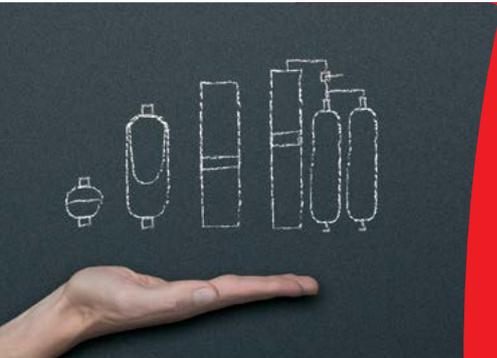
**Syracuse:** Sales, installation, service

We meet the complex requirements of a global market with our network of subsidiaries, representatives and distribution partners, ensuring on-location competence, customer orientation and service. Our specialists speak the language of our clients and provide comprehensive support in all questions relating to hydraulic accumulators.

In our factory in Germany, we focus on research and development and set the standards in technology, production processes and quality. In this way, we ensure "Made in Germany" quality for our foreign subsidiaries. The knowledge and skills of our local employees ensures the consideration of local market and customer-specific requirements.

**All sites are ISO 9001 certified.**





## Roth Hydraulics

### Accumulators

- > Diaphragm accumulators
- > Bladder accumulators
- > Piston accumulators

### Accumulator systems

- > Accumulator systems
- > Monitoring systems
- > System accessories
- > Pressure vessels

### Custom solutions

- > Spring-loaded accumulator
- > Damper systems
- > Railway hydraulics
- > Custom accumulators

**Roth**  
Hydraulics



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