Cut tubes and pipes chipless and with low burrs

The tube and pipe cutting machines RTA 35 and RTA 75 cut tubes and pipes chipless and with low burrs.

The diameters handled range from 2 to 76 mm with wall thicknesses between 0,4 and 3 mm.

The tube is cut by a round knife rotating around the tube, the tube itself does not move.

The knife is arranged between two chucks which hydraulically clamp the tube. In order to avoid an inner burr which normally results from chipless cutting, the tube isn't cut completely but hydraulically 'torn' or – for bigger diameters – 'broken'. Thereby the inner diameter remains except a very small reduction. No inner burr exists..

Opposite to the knife a roll is arranged which circulates the tube with the same speed as the knife. With this roll outer chamfers may be rolled to the tube during the cutting process. Knife and roll are antifriction beared and not driven separately. The lining of knife/roll is – with the RTA 75 – effected via motors, each having its own control which also circulate the tube. With the RTA 35 the lining is done via a hydraulic-mechanical arrangement.

Various materials can be treated, e. g. steel, high-grade steel, Al-alloys, other non-ferrous metals, etc.

The knife-lifetime depends on the materials to be cut, however, ranges between 20 and 30.000 cuts.

The energy supply as well as profibus control to the lining motors is done via collector rings.

RTA75

tube diameter: 2 to 76 mm
wall thickness: 0,4 to 3 mm
material: steel, high-grade steel, non-ferrous metals
Cycle time: up to 1700 parts/hour

RTA 35

tube diameter: 2 to 24 mm (35 mm)
wall thickness: 0,3 to 1,8 mm
material: stell, non-ferrous metals
cycletime: up to 1900 parts/hour

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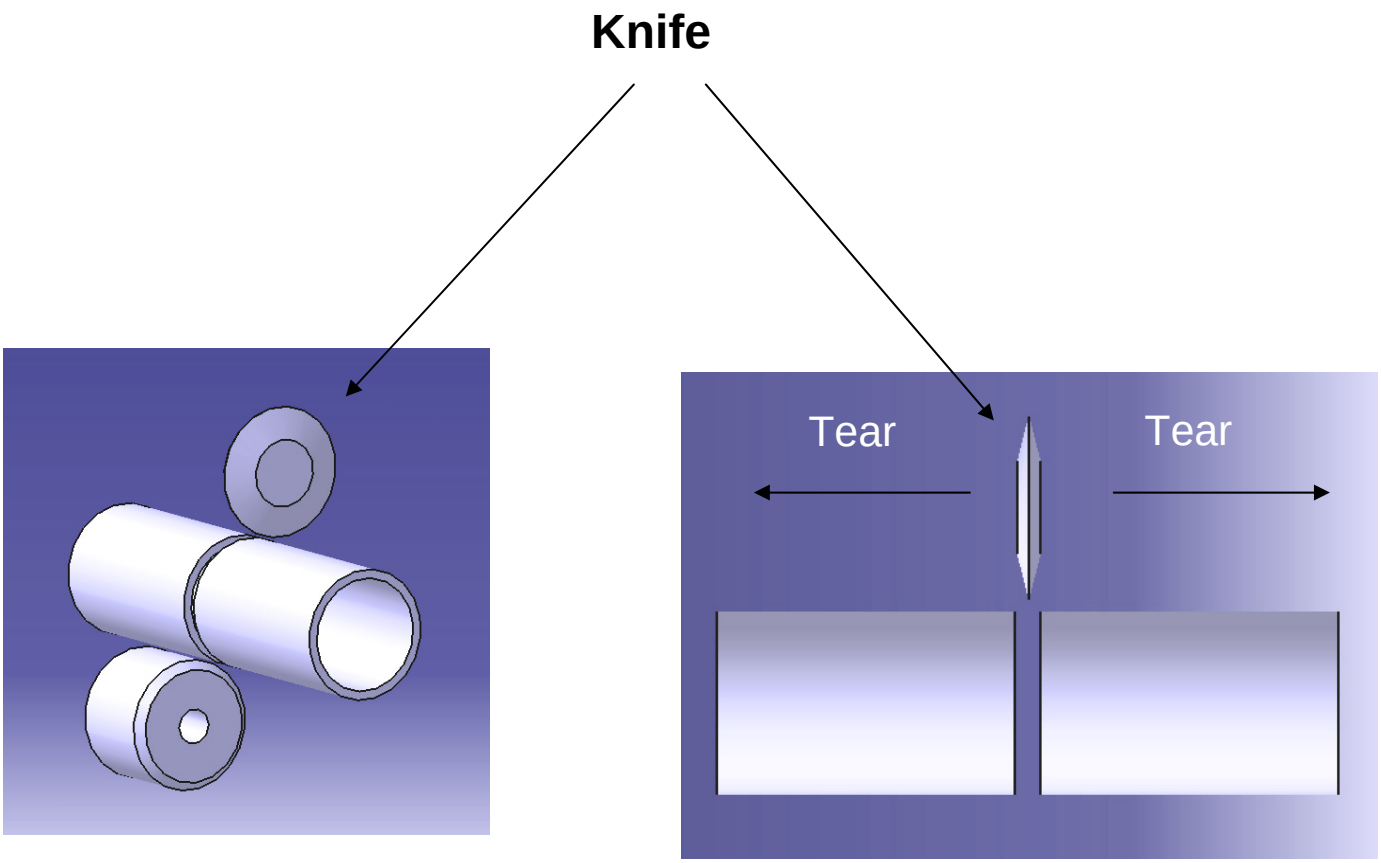
A principle sketch of our chipless cutting system:



The knife and the roll rotate.
The tube is fixed.

A minor reduction of the inner diameter of the tube/pipe is the result, however, no burr remains !

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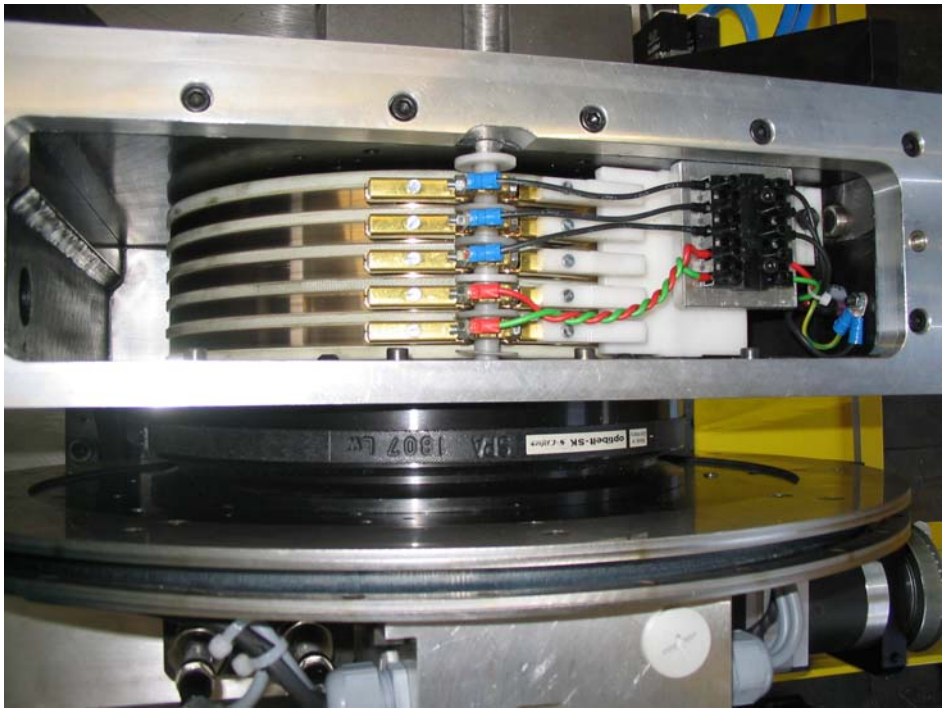
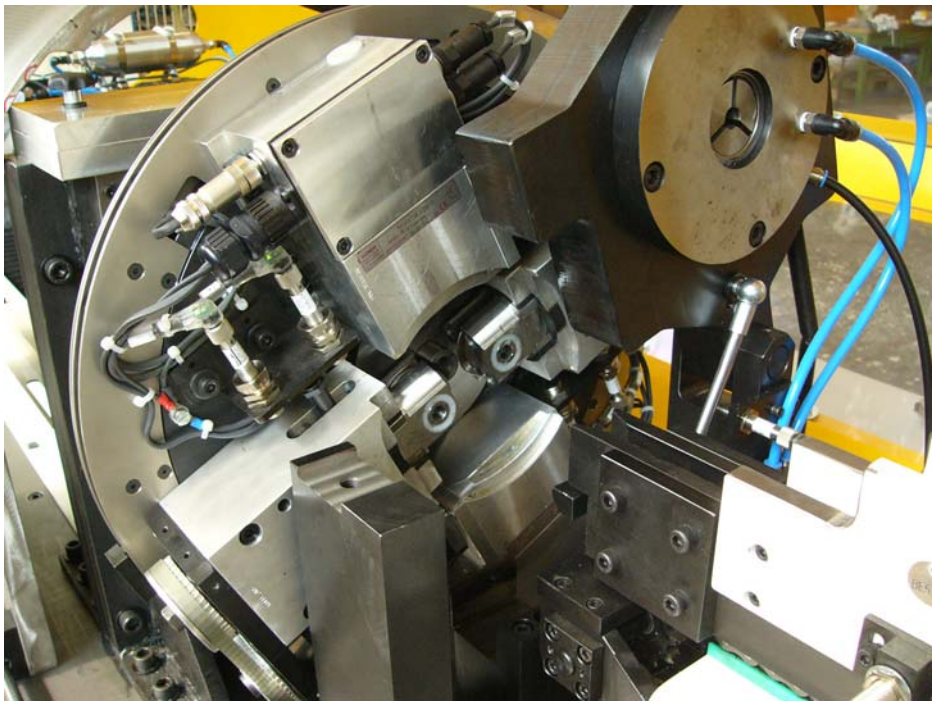


Transmission of energy and control leads via collector rings



Cutting head with knife- and roller drive for RTA 75

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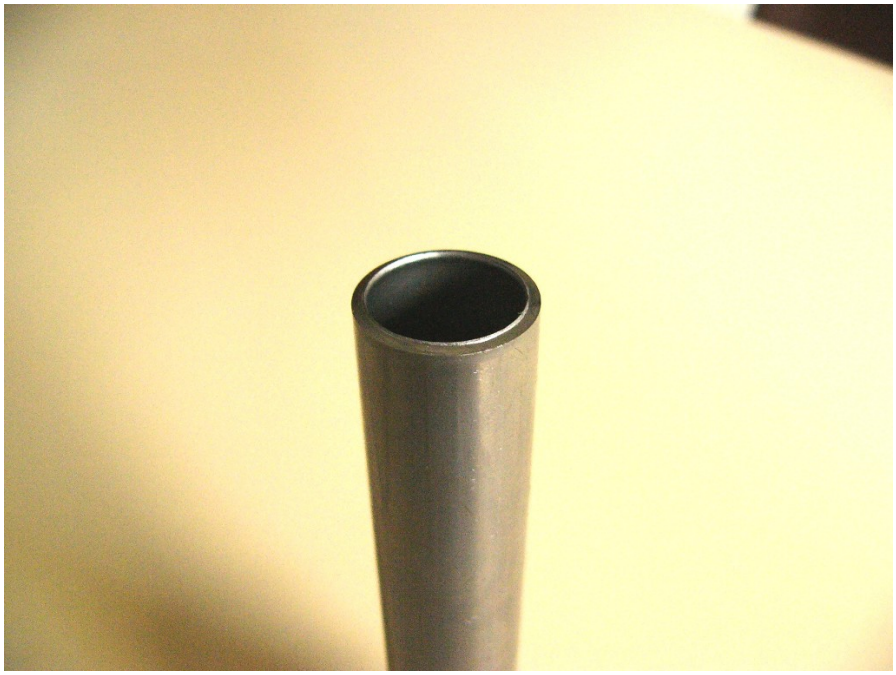
high grade steel tube, chipless cut and “torn“



Tube chipless cut, „torn“

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high grade steel tube, 56 x 1,5 mm, chipless cut, “torn” and “broken”

Chipless cut tube, „torn“

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Supply of the raw materials to the cutting machine, in most cases 6 m rods, is automatically performed either via a 'bundle loader' or an 'inclined table magazine'.

Using the bundle loader a whole tube bundle will be used placed in belt loops. The individual tube rods are separated and supplied automatically to the cutting machine.

If the tube diameters vary more often an inclined table magazine would be preferable. A defined number of tubes is placed on an inclined input-table from where the tubes automatically are separated and supplied to the cutting machine. In most cases the tubes are placed manually.

The separated tubes are taken by a clamp which is driven by a servomotor actuated (recirculating) ball screw. The clamp drives each time the tube length as input via the display. By that exact tube lengths are the result.

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RTA 75 with inclined table magazine

RTA 75 with bundle loader (tube bundele on the bottom – front)

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Magazine to supply the tube cutting machine – for 4 different starting tube lengths

Hydraulic tube, brake tubes, control tubes or similar must not have any chips especially not in the inner part.

Cutting the tubes with our cutting machines RTA 35 and RTA 75 is a chipless process.

For example hydraulic tubes Ø 6 bis 12 mm are automatically supplied via inclined table magazines to the cutting machine RTA 75 and cut.

In order to make a maximum use of the individual tubes 2 or 3 different lengths are cut out of one tube.

The cut pieces are received by a sorting unit and placed - sorted by length - into a magazine.

The first cut and also the final piece are sorted out separately. If requested, one can operate the machine without first cut - this material saving possibility is freely selectable via the operator's display.

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Cutting machine RTA 75 for hydraulic tubes

For cost reasons every new tube should be used to an optimum.

Therefore and as per production needs each tube is cut into 2 – 3 different tube parts/lengths. Sorting these lengths is done automatically.

During this the 1st tube parts of each tube length are transported to one side and the 2nd to the other side. The first cut and also the final piece are sorted out separately.

One can produce different lengths of tube parts - nearly any size is possible.

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Cutting machine RTA 35 with sorting unit of different tube lengths

Tube cutting machine with sorting unit for tube parts

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Tube cutting machine RTA 75 with 4x-bundle loader and sorting unit for long tube parts up to 5,7 m length

Tube cutting machine RTA 35 for small tube diameters = 4 – 12 mm

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When working with coils - e. g. copper soft or hard, Al-alloys, steel - an equalized speed between uncoiler and cutting machine is of great importance.

Only then a smooth working cycle can be guaranteed.

This is solved by using a specially developed equalizing roll, which actuates a driven uncoiler.

The tubes are straightened before cutting. 18 straightening rolls are available for this purpose. The rolls - which are hardened and polished - calibrate the tube from a slightly oval diameter into the nominal diameter. If requested soft copper tube material can also be hardened during straightening

The straightening apparatus consists out of two single units – each one horizontal and vertical.

Each apparatus bears 9 forming rolls whereas each 4 can be adjusted separately. Each of the adjustable forming rolls has a scale, so that it is easy to repeat the same values at any time. Exchanging the rolls for different tube diameters is done fast and easy. After flipping up of each two flaps the rolls can be drawn off without loosening any screws and the new rolls be attached.

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Coil-tube-supply with uncoiler and equalizing roll

Tube coil supply to RTA 35 with uncoiler and equalizing roll

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Uncoiler with equalizing roll

RTA 35 with tube supply from a coil

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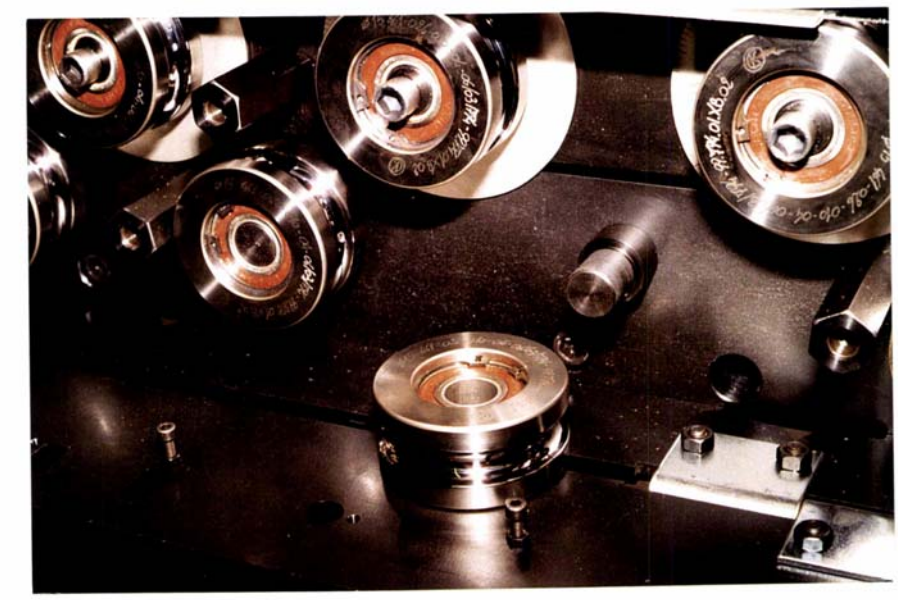
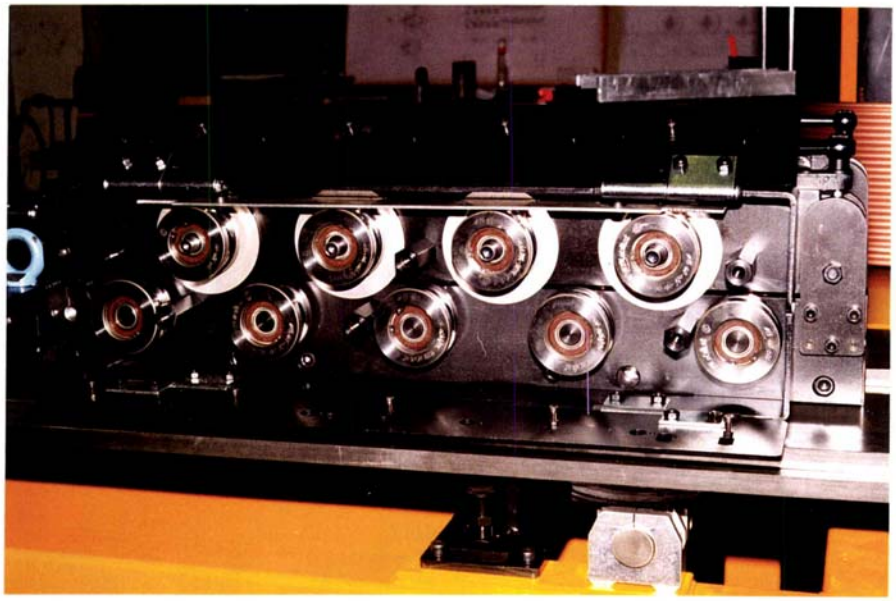


‚Clip on' straightening rolls of the straightening unit (no fixing necessary)



Straightening apparatus with 9 straightening rolls. The adjustment is done without clamping with counter nut or similar

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RTA 35

The tube parts cut by RTA 35 are – in a simple way – taken by a V-form tipping trough. The tipping trough pivots to the left or right so that the tubes roll out, via a shute, into a container.

This simple execution for supply of the tube parts has proven especially for a starting tube material supplied from a coil.

Acceptance/Taking up of cut pieces by the V-form tipping trough

After cutting the tubes with the cutting machine an immediate linking to other processing machines can be made, as e. g. closing the tube ends or punching the outside of the tube

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Cutting machine with grabbing system for chained working processes

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