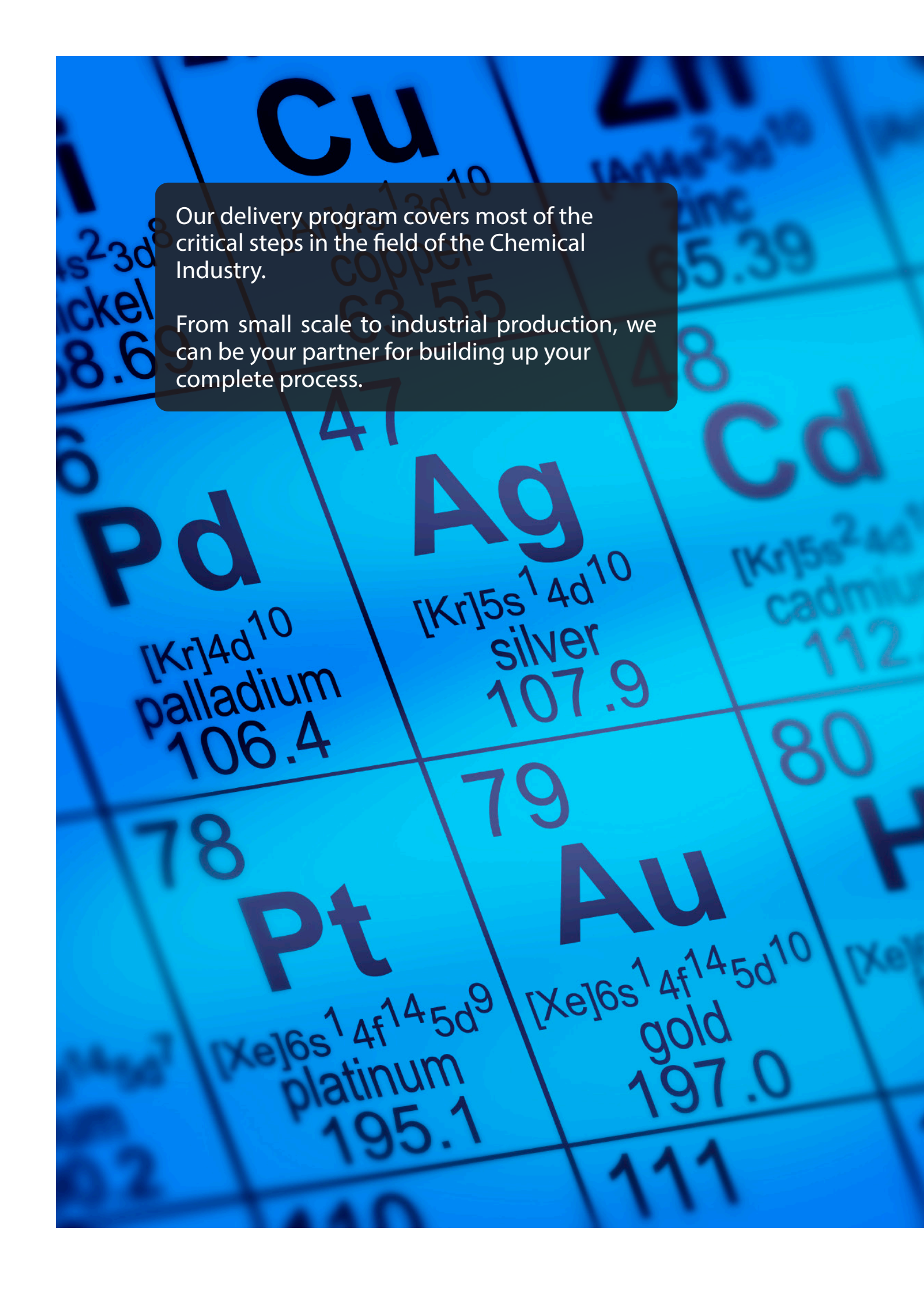




CHEMICAL

THURNE
TEKNIK



Our delivery program covers most of the critical steps in the field of the Chemical Industry.

From small scale to industrial production, we can be your partner for building up your complete process.

Pd
 $[\text{Kr}]4d^{10}$
palladium
106.4

Ag
 $[\text{Kr}]5s^1 4d^{10}$
silver
107.9

Pt

$[\text{Xe}]6s^1 4f^{14} 5d^9$
platinum
195.1

Au

$[\text{Xe}]6s^1 4f^{14} 5d^{10}$
gold
197.0



"To think is to practice brain chemistry."

Deepak Chopra

Mass & Heat Transfer



RANDOM PACKING AND INTERNALS

Metal, ceramic and plastic random packing in most standard shapes. Internals such as liquid distributors, hold-down grids, support plates and re-distributors.

Technical details:

Stainless steel, nickel alloys, monel, graphite and other exotic metals.
Plastic materials such as PP, PVDF, PVC, PTFE etc.



STRUCTURED PACKING & TRAYS

Wire mesh, metal sheet and high capacity structured packing. Conventional trays for operations where pressure drop limitations are not critical. In addition single floating or caged valves, bubble caps, bolts, nuts etc.

Technical details:

Structured packing: available in most stainless steels and other metals. Specific surface: wire mesh: 500-750 m²/m³, metal sheet: 65-500 m²/m³, high capacity: 250-500 m²/m³. All trays and spare parts available in carbon steel, stainless steels and titanium.



DEMISTERS & COALESCERS

Wired mesh-type droplet separators for more efficient gas separation. Typical separation is 99,5 - 99,9% and depends on the droplet size.

Technical details:

Available in stainless steels and most other metals, plastics such as PP, PVDF, PFA and others.



PRESSURE VESSELS AND COLUMNS

Production of pressure vessels, columns and reactors in a wide range of materials and sizes manufactured in Europe, USA and China.

Technical details:

Carbon steel and stainless steel, titanium, hastalloy, zirconium, etc.
All equipment in accordance with international certifications: ASME U stamp, PED, ISO9001, ISO14001 and others.



HEAT EXCHANGERS

Full range of heat exchangers covering blocks, plates and shell and tubes. Plate types include both gasketed and welded versions.

Technical details:

Available in many different materials, such as graphite, SiC, tantalum, zirconium, titanium, nickel alloys, stainless steel and carbon steel.

Reaction/Separation & Drying



GLASS-LINED AND METAL REACTORS

A glass-lined reactor is a cost-efficient solution for a pressure and corrosive resistant chemical reactor. Other materials such as steel alloys or reactive metal solutions (Ti, Ta, Zr) can be offered.

Technical details:

DIN range of glass-lined reactors of type AE, BE and CE covers nominal sizes from 63 l to 40 m³ and OPX (Optimix) range with three integrated baffles covers the same size range. Metal reactors are flexible in size and design.



CENTRIFUGES

Mechanical separation of solids from a liquid phase is a common unit operation and a centrifuge with a filter media cloth offers a way of doing so with efficient washing of the product cake and high throughput.

Technical details:

Continuous operation with a pusher centrifuge or operation in cycles with a vertical or horizontal peeler machine or a horizontal pharma centrifuge.



DYNAMIC CROSSFLOW FILTRATION

The DCF system works with overlapping rotating ceramic filter discs, which generate a turbulent differential flow of the feed towards the filter surface and minimize clogging.

Technical details:

High filtration throughput and handling of high viscosities compared to traditional TFF. Suitable for SIP and filtration in dead-end mode.



FILTER PRESS

For solid/liquid separation using the principle of pressure drive, provided by a slurry pump. Basic components are the frame, filter plate pack, closing device, and optional additional features.

Technical details:

Sizes 250 x 250 to 2,600 x 2,600 mm and filtration pressures up to 60 bar. Available from simple manual to fully automated equipment designs. Maximum degree of automation, also with extremely sticky filter cake.



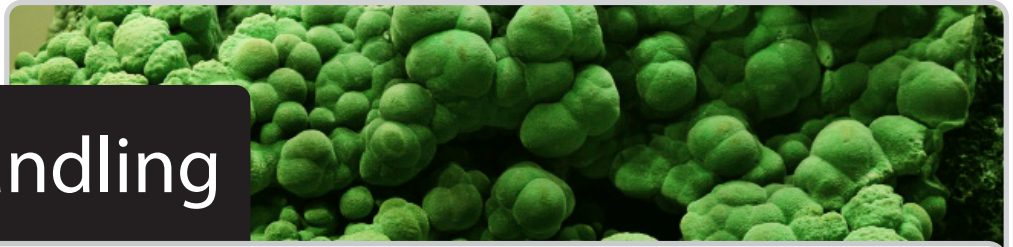
HELIX DRYER

For gentle thermal processing under vacuum at moderate temperatures. Gentle mixing by upwards conveying along the heated vessel wall by the helix and then down flow by gravity in the center of the vessel.

Technical details:

Available from laboratory and pilot scale to production in nominal volumes from 8 to 10000 L.

Powder Handling



VIBRO ENERGY SIEVES

There are occasions where you need to make sure that there are no impurities in your material and other occasions where you need to classify your product into different fractions. We have a full range of Vibrating Energy Separators and rotating inline security screeners.

Technical details:

Capacities from 1 kg/h to 50 t/h.



MILLING & SIEVING

Milling, micronizing and security screening of wet or dry ingredients and products is possible to do in a contained way, minimizing dust and product exposure by using in-line cone mills and sieves.

Technical details:

The mills/sieves can be connected with split valves or placed directly in-line for active transport through the equipment with vacuum transport systems. Capacities from 1kg/h to 100 t/h.



VOLUMETRIC & GRAVIMETRIC FEEDERS

Volumetric or Gravimetric Feeders for a high and safe feeding accuracy. They are used for powders, granules, fibres, flavours, pigments and liquids.

Technical details:

Feed Rates up to 45 m³ (volumetric), Feed rates from 0,2 dm³ (gravimetric). Robust, easy cleaning, high feed accuracy and low maintenance costs are some advantages.



EMPTYING AND FILLING

Emptying stations are used to automatically empty Big Bags and small sacks in a dust-free and safe way, while filling stations are used to automatically fill Big Bags - guaranteeing an operator-secure environment.

Technical details:

Stations in different materials, for different demands and different designs (hygienic version) for tailor made solutions are available.



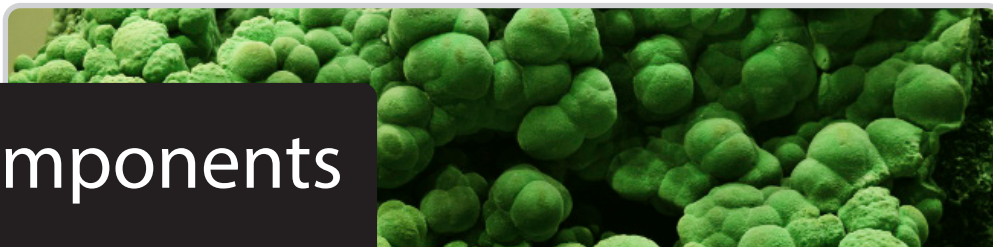
VACUUM & PRESSURE CONVEYING TECHNOLOGY

Simple and modular package vacuum & pressure conveying systems for dust-free conveying of powders, granules and most bulk solids.

Technical details:

Throughputs up to 6800 kg/h, cleaning in place are possible.

Process Components



PROCESS CARTRIDGE FILTERS

Filters provide security to your process and remove any unwanted particles from your process streams. The filter types vary from nominal rated depth filters to very highly controlled membrane filters.

Technical details:

Filter cartridges from 2.5" to 40" and pore size ratings from 0.1 μm up to 1000 μm are available. The materials vary from PP, PE, nylon and cellulosic materials (depth filters) to PTFE and PES membranes.



BELLOWS/COMPENSATORS IN PTFE

Bellows and compensators remove mechanical stress on piping and equipment and make installation procedures easier. Bellows made in PTFE are excellent for use in any pipelines for aggressive liquids or gases.

Technical details:

Standard sizes available in DN20 – DN600 with various flange sizes. Different models with internal and/or external reinforcements for full vacuum resistance and high pressure resistance.

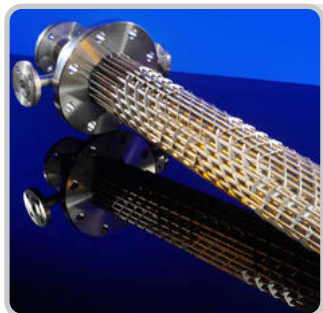


BURSTING DISCS

Properly designed and manufactured bursting discs offer your process equipment and piping an "engineered weak spot" to protect it from unexpected pressure variations. For corrosive processes, graphite bursting discs are a good alternative.

Technical details:

The discs come in a wide range of dimensions, materials and bursting pressures from very low pressures up to >5000 bar.



STATIC MIXERS

The static mixer is a good choice for mixing fluids and/or gases directly in the pipeline. The mixer has no moving parts, but uses the flow energy of the media to do the mixing.

Technical details:

Diameters from 3 mm to several m. Materials available are steels (inox, carbon steel, high-grade metals) and plastics (PTFE, PP, PE, PVC).



GLASS-/PTFE-LINED PIPING

Glass-lined piping offers cost effective means for corrosion-, and pressure resistant as well as vacuum resistant pipe lines.

PTFE/PFA-lined steel piping offers exceptional anti-corrosion features due to high performance fluorinated polymer applications: PTFE/PFA.

Technical details:

Available in a wide range of standard items, e.g. straight pipes, elbows, reducers, in nominal sizes from DN25 to DN300 (glass-lined), DN15 to DN600 (PTFE/PFA-lined). Special, customized pieces and jacketed pieces are also available.



SUPPLIERS

Chemical



Some equipment may not be available from Thurne Teknik in certain geographical areas.

SOLUTIONS WITH PROCESS UNDERSTANDING.

Thurne Teknik started already in the early 1960ies to build up a program with suppliers of Mass & Heat Transfer-, Reaction- and Powder Handling-equipment. Today, we still represent De Dietrich Process Systems (glass-lined reactors and borosilicate glass) and Sweco Europe (Separators).

During these decades we consistently worked on strengthening our delivery program: we added a wider range of materials for Reactors, completed our equipment for Powder Handling and enlarged our range of materials for Column Internals and Heat Exchangers. Appropriate components round off our systems and process equipments.

We are proud to present our partners below:



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