



# Three-Tec GmbH

Your partner for feeding systems,  
extruders, process equipment  
and special machinery

# THREE-TEC – YOUR PARTNER FOR HIGHEST QUALITY AND CUSTOMIZED SOLUTIONS

Three-Tec is the specialist for the development and production of feeding systems, extruders and process equipment in process technology. We offer our international customers from all demanding industrial sectors a comprehensive range of quality products, rounded off by competent advice and fast, reliable and individual service.

Thanks to the in-house development and manufacture of our products, we can offer our customers the highest quality standards and the greatest possible flexibility and are able to develop customized solutions. Our products are Swiss Made: They are developed and manufactured at our site in Seon AG.



### Swiss Quality

Highest quality standards are a matter of course for us



### Customized

Customized special solutions are our core competence



### Flexibility

We offer our customers the greatest possible flexibility and shortest response times



### Experienced

Thanks to our many years of experience, we can find the right solution for all requirements

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# Feeding systems

Our extensive product range includes a large number of feeding systems with screw diameters from 5 to 130 mm. From very small quantities starting at 5 g per hour up to several tons, a wide range of materials can be precisely fed. The performance of the equipment is particularly evident in the efficient feeding of poorly flowing powders. Both for gravimetric as well as the volumetric feeding, Three-Tec offers the appropriate devices incl. control system.

The sophisticated design allows assembly, disassembly and cleaning of all components in contact with the product in just a few steps and in a very short time. All components in contact with the product consists of stainless steel 1.4404 (AISI 316L) and can therefore be cleaned easily and efficiently with a wide range of liquids and solvents. Automated cleaning systems such as WIP (washing in place), CIP (cleaning in place) or SIP (sterilization in place) are available on request.

## HIGHLIGHTS OF OUR FEEDING SYSTEMS



**Efficient feeding**  
even of poorly flowing materials



**Various solutions**  
for gravimetric and volumetric feeding



**Quick assembly and disassembly**  
of all components in contact with the product



**Dismantling of the feeding screws**  
uncomplicated without tools



**Customer requirements**  
are implemented during development and production



**A wide range of throughputs**  
Smallest quantities from 5 g per hour up to several tons

## APPLICATION AREAS

### Pharma

- > Active ingredients
- > Auxiliary materials
- > Feeding to tablet presses
- > Multiple feeding systems
- > Volumetric feeding
- > Gravimetric feeding
- > Batch filling or continuous feeding



### Chemistry

- > Detergent
- > Minerals & mineral substances
- > Fertilizer
- > De-icing
- > Toner
- > Dust & pollen
- > Ceramics
- > Cosmetics
- > Metal powders & heavy flowing powders



### Food & Pet Food

- > Cereals
- > Pet food, fish food
- > Food supplements
- > Flavours
- > Textured vegetable protein & meat analogues
- > Powdered drink
- > Flour, starch & bakery ingredients



### Plastics

- > Granules
- > Masterbatch
- > Recycling



## FLAT-TRAY FEEDERS

Three-Tec's flat-tray feeders guarantee precise volumetric and gravimetric feeding of good to poor-flowing, moist or bridging products with flowabilities of ffc 1 - 5. All flat-tray feeders can be supplemented with a scale and control system at any time and operated as a gravimetric «Loss in Weight» or «Gain in Weight» and as a continuous system, or used for batch filling.

The flat-tray feeders are equipped with easily exchangeable feeding tools. Various feeding tools such as auger, concave or spiral screws facilitate adaptation to the product to be fed.

### Features

- > Precise feeding even with complex product behavior
- > Can be extended with scales and weighing electronics to convert it into a gravimetric device
- > Various feeding tools such as auger, concave or spiral screws facilitate adaptation to the product to be fed
- > Very easy to clean
- > Consistent feeding thanks to gentle conveyance of the bulk material
- > Feeding tools easy to replace thanks to bayonet fasteners
- > Wide-open screw channel for optimum product intake and maximum screw fill level
- > Very small residual quantities when fed until empty

## FEEDING DEVICE WITH INTEGRATED LOAD CELL

The two feeder types ZD 5 i6000 and ZD 9 i10000 are also available with integrated load cells instead of the platform scale. The all-in-one solution makes the feeder smaller, lighter (only 5 kg) and easier to handle and thus easier to position.

Due to the low drop height, the feeder has a lower susceptibility to external disturbances such as drafts or vibration. The lower device weight also significantly improves the accuracy of the weighing system.



Flat-tray feeding systems with gravimetric control



Gravimetric flat-tray feeder ZD 12 FB Pharma



Flat-tray feeder with tray scraper



Flat-tray feeder ZD 5 FB i6000

## TWIN AND SINGLE SCREW FEEDERS

Twin and single screw feeders allow precise volumetric and gravimetric feeding of well-flowing powders, granules, micro-granules, grain, pellets, chips, flakes and short fibers.

All standard feeding units can be upgraded with a scale and weighing electronics at any time and operated as gravimetric «Loss in Weight» or «Gain in Weight» as well as a continuous system or used for batch filling. The flat-tray feeders are equipped with easily exchangeable feeding tools. Various feeding tools such as auger, concave or spiral screws facilitate adaptation to the product to be fed. The horizontally rotating bridge breaker prevents the product from bridging in the hopper and allows the bulk material to flow permanently into the feeding screws. For free-flowing bulk solids without a tendency to bridge, units are also available without bridge breaker.

The «Quick Clean» type version was developed for fast, contamination-free product changes. The connections between the hopper, gearbox, lid and outlet pipe are designed with quick-release fasteners and enable tool-free disassembly and assembly of all components in contact with the product in the shortest possible time. By simply loosening the quick-release rings, the hopper can be removed in one piece together with the feeding screws and the discharge aid or bridge breaker. A second hopper can be fitted so that a different product can be fed immediately and without cleaning.

### Features

- > Precise volumetric and gravimetric feeding
- > Extension with scale and weighing electronics possible
- > Feeding screws easy to replace thanks to bayonet locks
- > Various feeding tools such as auger, concave or spiral screws facilitate adaptation to the product to be fed
- > Easy to clean and easy to disassemble
- > Available with and without bridge breaker



Volumetric single screw feeder ED 65



Single screw feeder ED 20 with counter weight scale (Gain in Weight)

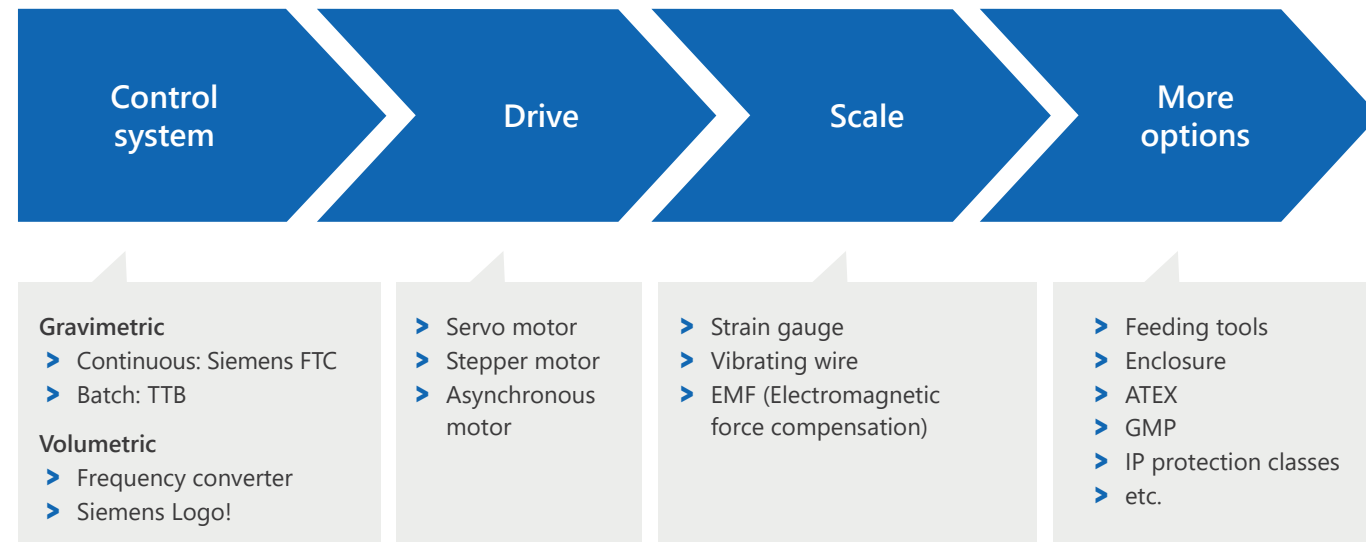


Twin screw feeder Quick Clean ZD 12 TQ



## OPTIONS

At Three-Tec you can put together your feeding system according to your needs. You can choose from various controls, drives and scales. In order to configure the feeding system perfectly for the respective process, Three-Tec offers a wide variety of options:



### Feeding tools

With the right feeding tool, you adapt your feeding device exactly to the product and thus achieve the best results. In addition to standard feeding tools, we also manufacture special screws from 5 mm to 130 mm screw diameter, single-, double- or multi-flight, linear, conical progressive or relief ground.



### Scales

The required feeding accuracy and the process environment determine the system design and also the required weighing technology. The platform and hopper scales from Three-Tec are equipped with analogue strain gauge or digital high-precision load cells.

### Control system

Gravimetric control systems are equipped with hardware components from Siemens.

### Hoppers

Feeding hoppers are available in a wide variety of sizes and shapes depending on customer requirements. Choosing the right hopper, suitable for the properties of the product to be fed, guarantees optimal feeding.



### Outlet pipe

Depending on the application and process requirements, vertical or horizontal discharge tubes can be mounted. The connection to customer systems can be adapted and prepared.

### Ionisation

To prevent static charge and adhesion of certain products to the walls of the containers or tubes, they are ionized during hopper refilling or discharge.

### Drive

Three-Tec feeders are available with either one or two drives. In the case of single-motor units, the bottom scraper or bridge breaker and feeding screws are driven via a gearbox; in the case of twin-motor machines, the bottom scraper or bridge breaker is driven via a separately controlled motor. Depending on the application or customer requirements, stepper, AC, DC, servo or torque motors are used.



### Enclosure

For special applications in the pharmaceutical industry the drive is completely enclosed and ventilated with compressed air.

### Bellows

In order to avoid interference with gravimetric systems due to dust protection, bellows are as flexible connections.



### Dust cover

Filters prevent dusty products from escaping when refilling the feeding hopper or vertical discharge pipes. At the discharge pipe, dusty product can be sucked off and conveyed back in the feeding hopper.

### More options

- > Seals with purge gas connection
- > Dust tight +/- 50 mbar
- > Gas-tight
- > Flow inhibitor
- > Extension of discharge pipe and feeding tools
- > Counter bearing of the feeding tools
- > Surface treatments according to customer requirements
- > ATEX executions



# Extruders

The extruders from Three-Tec are characterized by a compact design, a high torque and an intuitive operation via touch panel. They are available with various screw diameters from 5 to 100 mm and can process smallest quantities from 1 gram as well as throughputs of up to 2 tons per hour.

Our laboratory extruders, which we have been developing and producing since 2005,

are among the most world's smallest devices. Through the compact and user-friendly construction, the total cost per test is significantly lower than for other devices.

Special customer requirements can be realized at short notice thanks to Three-Tec's flexible approach and extensive know-how.

## HIGHLIGHTS OF OUR EXTRUDERS



### Screw diameter

different screw diameters (5 to 100 mm) and L/D ratios (15:1 to 60:1) available



### Quick assembly and disassembly

Tri-clamp and bayonet connections enable a higher sample throughput



### Easy cleaning

designed for easy cleaning and simple cleaning validation



### Temperature gradients

Steep temperature gradients between segments are possible due to deep cuts in the barrel



### Compact and lightweight

Due to their small size and light weight, the laboratory extruders are easy to transport



### Low active ingredient requirement

Laboratory extruders with low active ingredient requirements enable smallest approaches from 1 gram

## APPLICATION AREAS

### Pharma

- > Amorphous solid dispersion (ASD)
- > Formulation development
- > Continuous processes
- > High-precision feeding of active ingredients
- > Film extrusion (oral, dermal)
- > Implant production
- > Clean room applications
- > Pharmaceutical 3D printing



### Chemistry

- > Polymer production
- > Mechanochemistry
- > Colors & inks
- > Reactive extrusion
- > Extraction
- > Battery production
- > Fertilizer
- > etc.



### Food & Pet Food

- > Vegetable proteins
- > Dairy products & milk powder
- > Flour & starch
- > Drinks
- > Chocolate & confectionery
- > Meat substitute
- > Pet & fish food
- > etc.



### Plastics

- > Compounding
- > Bio-materials
- > Recycling
- > Processing of plastics
- > Fiber-reinforced plastics
- > Film extrusion
- > Filament for 3D printing
- > etc.





UTILISATION

Multifunction extrusion from small quantities to production scale for research and development as well as production applications. Extrusion results are optimally suited for upscaling or downscaling. The extruders perform complex extrusion tasks under difficult conditions such as high pressure, high torque or steep temperature gradients. The extruders are equipped with easily exchangeable tools, which are individually structured and adapted to the extrusion task by different segments such as conveying, return conveying, kneading or

mixing segments. The temperature profiles of the heating zones and the torque profile of the motor are recorded and can be read out via USB or Ethernet interface.



Advantages of our extruders

- High mixing effect
- Short residence time
- Steep temperature gradients possible
- Scale up suitable
- Continuous process
- High active ingredient content
- Intuitive operation via touch panel
- All parts in contact with the product are made of stainless steel
- Easy data output thanks to USB connection, further communication options via PROFINET or OPC UA
- Simple barrel mounting with only one clamping ring, which withstands high loads
- Barrels can be produced completely according to customer requirements (heating and cooling zones, sensor technology, degassing, etc.)



Twin screw extruder ZE 24 HMI

TECHNICAL DATA EXTRUDER PRODUCTION

	ZE 18	ZE 24	ZE 32	ZE 50	ZE 77	ZE 100
Max. torque (Nm)	60 (30/screw)	120 (60/screw)	according to customer requirements			
Max. temperature (°C)	230 (optional 400)					
Cooling	water / air or water / air mixture					
Heating zones	1 to 12					
Rotational speed (rpm)	0–300, optional –1'000					
L/D	20, 25, 30, 40, 50, 60 or according to customer requirements					
Weight (kg) *	≈ 150	≈ 200	≈ 1'000	≈ 2'500	≈ 3'500	≈ 8'000
Throughput (kg/h) **	10	50	150	500	1'500	4'000
Drive	low-noise servo motor with constant torque over the entire speed range					

\* The specifications are variable depending on additional equipment  
\*\* Throughputs measured with Soluplus. Since the throughput is highly product-dependent, the data should be regarded as theoretical values.

LABORATORY EXTRUDERS

With screw diameters starting at 5 mm, our miniature-scale laboratory extruders are among the world's smallest devices. Due to the compact and user-friendly design, the total costs per test are significantly lower than with other devices. Thanks to the small and compact design, the laboratory extruders can be set up and used quickly at changing locations.



Twin screw laboratory extruder ZE 12 HMI

TECHNICAL DATA LABORATORY EXTRUDERS

	ZE 5	ZE 9	ZE 12
Max. torque (Nm)	2.5 (1.25/screw)	14.5 (7.25/screw)	20 (10/screw)
Max. temperature (°C)	230 (optional 400)		
Cooling	water / air		
Rotational speed (rpm)	0–300, optional –1'000		
L/D	15, 20, 25, 30, 40, 50, 60		
Weight (kg)	≈ 60	≈ 68	≈ 70
Throughput (kg/h) *	0.4	1.2	2.5
Drive	low-noise servo motor with constant torque over the entire speed range		

\* Throughputs measured with Soluplus. Since the throughput is highly product-dependent, the data should be regarded as theoretical values.

LABORATORY EXTRUDER HYBRID

For particularly efficient application, we have developed the parallel twin-screw laboratory extruder Hybrid. Like our proven standard extruders, it is designed as a table-top version. As a combination unit, however, it additionally offers the choice between two different extruder sizes. Three variations are available, each with two selectable screw diameters (5, 9 or 12 mm).

Thanks to an empty volume of only 1.2 cm³ with a 5 mm screw diameter (L/D ratio 15) – the smallest of its kind in the world – the laboratory extruder hybrid has a very low active ingredient consumption. This makes it possible to produce very small batches from as little as 1 gram. Since only very small residual amounts remain in the extruder, a high yield can be achieved with the substances available. The results can also be used opti-

mally for reproducible scaling.  
Thanks to the universal use of heating cartridges, cooling systems, die plates, pressure and temperature sensors, the unit offers the flexibility to convert from a 5 mm to a 9 or 12 mm screw diameter within a few minutes.



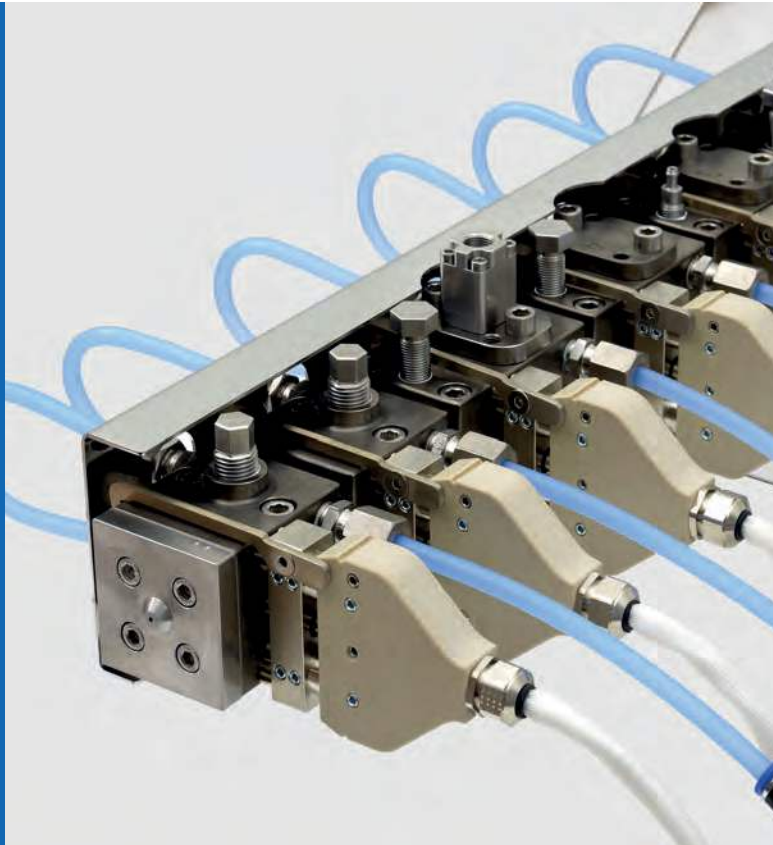
# OPTIONS AND ACCESSORIES

## Barrels

The extruder barrels are manufactured entirely in-house at our site in Seon. Customer requirements can thus be taken into account flexibly and easily.

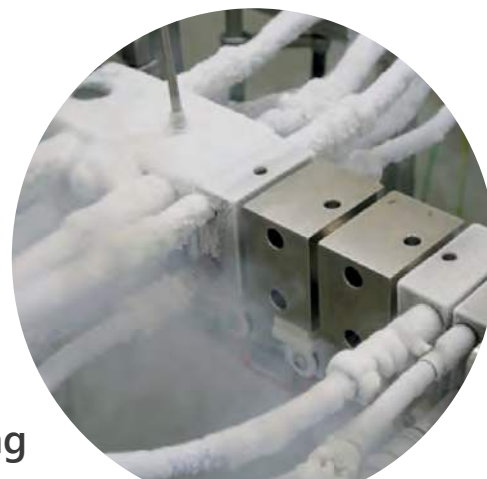
Advantages of Three-Tec extruder barrels:

- Configuration completely according to customer requirements
- Barrel in one piece or split
- Different process lengths available and interchangeable at any time
- Compact, weight-saving design
- Free-standing barrel offers dispensing and sensing capabilities from all four sides



Heating

The heating elements of the Three-Tec extruders can be mounted easily, quickly and without tools. Due to the high power and the large contact surface, an optimal temperature transfer and thus a fast heating takes place.



Cooling

Cooling is performed per individual barrel zone. It is possible to operate the cooling manually or to regulate it via the extruder control system using solenoid valves. Water, air or liquid nitrogen cooling are available.

## Screw diameter from 5 to 100 mm

The extruder screws are configured customer-specifically based on the process task and manufactured in-house. Three-Tec offers the following types of screws:

- Standard screws (made from one piece)
- Modular screws (interchangeable screw segments)
- Monobloc screws (demanding screw geometries, made from one piece)

A wide range of screw segments for conveying, kneading, compacting, stopping, relaxing and mixing is available.



## Dies

The dies are defined and manufactured according to customer and process requirements. The following die geometries are possible:

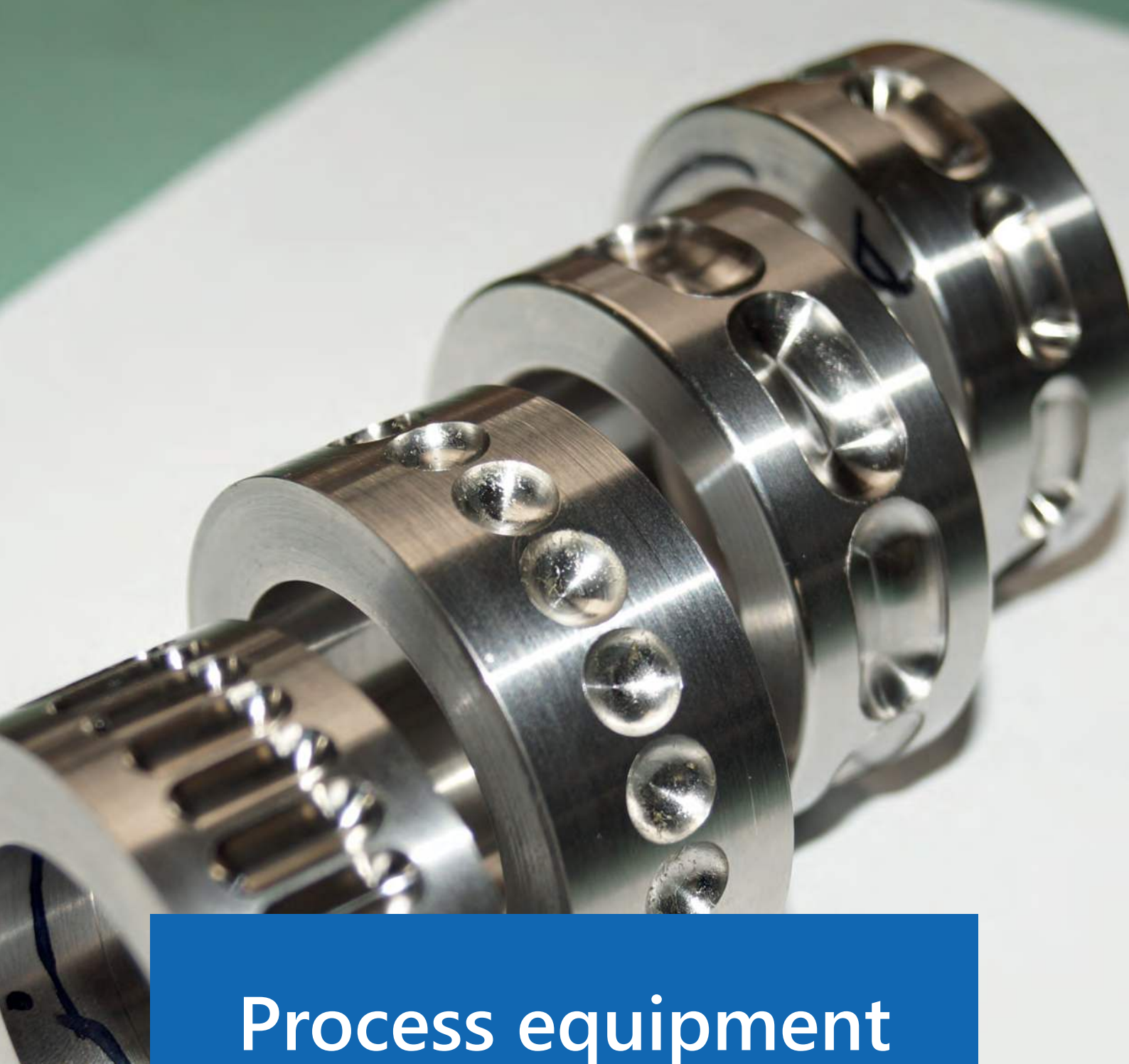
- Single and double dies
- Sieve dies
- Film dies (fixed or adjustable)
- Hose dies
- Cooling dies for meat substitutes



## Control system

- Input of parameters via touch panel or alternatively via Ethernet connection
- Real-time monitoring of various process parameters
- Trend plot and recording of process parameters
- Export of recorded data as CSV file via USB connection
- Additional devices controllable (feeding, conveyor belt)





# Process equipment

In our process equipment range, our customers will find a wide selection of peripheral devices to cover all their needs. All products are manufactured at our site. This allows us to guarantee the highest quality and to respond to customer requests individually and promptly.

- > Pelletizer
- > Hot cutter
- > Spheronizer
- > Conveyor belt laboratory
- > Cooling conveyor belt
- > Cooling bath
- > Film roller
- > Filament winder
- > Calender
- > Chill Roll
- > Stuffing feeding device
- > Side feeding device

## Pelletizer



The pelletizer can be used to process strands into granules. The speed of the feed roller and the cutter are independently adjustable. This allows the extrudate feed to be perfectly matched to the extrudate and the pellet size to be adjusted between 0.5 and 10 mm during processing.



Food



Pharma



Laboratory



Research & Development

## Hot cutter



With the hot cutter, the extrudate can be reliably processed into pellets or granules with one or more knives in direct contact with the die plate. Both wet and melt extrudates can be processed. The number of knives used and the speed setting allow the production of pellet lengths or pellet sizes between 0.5 and 5 mm.



Food



Pharma



Laboratory



Research & Development

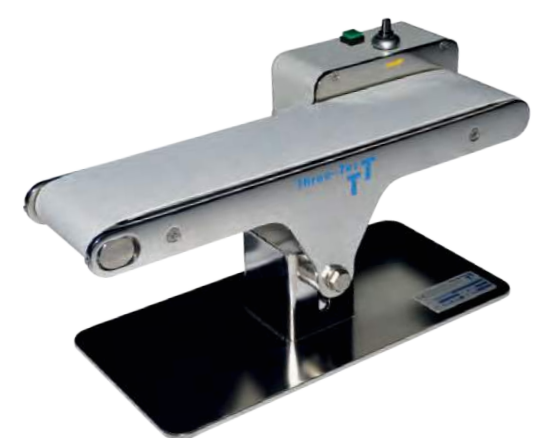
## Spheronizer



The Spheronizer is used for reducing the length and rounding off fine extrudate strands. The desired geometry of the end product is influenced by the batch size, the speed and the surface structure of the friction disc. Depending on the container size, a batch quantity of 5 to 2,000 grams can be processed.



# Conveyor belt laboratory



The conveyor belt is suitable for gentle removal and cooling of the extrudate. In order to achieve more efficient cooling of the extrudate, a cooling tank can optionally be integrated on which the belt rests and is continuously cooled. This enables the haul-off of extrudates with a temperature of up to 300 °C. The belt speed can be variably adjusted between 0 and 15 m/min.

- Food
- Pharma
- Laboratory
- Research & Development

# Cooling conveyor belt



The cooling conveyor belt is suitable for the gentle removal and efficient cooling of extrudates and granules. The conveyor belt rests on actively cooled cooling elements and is permanently cooled during operation. Air connections in the lid of the cooling conveyor belt allows additional air cooling of the product. The belt speed can be variably adjusted between 0 and 20 m/min.

- Food
- Pharma
- Laboratory
- Research & Development

# Cooling bath



The cooling bath in different lengths and designs is used for efficient cooling of various extrudates before further processing by means of a winder or pelletizer. It is equipped with holding-down bars or holding-down rollers and scraper brush and mounted on damping elements. The water can be drained via a valve. In our larger cooling baths, a cooling unit can be connected and the water level is adjustable.

# Film roller



The film roller from Three-Tec enables the calibration of flat extrudates. Furthermore, round extrudates can also be rolled into a film with a defined thickness. Subsequently, the product is evenly wound onto a spool. The film roll consists of an adjustable and temperature-controlled pair of rolls, an adjustable pair of tension rolls and a rewinder, or spool.

- Food
- Pharma
- Laboratory
- Research & Development

# Filament winder



The filament winder from Three-Tec is suitable for winding the extrudate onto a spool. The tensile force between the take-off roller and the spool is adjustable, which enables very uniform winding. In addition to round strands, the winder can also be used to wind ribbon-shaped extrudates onto a spool. The filament winder is controlled by means of an integrated potentiometer.

- Food
- Pharma
- Laboratory
- Research & Development

# Calender



The calender from Three-Tec is a versatile laboratory device which, in combination with a hot melt extruder, can be used to continuously produce tablets directly from the still hot extrudate. Since only a short preparation time is required and the process can be started with the input of a few parameters, the production of 10,000 tablets within one day is possible.

- Pharma
- Laboratory
- Research & Development



## Chill Roll



The cooling roller is suitable for the efficient and continuous cooling of extrudates from approx. 3 kg/h to approx. 100 kg/h. The cooling roller picks up the product from the extruder die, distributes it over almost the entire belt width and cools the material reliably and quickly in direct metal contact. Thanks to our unique concept with the extra large wrap angle of the belt on the cooling roller, even extrudates with a very high heat capacity or particularly high throughputs can be cooled many times more efficiently and with a comparably small device.

## Stuffing feeding device



Stuffing feeding devices are used for the reliable feeding of very poorly feedable or very cohesive and very light products into an extruder. With the stuffing feeding device, products are pressed into the barrel of the extruder from above. Three-Tec manufactures stuffing feeding devices for all extruder sizes and throughput ranges.

## Side feeding device



Side feeding devices are used for the forced feeding of powders, granules or fibres into an extruder. This improves product quality and increases the throughput of the extruder, as well as processing additives gently. Three-Tec manufactures side feeding devices for all extruder sizes and throughput ranges.



## Special machinery

Three-Tec develops and manufactures a wide variety of special machinery according to customer requirements. Thanks to our many years of experience, we can find a suitable solution for every requirement. Examples of special machinery that Three-Tec has manufactured:

- Isolator High Containment
- Filling systems
- Multiple feeding system for the pharmaceutical sector
- Four screw feeding system with flat-tray
- Feeding system with integrated dust extraction
- Battery production feeding systems completely insulated
- Feeding extruder combination unit with flat-tray feeding
- Feeding system without metal contact of the feeding material



# ISOLATOR HIGH CONTAINMENT

A complete production line in high containment according to ISO 14644-7: a feeder, an extruder, a conveyor belt with cooling and a pelletizer are integrated in the isolator. This means that the process from powder mixing to the finished granulate takes place in a protected and controlled environment, which eliminates the need to set up a complete clean room. The equipment can also all be removed individually from the isolator. This frees up space for other machines or applications as needed. The isolator thus becomes a multi-purpose device.

The built-in machines are specially designed for handling with gloves and can be easily disassembled and cleaned by only one operator. The working chamber as well as all product-contacting parts of the machines



integrated in the isolator are made of stainless steel 1.4404 (316 L) with a surface finish of  $Ra \leq 0.8 \mu m$ .

## Features

- > Project specific design
- > Integration process equipment
- > Integration transfer systems
- > Contamination-free filter change systems
- > Generous free space for further process steps and peripheral devices



# FILLING SYSTEM

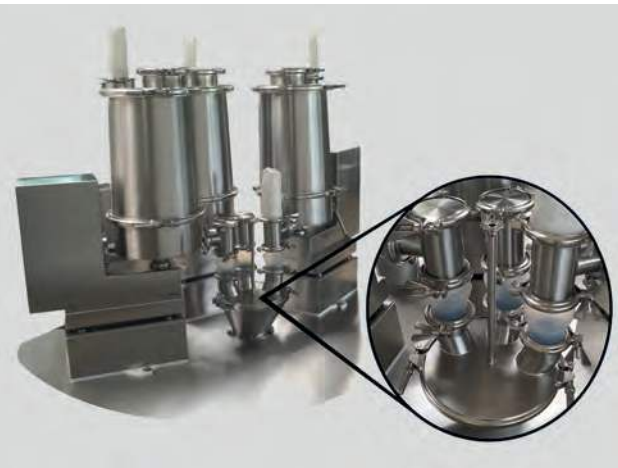
The filling system shown was developed and produced at the request of a customer for whose old equipment spare parts could no longer be supplied. With a simple system that convinced both the planners and the users, Three-Tec was able to replace the old equipment.

The filling system manufactured by Three-Tec achieves a filling capacity of 60 cans of 1 kg and 1.5 kg per minute, which is double the output of the previous system. In addition, the dosing accuracy has been improved from 2 to 0.5 % and dust emissions have been virtually eliminated compared to the old system. Thanks to the user-friendly control system, start-up times have been significantly reduced. Overall, productivity on the line has been significantly increased.



# OTHER SPECIAL MACHINERY

Other special machinery is developed and produced upon customer request. Some examples of special machinery that Three-Tec has produced:



Multiple feeding system for the pharmaceutical sector



Four screw feeding system with flat-tray



Feeding system with integrated dust extraction



Battery production feeding systems completely insulated



Feeding extruder combination unit with flat-tray



Feeding system without metal contact of the feeding





## Services

In addition to products with the highest quality standards, we offer our customers a wide range of additional services:

- Individual consulting & support
- Individual development according to customer requirements
- Feeding and extrusion tests in the internal test laboratory
- Commissioning and acceptance in house or at the customer's site
- Regular maintenance of the equipment
- Individual development and programming of complete control systems
- Short delivery times of spare parts due to internal production and warehouse
- Complete documentation
- Introductions and training on our products

## TEST LABORATORY

In our test and application laboratory, we offer our customers the perfect environment to optimise or develop existing and new processes. Our laboratory is equipped with various devices ( feeding systems, extruders and process equipment) from our wide range of products. Once you have told us your requirements for your process, we will put together the appropriate equipment and carry out the test with your product in our laboratory. We then provide you with photos, videos, a test report and, if required, product samples. If you wish, you can follow the tests on site or by video call so that you can see directly what is happening.

In addition to process development, we also carry out feasibility studies in our test laboratory or produce initial product samples for your customers. Contract manufacturing is also possible on request.

### The range of services in our test laboratory

- Gravimetric and volumetric feeding
- Extrusion: Melt extrusion, wet and melt granulation, roasting and mixing processes, food extrusion, gas and solvent extraction processes
- Mixing
- Contract manufacturing
- Process development
- Feasibility studies
- Contract manufacturing





# HOW YOUR THREE-TEC DEVICE IS CREATED

Only with the right process, high-quality products and precisely fitting individual parts, the best feeding and extrusion results can be achieved. We offer our customers everything from a single source so that they receive the perfect product for their needs: From feasibility tests in our test lab to the development, production and programming of the devices to maintenance and support. Most of our devices are developed and produced according to specific requirements of the customers especially for their purposes and are unique pieces.



## 1. Your requirements

You tell us your requirements, we advise you individually and together we find the right solution.



## 2. Tests

Together, we conduct tests in our test lab with your original products to accurately define the device.



## 3. Development

Our specialists develop the feeding device or extruder according to your requirements using AutoCAD Inventor 3D and create an acceptance drawing.



## 4. Manufacturing & assembly

In our workshop all parts are made of high quality materials and are assembled by specialists.



## 8. Spare parts & maintenance

We guarantee the availability of spare parts for at least 10 years from purchase and service your device worldwide.



## 7. Documentation

You will receive detailed documentation from us for your device according to your requirements.



## 6. Commissioning

The commissioning of the device is carried out either at our premises or at the customer's site, depending on the customer's wishes.



## 5. Control system

The careful construction of the control system is carried out in-house, as is the individual programming.



# About us

Three-Tec is the specialist for the development and production of feeding systems, extruders and process equipment in process technology. Our family-owned company, now in its second generation, was founded in 2000, employs about 50 people and is based in Seon AG in Switzerland.

We offer our international customers from all demanding industrial sectors a comprehen-

sive range of quality products, rounded off by competent advice and fast, reliable and individual service. The distribution is carried out by independent, experienced sales organizations. We strive for long-term cooperation with our customers, suppliers and employees and value them as important partners.

## GLOBALLY PRESENT

Devices from Three-Tec are used by our customers in 40 countries on six continents. Customers from all demanding industries and the research and development sector rely on Three-Tec's high-quality devices: Our customers are active in the pharmaceutical industry, medical technology, food industry, cosmetics industry, chemicals and plastics production, building materials industry, power generation, battery

production, tobacco industry and recycling industry. In addition, we can count many universities, colleges and testing laboratories among our customers. We manufacture many devices specifically according to the requirements of our customers.

Discover a selection of our customers on our website at [www.three-tec.ch/references](http://www.three-tec.ch/references).



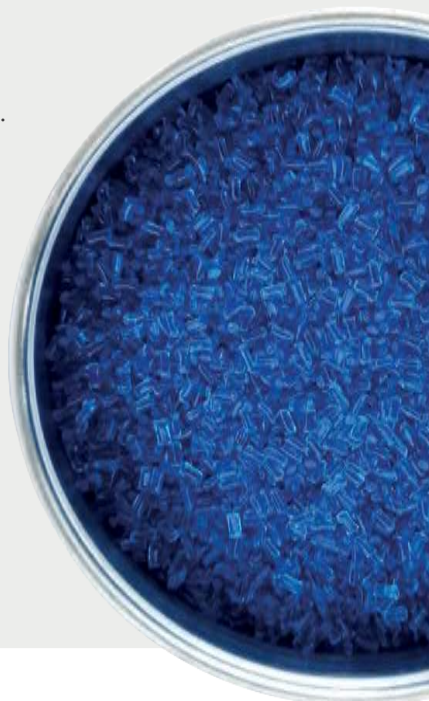
## DISTRIBUTION

With our own sales organization, we distribute our products worldwide. In some countries, selected partners take over the distribution. On our website you will find the contacts of our partners and their sales regions under [www.three-tec.ch/contact](http://www.three-tec.ch/contact).

## MATERIALS

We find solutions for feeding and extrusion of all materials. A selection of the materials processed with devices from Three-Tec:

- > Active Pharmaceutical Ingredients (API)
- > Polymers such as EUDRAGIT®, Kollidon, Solupus, EVA, Shin-Etsu AQOAT®
- > Synthetic polymers such as polylactides (PLA), polyamides (PA), polyethylenes (PE), etc.
- > High density polyethylene (HDPE)
- > Biopolymers such as thermoplastic starch
- > Paraffin
- > Lactose, microcrystalline cellulose
- > Film coating like Kollicoat®
- > Ceramic materials
- > Metallic powder
- > Vegetable proteins for meat analogues
- > Expanded snack products and pet food





## CERTIFICATIONS & GUIDELINES

### ATEX (explosion protection)

Our equipment can be certified for all categories according to customer requirements in compliance with the ATEX Directive 2014/34/EU:

Devices for zone 2/22 and 1/21

Devices for zone 0/20 on request

### CE

Our devices meet the requirements of EC Regulation No. 765/2008.

### FDA

All plastic parts and seals in contact with the product that we use for our devices meet the requirements of the Food and Drug Administration (FDA) and are therefore FDA compliant. The greases and lubricants used are certified according to NSF-H1. At the customer's request, we document all FDA relevant parts used and compile a clear list with the corresponding FDA certificates.

### Parts in contact with the product

Stainless steel, Pharma Grade 1.4404 (AISI 316L) or according to customer specification.

### Seals

PTFE, silicone, all seals are FDA suitable according to standard CFR 21 177-2600 and regulation EC 1935/2004.

### Surface treatment

Different surface treatments are carried out according to customer requirements.



### GMP

Production is carried out in accordance with GMP guidelines including documentation.

### IP protection class

As standard, our devices are protected according to IP 54: Protection against dust in damaging quantity as well as protection against splash water from all sides. We can offer higher protection classes on request.

### ISO

Three-Tec operates in accordance with the ISO 9001:2008 quality standard and is currently in the process of obtaining ISO 9001:2015 certification.

### Material certificates EN 10204

For all stainless steel parts in contact with the product, test certificates can be issued according to customer requirements. You can choose between the works certificate 2.1, the tool certificate 2.2 or the acceptance test certificates 3.1. In the case of test certificates 2.1 and 2.2, we document all stainless steels that come into contact with the product; in the case of acceptance test certificate 3.1, we also prepare a clear list with the associated material certificates.

### NAMUR NA 40 (dosing accuracy)

To achieve reproducible dosing results, Three-Tec adheres to the NAMUR worksheet NA 40 «Dosing accuracy of continuous scales».

### Roughness measurements / protocols

At the customer's request, we carry out roughness measurements of the elements in contact with the product and prepare a clear report.

## CORPORATE CULTURE

Three-Tec delivers quality products combined with competent advice and fast, reliable service. Even after the completed order, we are there for our customers and partners. Partnership-based, long-term relationships with suppliers and customers, which are characterized by respect and trust, enable short decision-making processes and rapid and cost-optimized order processing.

As a family business, our employees and their development opportunities are close to our hearts. We see them as capable people and encourage them to help shape our company, to take on responsibility and competencies within the scope of

their abilities and to develop individually. For this purpose, we offer them a varied and challenging range of tasks and progressive working conditions. To achieve our goals, we work with flat hierarchies and a flexible organization.

Three-Tec is strongly committed to vocational training for young people. We train apprentices who are fully integrated into production at an early stage and can thus take on responsibility and work independently at an early stage. In addition, we offer motivated people the opportunity to start their career with an internship or a trial apprenticeship.



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## CONTACT

We look forward to hearing from you. You will find direct contact persons for your concerns and further contact options on our website under [www.three-tec.ch/contact](http://www.three-tec.ch/contact).