



THIELE

rodaindustria IBÉRICA S.A.



Conveyor Chains for the Cement Industry

CHANGE[®]
for Success

THIELE – in Partnership with Cement Makers



Company history

The THIELE Company was founded more than 70 years ago and is now one of the world's leading chain manufacturers. THIELE's know-how has developed over many years of designing and producing industrial grade chains. Our highly skilled workforce and modern, high-performance production facilities guarantee products of the finest quality.



Chain production

All our chain components are manufactured in-house, where facilities include the latest multi-axis CNC milling machines along with the company's own drop forging shop. The wide range of in house manufacturing processes includes cutting, metal removing, forming and various welding processes (such as flash butt welding and upset butt welding), giving the company a broad portfolio of expertise. In 2000 THIELE installed 'state of the art' laser cutting equipment capable of handling the very latest types of fine-grained steel.

Consulting service

THIELE engineers provide an on-site consulting service and work with clients to produce job-specific solutions. New designs produced in the engineering department are then manufactured in the company workshops.

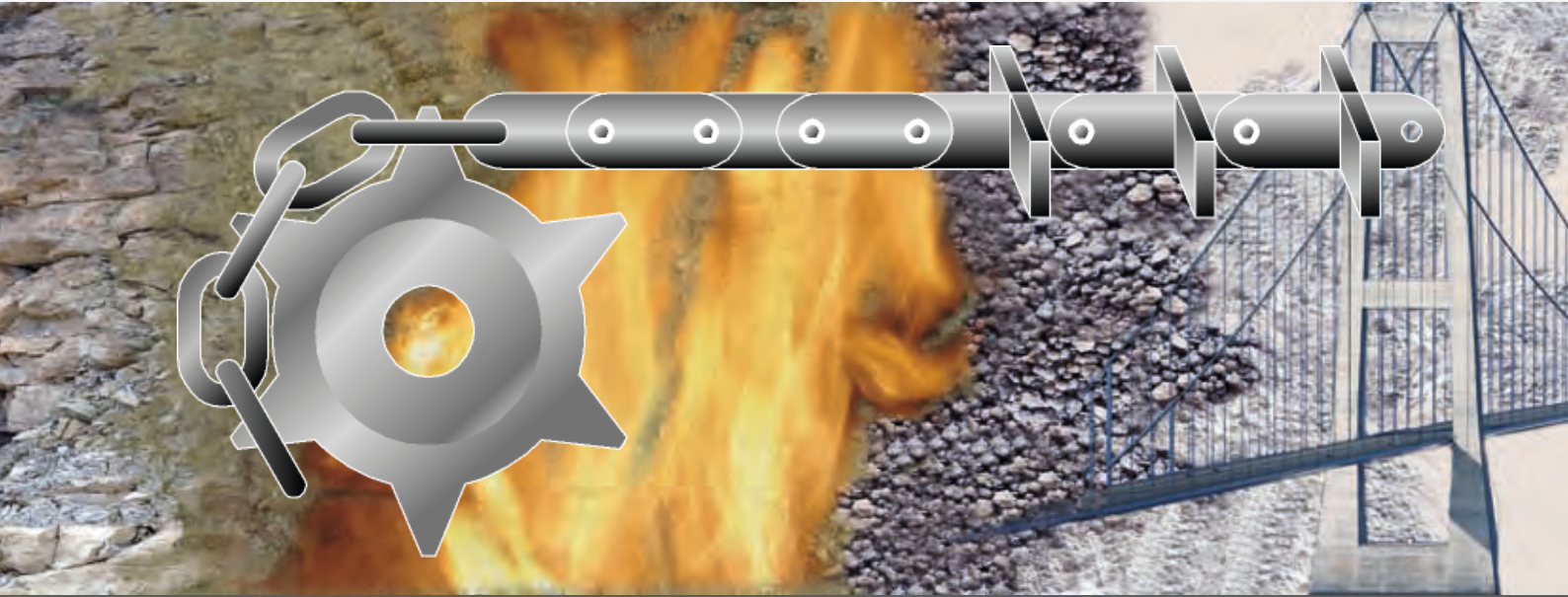


Example: T-ALPHA®
patent hole punching system

Round link chains

- case hardened
- hot-dipped galvanized
- quenched and tempered
- diameter range 14 - 60 mm
- breaking force up to 4500 kN

Reliability, Experience, Versatility



Forged link chains

- drop forged
- dog-bone profile
- chain pitch of 102 mm to 260 mm
- breaking force up to 2100 kN
- case hardened for high wear resistance
- hot-dipped galvanized for resistance against corrosion
- heat treated for higher breaking strengths
- armour-plated for reduced chain wear
- bushings supplied in a variety of exotic materials to suit application



Plate link chains

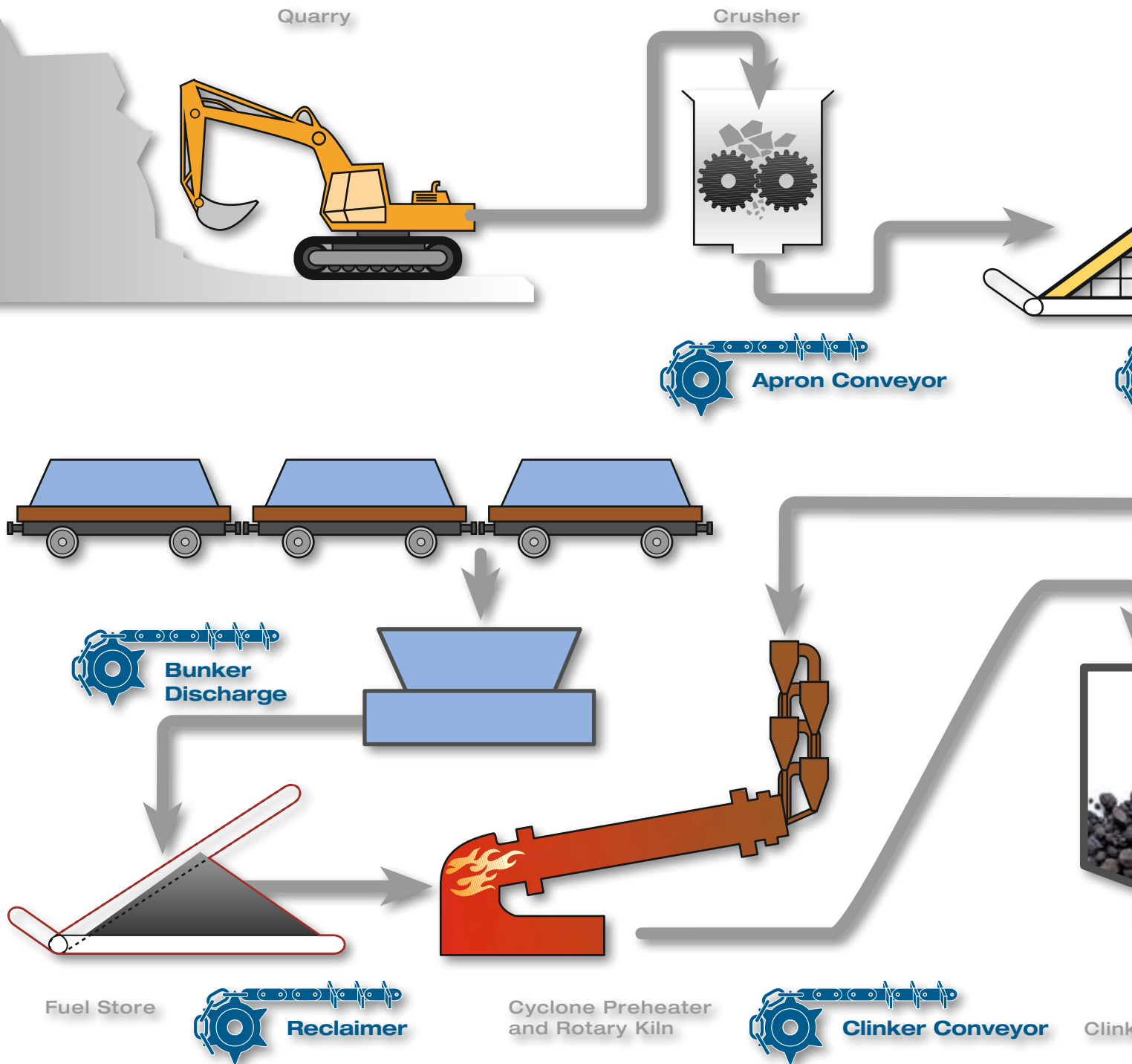
- accurate laser cutting offers optimized contours
- patented T-Alpha® punching increases fracture strength by up to 20%
- sealing arrangements to prolong service life
- chain pitch of 80 mm to 500 mm
- can be hot-dipped galvanized for high resistance against corrosion
- heat treated for higher breaking strength

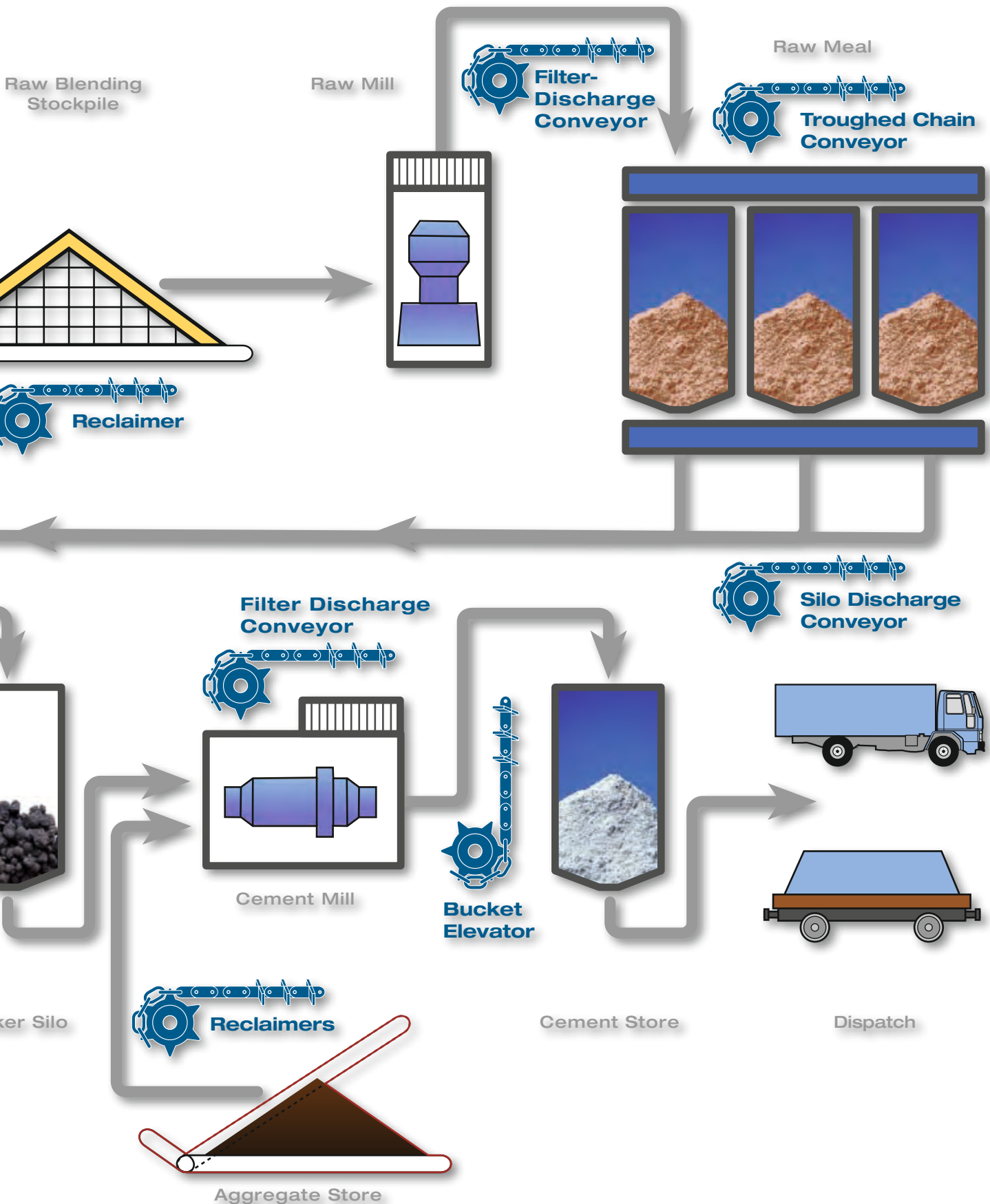


Sprockets

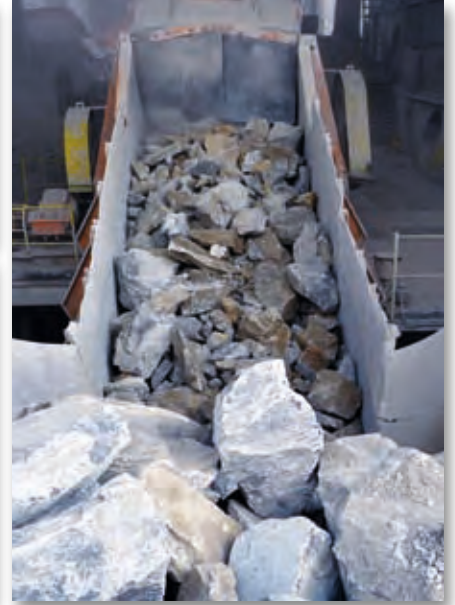
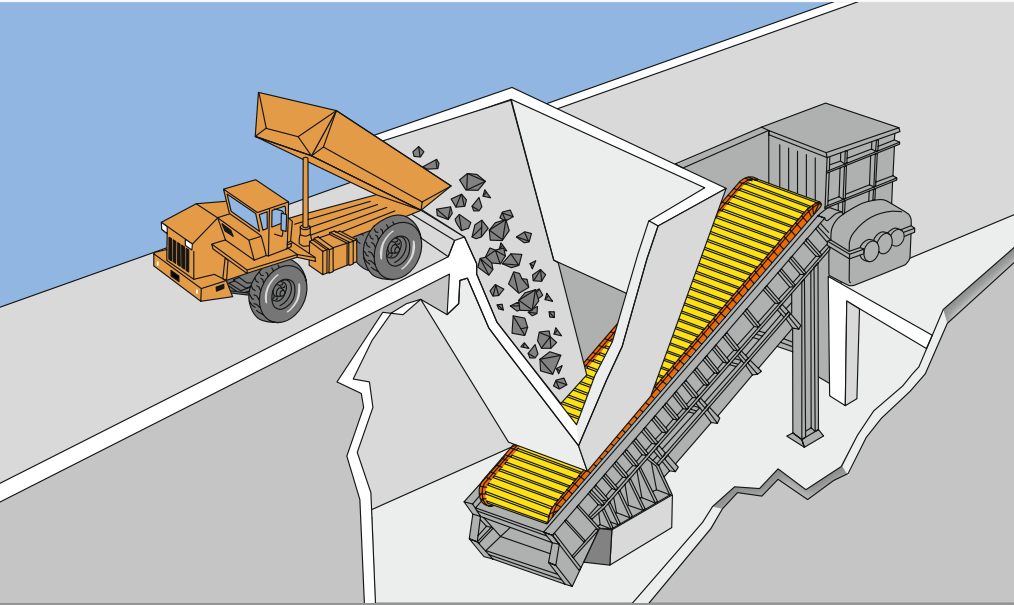
- for all chain types
- interchangeable tooth segments
- hardened tooth faces
- special geometry allows optimum interaction between chain and fittings
- compatible with all existing drive systems

Conveyor chains for the cement industry





Heavy-Duty Apron Conveyors

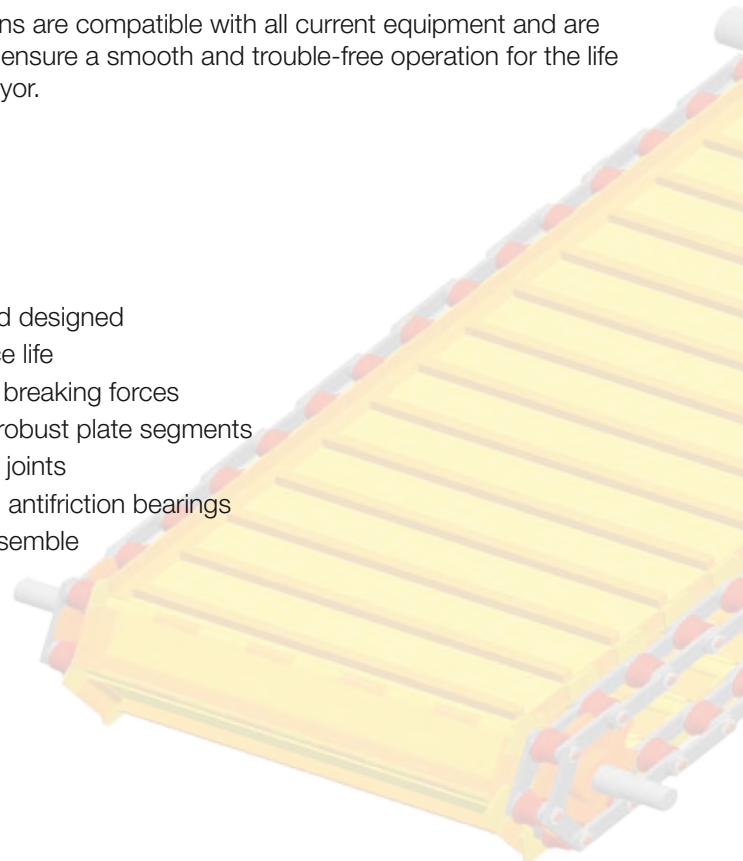


THIELE can supply heavy-duty chains and steel-plate conveyors for crusher plants, quarries and at cement and lime works.

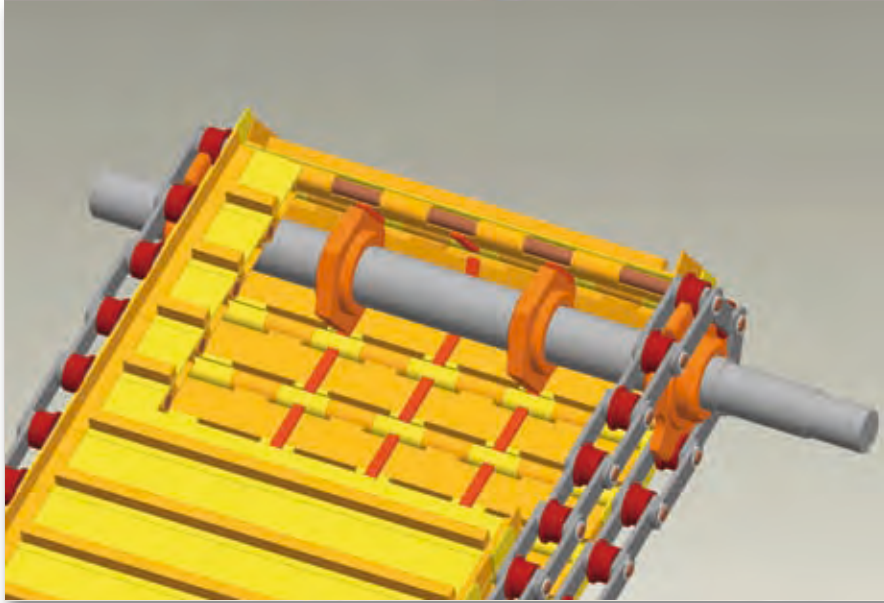
THIELE chains are compatible with all current equipment and are designed to ensure a smooth and trouble-free operation for the life of the conveyor.

Benefits

- customized designed
- long service life
- high chain breaking forces
- extremely robust plate segments
- fitted plate joints
- rollers with antifriction bearings
- easy to assemble



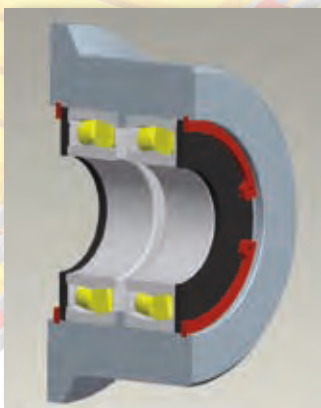
Heavy-Duty Apron Conveyors



As well as producing chains and plate segments THIELE often receives orders for the supply of complete shaft assemblies. The chain, sprockets and support wheels are factory assembled to ensure all items are compatible.

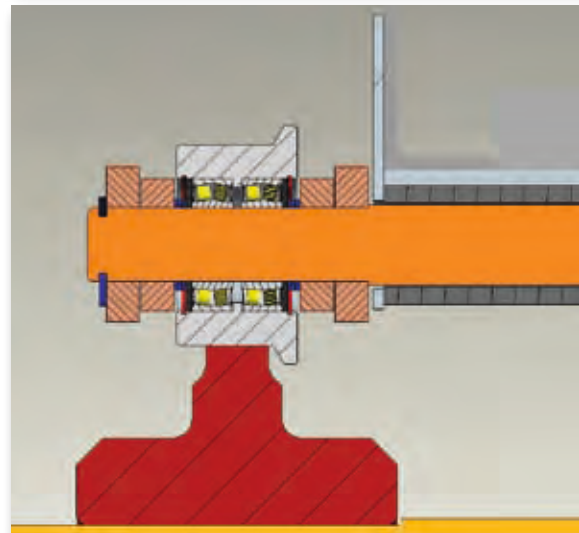
THIELE plate conveyors are available in two versions:

- chains with integral rollers
- rollers attached to the machine frame



Bearing-mounted rollers improve reliability and reduce operating costs. Wear-resistant materials are used for high wear components such as the roller track.

THIELE rollers are manufactured from high-grade materials and feature induction-hardened contact surfaces and double-shielded roller bearings.



Conveying Raw Materials



Conveyor systems for cement works come in various shapes and sizes and are designed for handling a variety of bulk materials, such as aggregates and fuels.

This diversity of materials calls for individual solutions.

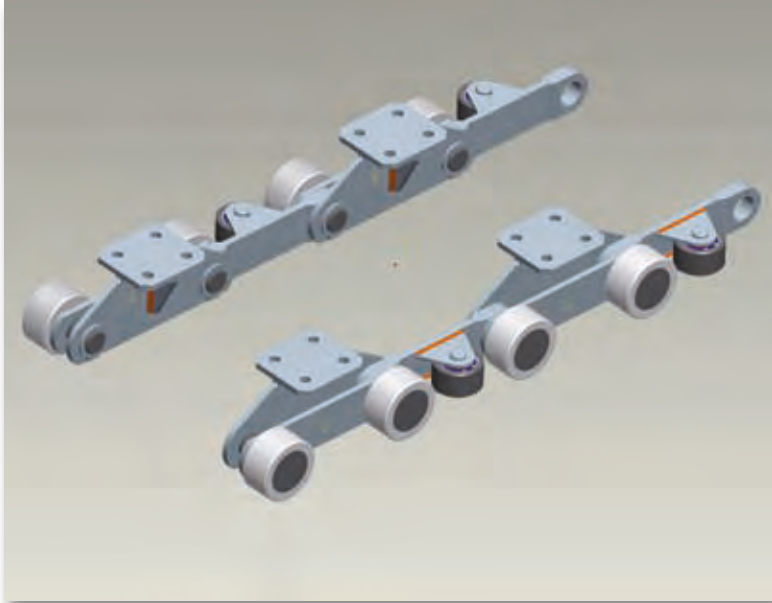
With THIELE's long-standing experience in designing and planning chain handling systems for reclaimers, our clients can be assured that the system they order will be built exactly to specification and will deliver an optimum service life.

Benefits

- tailored to client requirements
- long service life
- suitable for hostile and aggressive environments
- high chain breaking forces
- large variable chain pitch
- low maintenance

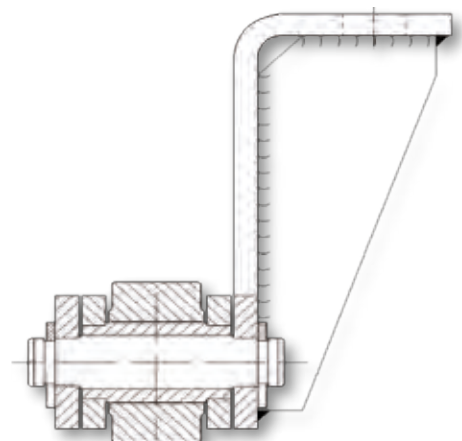
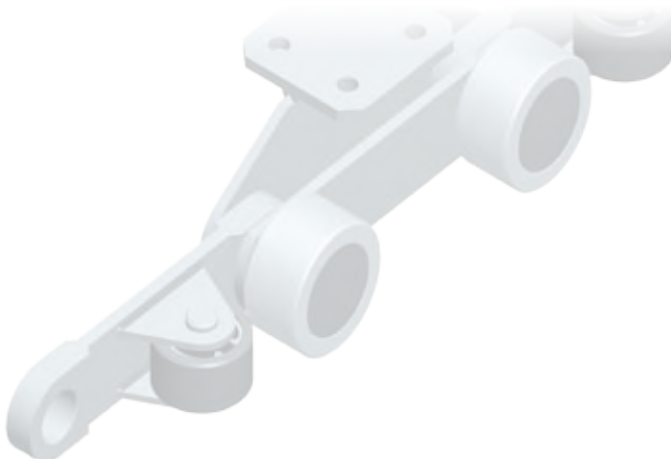


Customized Solutions



A few samples of customized chain systems:

- sealed-for-life antifriction roller chain for aggressive and adhesive product; lateral guide-elements also featuring sealed antifriction rollers
- small rollers help extend service intervals; lateral chain guides with anti-wear strips
- scraper chains on the harrow bar to break-up the primary material



Trough Chain Conveyors



Due to their compact and robust construction dust-tight trough chain conveyors can operate very effectively as:

- filter-ash conveyors
- silo-feeder conveyors for clinker
- proportioning conveyors for additives and coal

Trough conveyors use forged fork-link plates that are assembled to create single or double-strand chains.

THIELE can supply a vast range of forged fork-link assemblies. As all our forging is done in-house specific materials can be selected to suit each application.

Careful heat treatment ensures optimum service life and component reliability - even when operating at high temperatures and with abrasive product.

Benefits

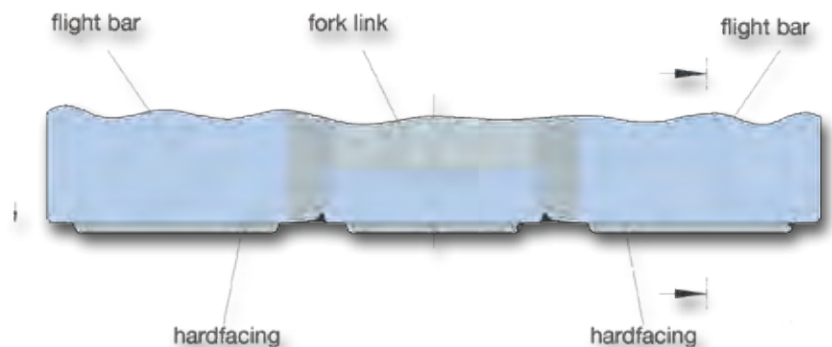
- FEM-optimised fork link design
- anatomical 'dog bone' web profile
- drop forged according to fibre orientation
- accurate machining
- large range of types and product options



Customized Solutions



Hardfacing highly stressed areas can often extend component life significantly



Our expertise stems from years of experience and continuous involvement in developing materials handling solutions for our clients.

We have a proven track record, not only for developing new chains to customer specifications, but also for matching and fine tuning all the tribological components that go to make up the trough chain conveyor system.

With careful selection of the base material THIELE is able to fit wear-resistant or stainless steel bushings to its forged fork-link chain assemblies without reducing the required breaking strength.

Bunker Discharge Conveyors



Bunker discharge conveyors are typically fitted with standard round-link chains that are connected to form multiple-strand chain assemblies (2-5).

By using the latest computer-aided calibration technology THIELE is able to match several round-link chains to a very high degree of precision with little or no variation in length tolerance.

Short-strands for long chain assemblies can be fitted thanks to the huge array of outboard chain connectors and flight attachments available.

A range of chain sprockets, idlers and shafts complete the THIELE product portfolio.

Benefits

- high chain breaking forces
- uniform loading over each chain assembly due to precise calibration
- long operating life of the system, achieved by using chain links with wear-resistant shoulders
- forged outboard flight bars
- low maintenance costs



Universal push-fit flight holders give operators the option of re-using existing flight bars and running long-reach chain assemblies

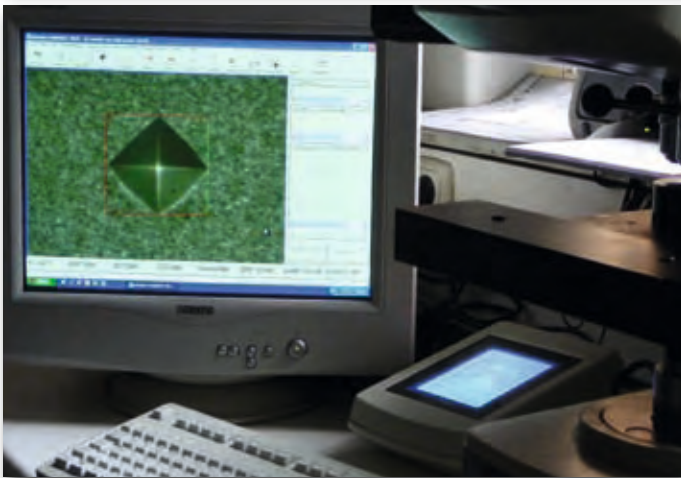


Forged outboard chain clamps and solid-web flight bars with short-reach chains

Round-Link Chains and Fittings



Heat treating round-link chains



Checking the case hardening depth in the laboratory

THIELE is one of the world's leading manufacturers of round-link chains and our product range encompasses chains with diameters ranging from 4 mm to 60 mm.

Through hardened or case hardened chains are produced in a wide range of chain steels and hardened steels, according to application requirements.

For corrosive applications THIELE recommends using hot-dipped galvanized TZN round link or stainless-steel chains.

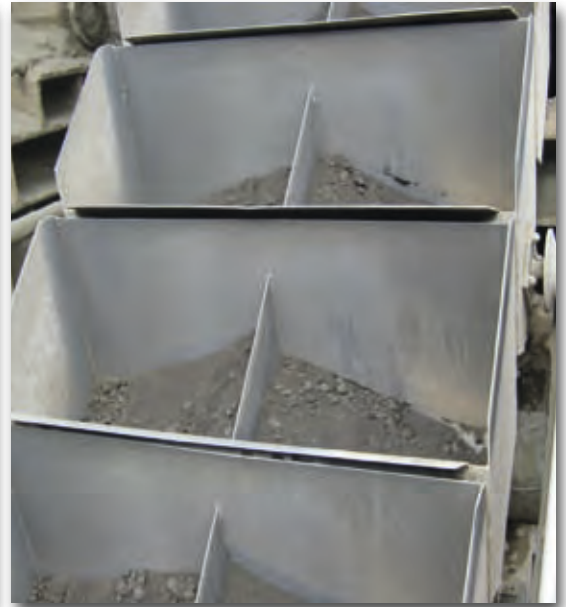
Abrasive environments require chains with high surface hardness (up to 800 HV) and increased case hardening depth of 550 HV to $0.1 \times d$.

Benefits

- high toughness combined with high strength
- high wear resistance
- high dimensional accuracy
- close tolerance pairing on short-strands for long chain assemblies
- high safety factors
- corrosion protection available for increased service life



Clinker Conveyors



High temperatures, abrasive products and long conveying distances impose tough demands on conveyor chains, rollers, plates and/or segments.

THIELE clinker chain conveyors are assured of a long service life thanks to the use of the latest materials combined with precise heat treatment of the individual components.

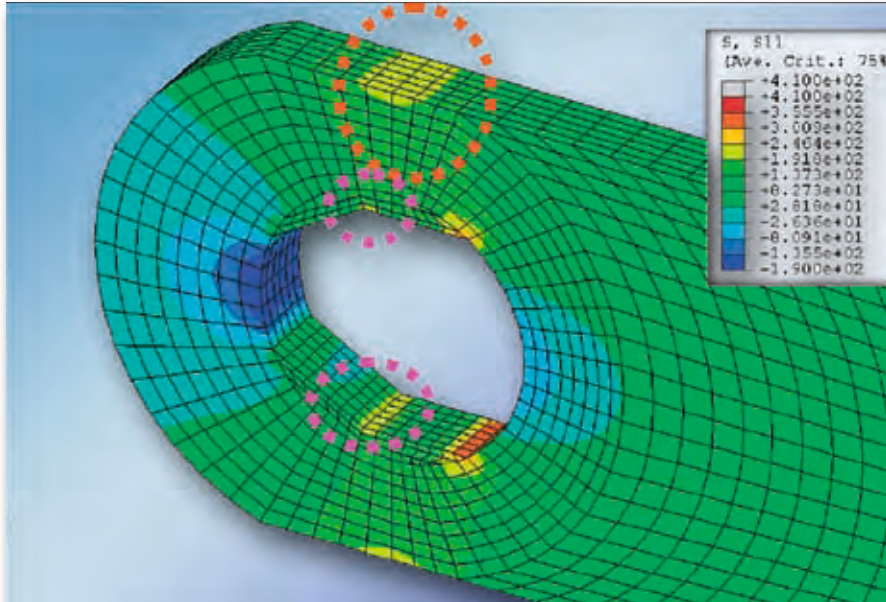
THIELE's patented T-Alpha® hole punching system increases chain breaking strength by up to 20 %.

Benefits

- suitable for the toughest working conditions
- long service intervals
- high chain breaking forces
- maintenance free idler rollers
- precision fitted plate troughs



T-Alpha®



Stress distribution pattern of T-Alpha® hole punch system



The special shape of the hole and bush faces guarantees safety and reliability even under the most difficult operating conditions.

Benefits

- breaking forces increased by up to 20 %
- even force distribution resulting in reduced stress levels
- significant increase in elongation at fracture
- system can withstand higher stress reversals and load cycles
- compatible with all equivalent systems



Bucket Elevators



The cement industry uses a variety of bucket elevators for the vertical conveying of bulk materials.

Given the often highly abrasive nature of the product and the high dynamic stresses involved, it is vital to have a conveyor system that has been specifically designed for the job in hand.

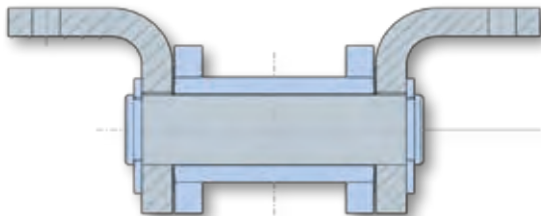
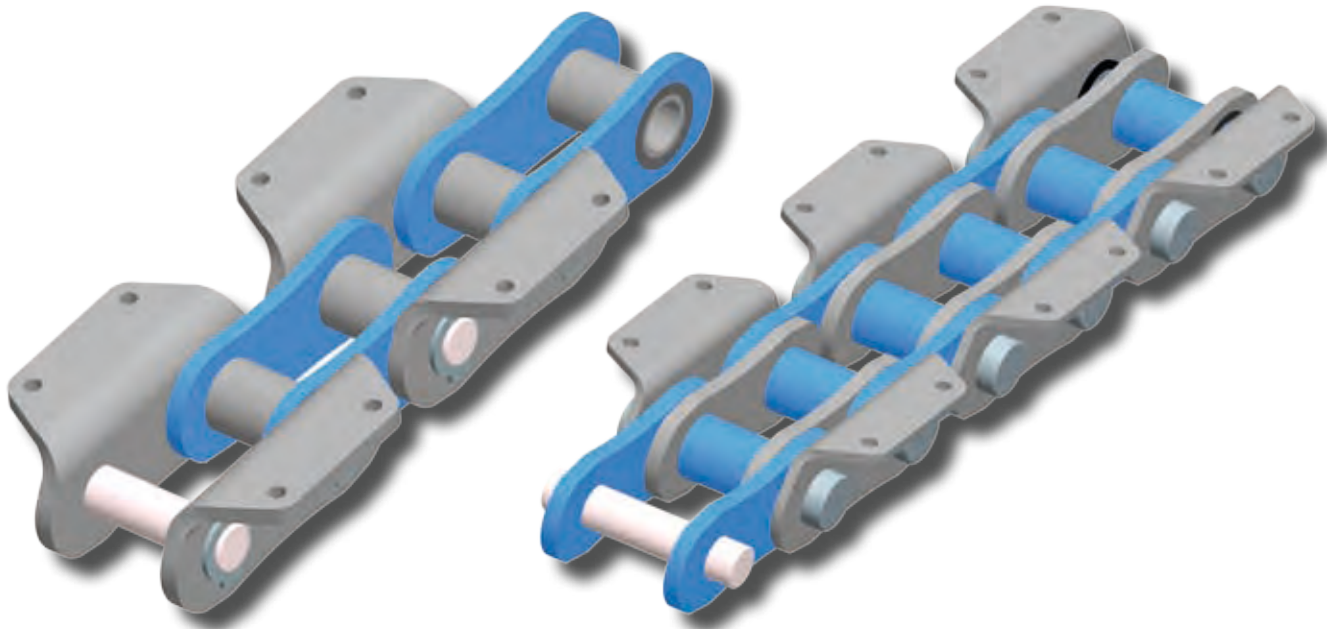
THIELE has a range of high-performance bucket elevator chains that have been specially developed for cement industry operations. These installations can operate either as centre-chain or as double-chain elevators.

Benefits

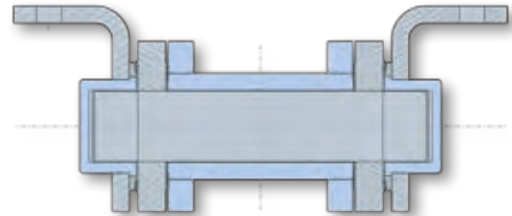
- long service intervals
- suitable for the toughest working conditions
- high chain breaking forces
- sealed versions available
- designed to match existing elevator systems
- low maintenance costs



Bucket Elevator Chains



THIELE-HLB-chain



THIELE-HLB-W-chain

Our specialist engineers can draw on years of hands-on experience and this has been put to good use in developing THIELE bucket elevator chain systems. 'State of the art' material science and FEM analysis technology have been used in the design and development of the components. By employing the latest manufacturing techniques we are able to keep costs down, while at the same time ensuring the highest level of product quality is maintained.

Recommendation

THIELE's reversible high-performance bucket elevator chains (type HLB-W) can deliver more service life from the wearing parts. The optimized shape of the plate links generate less surface pressure and reduces the amount of chain wear at the sprockets, while the easy-to-fit and sealed bucket holders help increase the nominal breaking strength of the chain.



Sprockets, Idlers and Shafts



To obtain optimum life expectancy from a THIELE chain assembly we strongly recommend fitting new sprockets as part of the chain replacement process. In many cases this merely involves replacing the worn tooth rings or races. THIELE can also supply complete sprockets, guide rollers and shafts, if required.

Replaceable sprocket segments and complete sprocket wheels can be supplied in all standard sizes for bushed conveyor chains, fork-link chains and round-link chains. We also stock a wide range of internal and external toothed and toothless chain sprockets for existing systems.



Benefits

- large range of types and sizes
- one-off components can be supplied to customer specifications
- specially hardened running surfaces and tooth faces
- easy-to-fit design



Customer Support, Service, Maintenance and Repairs



Gauge for measuring chain length



As well as supplying moving components and spares for chain conveyors, THIELE also offers a complete support service for chain-system operators.

DGZfP-trained service technicians (German Association for Non-destructive Testing) can perform on-site electromagnetic testing on sling systems and lifting equipment and issue the required test certificates.

We can also carry out full inspections on horizontal and vertical chain conveyors and supervise the assembly and commissioning of chain systems.

Service provided

- supervision of assembly and commissioning
- wear measurements and inspections
- repair and maintenance
- training
- technical support
- electromagnetic crack testing of lifting gear and sling systems



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