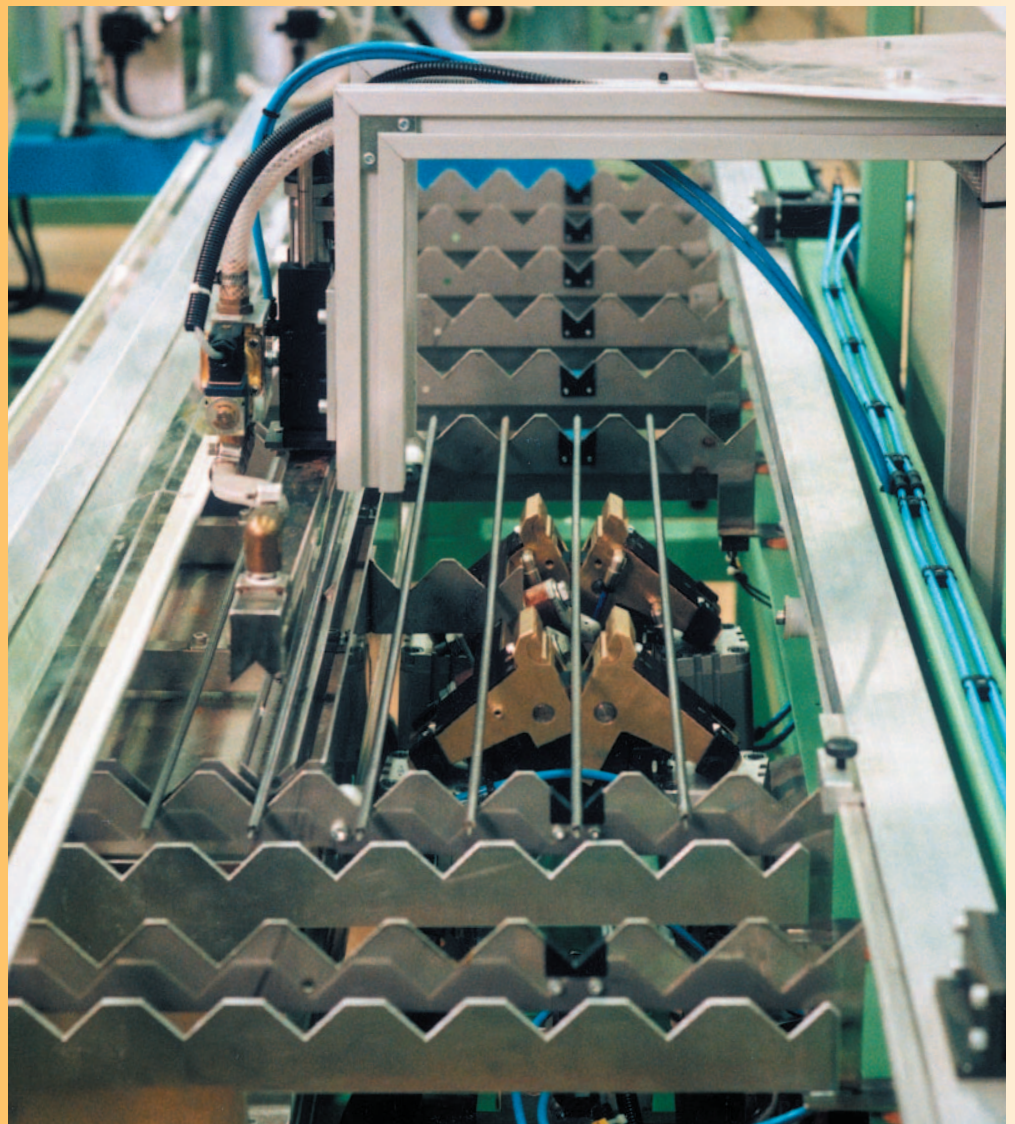


Anneal the element right on the spot



Granlund KOE spot annealing equipment. Specially designed to soften the material only at the spot where the actual bend is to be made. Fast and convenient. Saves energy. Fully automatic. Easy to operate and service. Easy to adjust.

Spot annealing equipment

The GRANLUND KOE spot annealing equipment consists of a transport table with feed belt and walking beam system, transformer for six different voltages and a thyristor control. The annealing time and amperage can be set from the control panel.

Fast and convinient

Tubular elements in copper, stainless or mild steel in diameters up to 12 mm can be annealed.

Fully automatic

The element comes from the reducing rolling mill along a path where it activates a sensor, which gives an impulse to a pneumatic cylinder to push the element down into the water cooled annealing jaws.

The power comes on and a timer is activated.

When the preset time is reached, the element is ejected on to a cooling path.

The entire sequence is fully automatic.

Saves energy

As only a small section of the element is annealed, the energy cost can be kept to a minimum. As the annealing section is normally located away from the ends, the element can be finally end-sealed when leaving the filling machines.

Easy to operate and service

The equipment does not require a technically qualified operator as the annealing data can easily be set on the transformer and control panel.

Easy to adjust

The annealing length is adjustable from 180 - 600 mm. The positioning of the annealing spot on the element can be adjusted by moving the stop on the conveyor path. Adjusting time is variable but is between 5 and 15 minutes.

Granlund Machinery

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10. ANNEALING KOE, furnaces

Annealing can be made by several principles, e g by:

- convection heating
- resistance heating
- induction heating

Using convective heat would mean annealing the tubular element is in a belt furnace. This kind of furnace is available in capacities of 18 kg/h to 300 kg/h. However, the capital investment in such a furnace is rather high and the furnace has to be fed and operated more or less manually. It also requires a lot of space. GRANLUND can supply furnaces for bright annealing (the elements are annealed in a protective atmosphere of cracked ammonia or H_2+N_2 from bottles), or black annealing (propane or natural gas from gas generator or mixed gas from bottles).

(Furnaces for bright annealing normally has to run to appr. two days before a good bright results is obtained. Practically, this means that these furnaces has to run continuously.)

As an alternative, GRANLUND Machinery market a spot annealing equipment, using resistance heating, called KOE. The spot annealing equipment only anneals the element where it is required. It operates in line with the rolling mill or length compensating mill. The additional space is only two times the maximum element length and the handling is done quite automatically.

The KOE can also be placed in line with a machine for plug pulling, cutting and deburring of pins. The element is oxidized during annealing, but the oxidation can be limited thanks to short annealing time.

Inductive heat represents a third alternative.

This information, which may be subject to change, is offered solely for your consideration, and should not be taken as a warranty or representation for which we assume any legal responsibility.

Sales Catalogue

KOE Spot Annealing Equipment

- easy to control
- saves energy
- fast response
- fast operation
- in line operation
- friendly to the environment

Construction

The machine is built up of four units:

- transformer
- control panel
- annealing device
- water colling device

Function

The element is fed onto a conveyor belt, which runs with the same speed as the rolling mill. On the side of the belt, there is a movable micro switch. When this switch is activated, the element is pushed down onto the annealing jaws, and annealed by resistance heating.

As soon as the element is in position, the annealing jaws goes down and clamps the element. The jaws are energized and annealing takes place. After annealing, the element is pushed out of the jaws and falls onto a walking beam system with a cooling path.

There are three parameters to be set:

- voltage
- current
- time

The parameters are set based on experience. Some general values for stainless steel and copper are available:

Copper tube Ø8,0 x 0,6 mm

annealing length	200 mm	time	5 s
temp	600-800°C	transformer setting	7,5 V

Stainless steel tube Ø8,0 x 0,6 mm

annealing length	200 mm	time	5 s
temp	1100°C	transformer setting	30 V

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Sales Catalogue

Technical data

Total height	1500 mm
Total width	3000 mm (incl control panel and cooling path)
Total length	3500 mm
Weight	1200 kg
Annealing length	adjustable 150/180 to 600 mm (takes 5-15 min to adjust)
Element length (that can be transported)	800 - 3000 mm
Tube diameter	Ø6 - 12 mm (tools need to be changed)
Heating time	adjustable 0 - 999 seconds
Transformer (depending on use, this is standard version):	
Primary voltage	400 V / 50 Hz
Secondary voltage	30-22,5-15-10,2-9,2-7,5 V (set by selector switches)
Rating	45 kVA

The KOE can also be placed in line with a machine for plug pulling, cutting and deburring of pins.

Required information when ordering

- tube diameter and length
- tube material
- electrical connection

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