wifag//polytype group

TMC 170 and 200

The production lines for impact-extruded collapsible aluminium tubes

mall//herlan

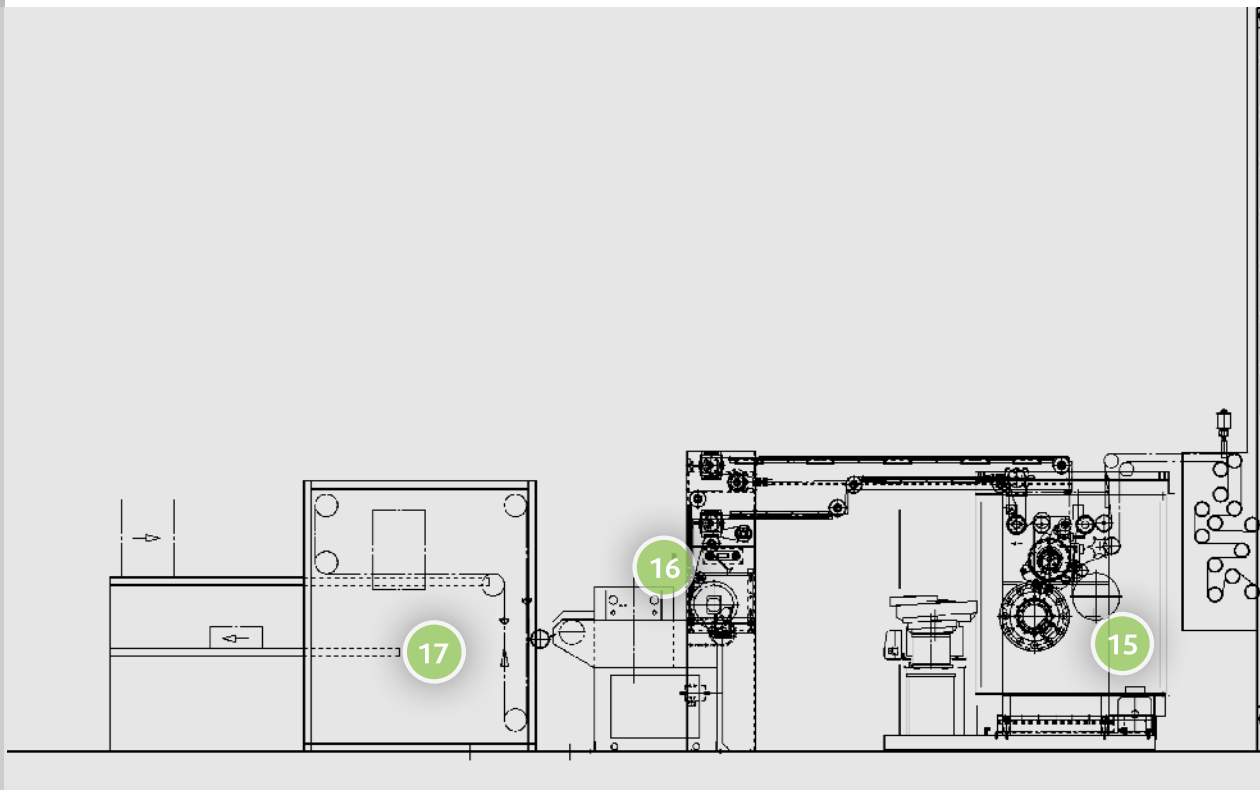
The production line for impact-extruded collapsible aluminium tubes

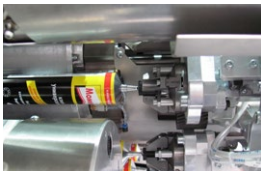
The TMC production lines from mall//herlan produce collapsible tubes made of aluminium. Aluminium slugs enter at the front, and tubes - complete with cap ready to be filled - are the finished product at the end of the line.
These lines produce in two different versions either 170 or 200 aluminium tubes per minute in a continuous process.

The TMC tube lines are mature machines with proven reliability, backed up by over 100 years of expertise and experience in the field of mechanical engineering at mall//herlan.
With an effective production speed of 170/200 cpm, lines of this kind can turn out over 50/60 million tubes a year.

// **Dozens of installations on all continents –** proven and reliable technology
// **Turn-key line machines with unique design –** to fit all plant layouts
// **Strong and stable extrusion process performed by the press during each stroke movement –** production reliability guaranteed
// **Precision cutting and shoulder brush in the trimming and brushing machine –** top-quality tube output
// **Reliable transfer systems -** smooth operation and high production output
// **Energy-saving features of the decoration process/ drying oven –** cost-effective
// **High-quality premium decoration printing unit with up to 8 colours –** widest possible decor variety
// **Reliable and continuous cap/nipple application on the capping machine –** broadest possible variety of closures

The production line TMC for impact-extruded collapsible aluminium tubes





17 Packing machine

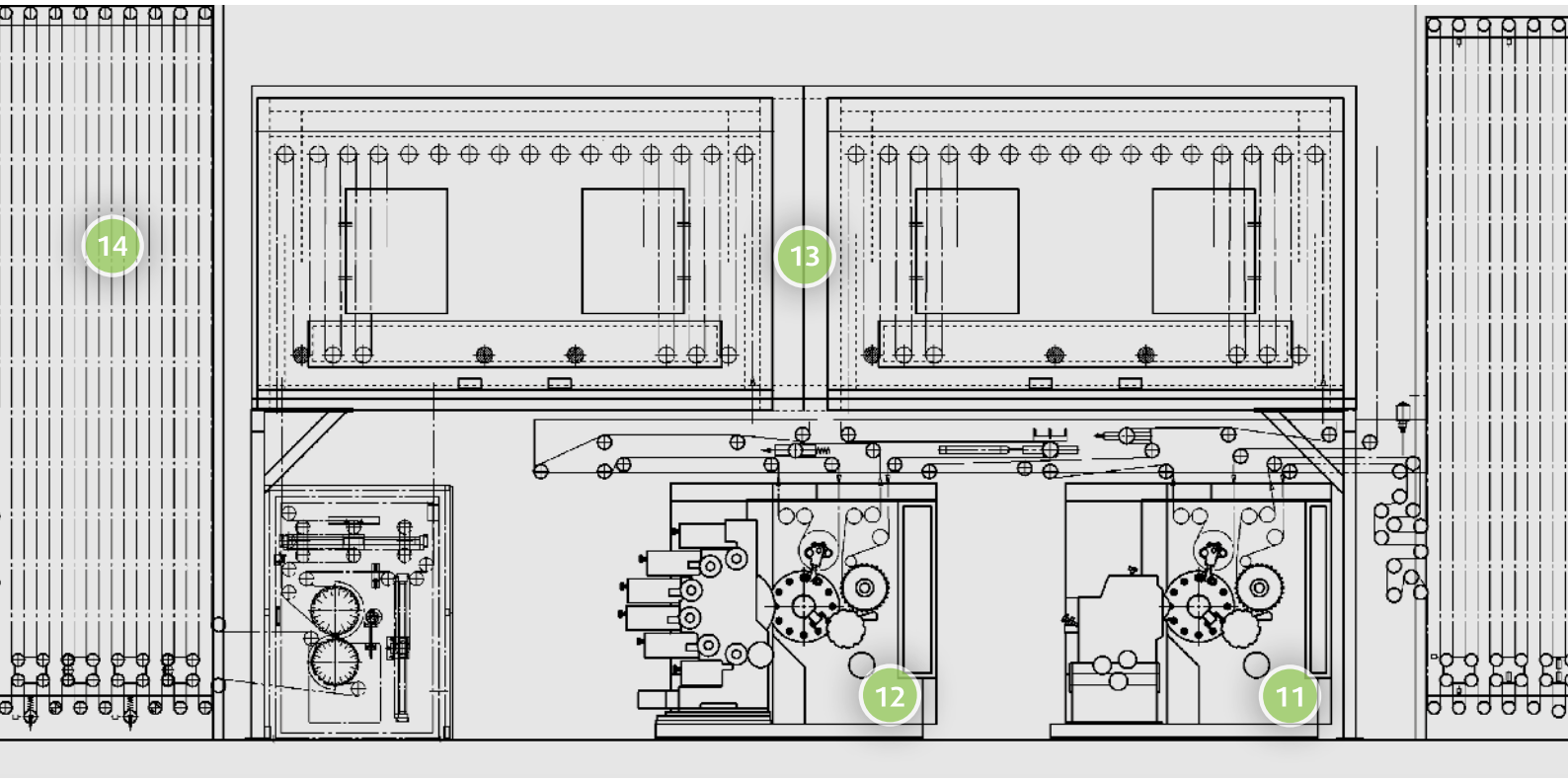
The tubes are packed in boxes.

16 Latexing machine

The inside end of the tube is covered with a non-flammable compound, such as latex incl. ejection of tubes with missing latex.

4. Nipple application device
5. Sealing station
6. Check of the correct cap position by adjustable laser detection, ejection of tubes with missing or badly screwed-on caps.

2. Two screw-on stations working in tandem. The closure rotates while the tube is immobile.
   The number of screw-on revolutions is user-selectable.
3. Tightening station with servo drive for the tightening head (stationary mandrel) for tightening of the caps



15 Capping machine

For automatic screw-on of the tube caps

1. Closure screw-on using the pick-and-place method: precision feed of the caps via vibrating conveyor and feed channel with patented separation technology

14 Accumulator

The accumulator guarantees non-stop production by synchronising the machine speeds of connected machines.

13 Drying oven

Coating and inks are cured in drying ovens to ensure a perfect optical appearance.

12 Printing machine

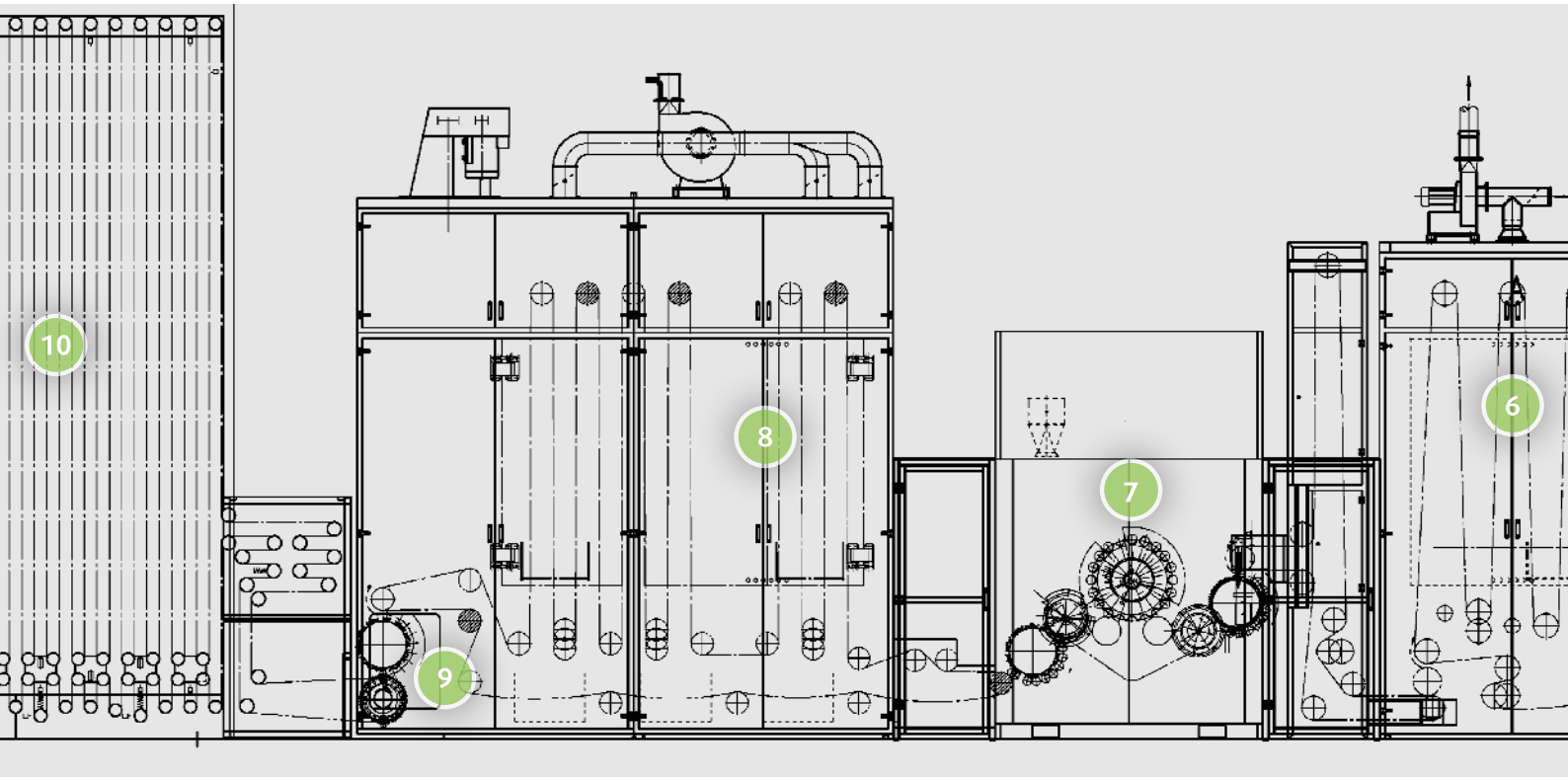
The second machine of the deco area is the printing machine, which can apply up to 8 colours, ensuring the widest possible decoration variety for collapsible tubes made of aluminium. The decorator is also equipped with a quality assurance system for a perfect and stable print finish.

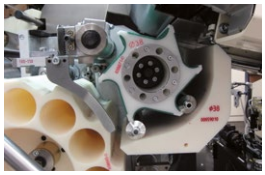
11 Basecoat lacquering

The first machine of the deco area is the base coater. This is where the tubes receive the base coat, which is important for stain resistance and print quality.

Operation:

Aluminium slugs enter at the front of the machine, and tubes ready to be filled emerge from the other end of the line - in a single continuous process. The line consists of three modules: the frontend produces the tubes, the deco area applies the protective coating and the label, and the backend is where the caps are screwed onto the tubes, followed by quality checks and final packaging.





9 Transfer drum

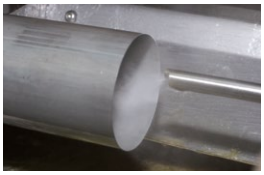
Highly efficient vacuum system ensures maximum transport reliability.

10 Accumulator

The accumulator guarantees non-stop production by synchronising the machine speeds and emptying a machine if it stops.

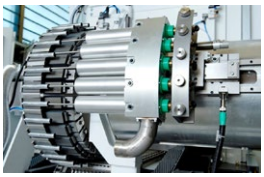
8 Internal coat dryer

The internal coat dryer creates the temperatures required by the lacquer manufacturers for polymerizing the internal lacquer coat and therefore guarantees product safety.



7 Internal coating machine

The internal coating machine apply lacquer to the inside of the tube. Spray lances are dipped into the tubes and, as the lances are pulled out, the tubes are sprayed with internal coating up to three times.

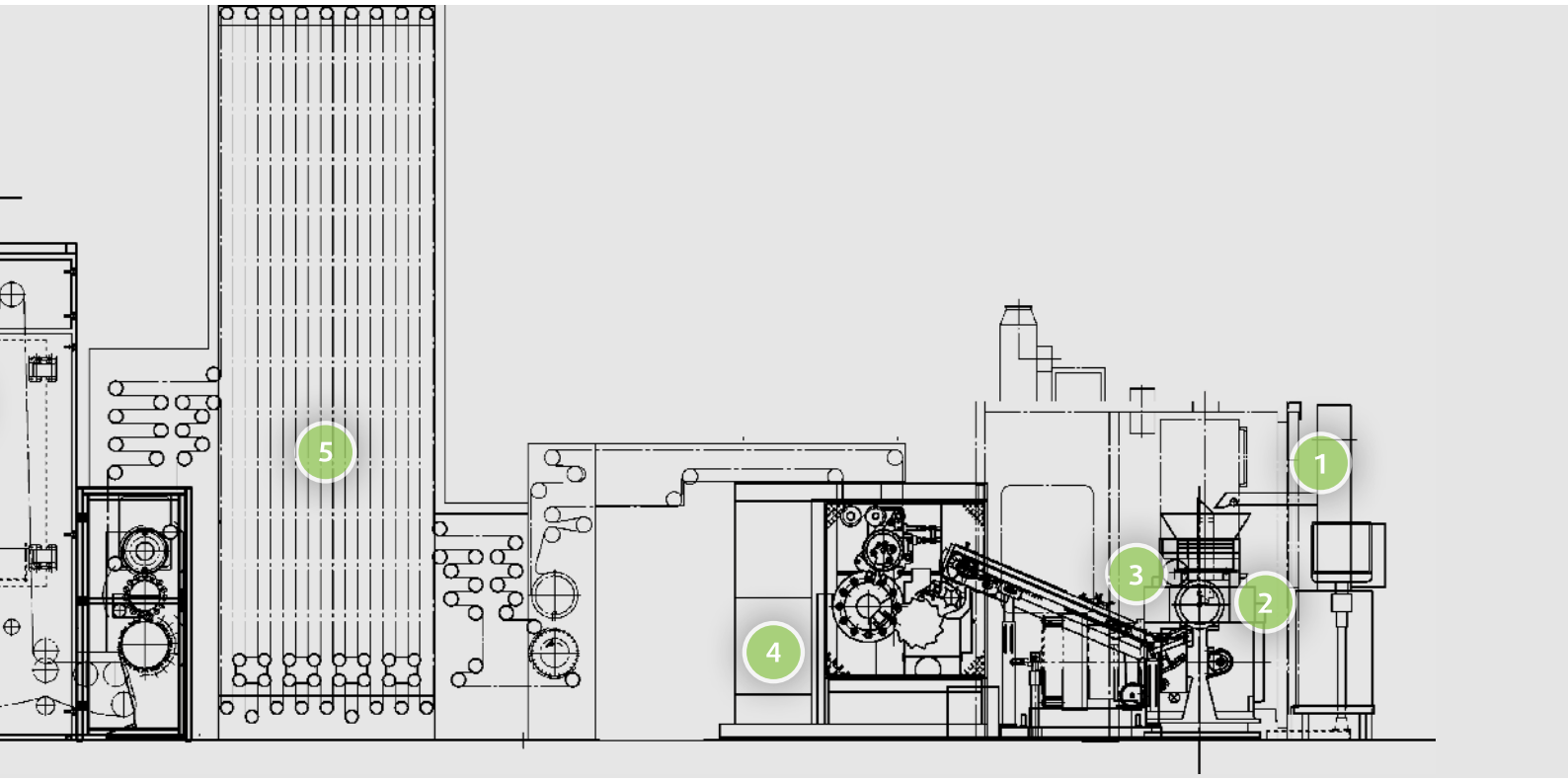


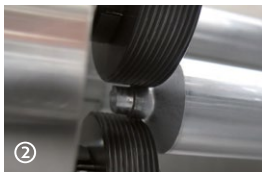
6 Annealing oven

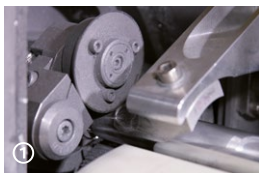
The tubes are soft-annealed at a temperature of 500° C. This gives the tube its typical (collapsible) deformability. The annealing time is approx. 2-3 minutes for each tube.

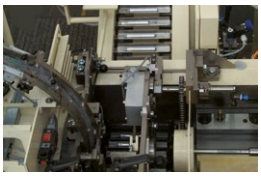
5 Accumulator

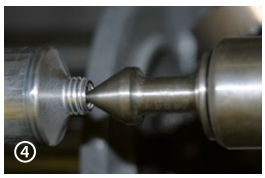
The accumulator guarantees non-stop production by synchronising the machine speeds of connected machines.
In the accumulator the tubes are collected without gaps.











4. Device for deburring the tube orifice
5. Brushing of the shoulder

4 Trimming machine

There are five tube head machining steps:

1. The tubes are shortened to the specified length.
2. Radial thread rolling unit with indexed thread rollers
3. Turning station for finishing the tube neck.

2 Extrusion press

The extrusion press turns the slugs into tubes by pressing a punch into the blank with a force of up to 80 –160 tons. The aluminium becomes plastic and flows back along the wall of the punch.

3 Quality check

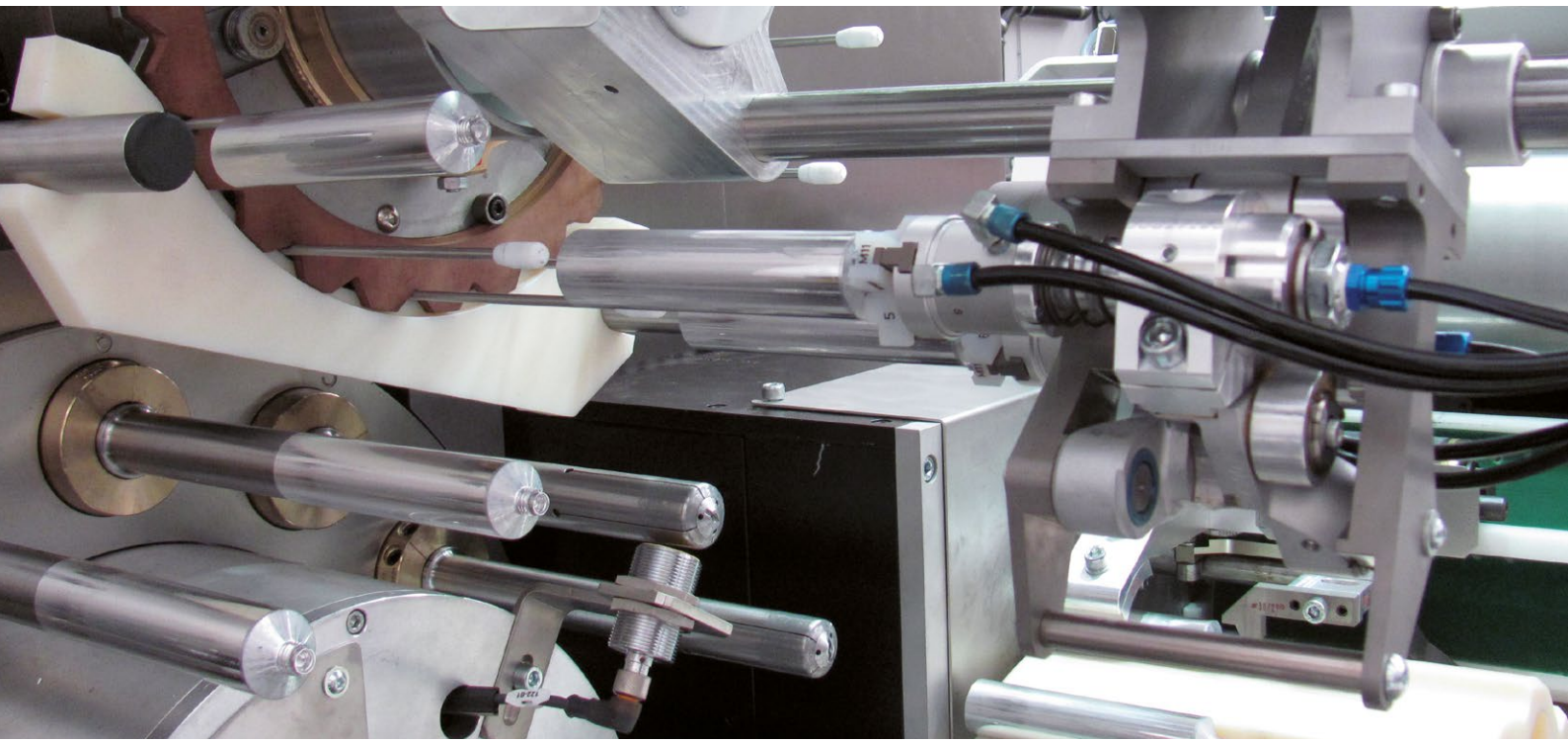
Recognises and rejects tubes that are too short.

1 Material infeed

The raw material is a slug made of aluminium. The slugs are reliably forwarded in the material infeed via an adjustable active conveyor system and a patented chute system. The slugs are filled into the conveyor, where they are separated and aligned for further processing.

Technical data

TMC 170 and 200 production lines



Tube data	TMC 170	TMC 200
Tube diameter mm	13.5 – 45	13.5 – 45
Max. tube extruded length mm	250	250
Finished tube body length mm	210	210
Max. production speed tpm	170	200

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