DERICHS

# Laminatingrolls

## Copper-Design

# Cast-Film Extrusion


Cast films made on chill rolls have now become an essential part of modern life. Derichs is well known throughout the world as a supplier of heating and cooling rolls to this growing market sector. Our rolls are specified by both original equipment manufacturers and processing companies.

The challenge of ever increasing demands on machines and equipment to produce higher line speeds, better quality and greater cooling capacity can now be met with a new generation of cooling rolls:

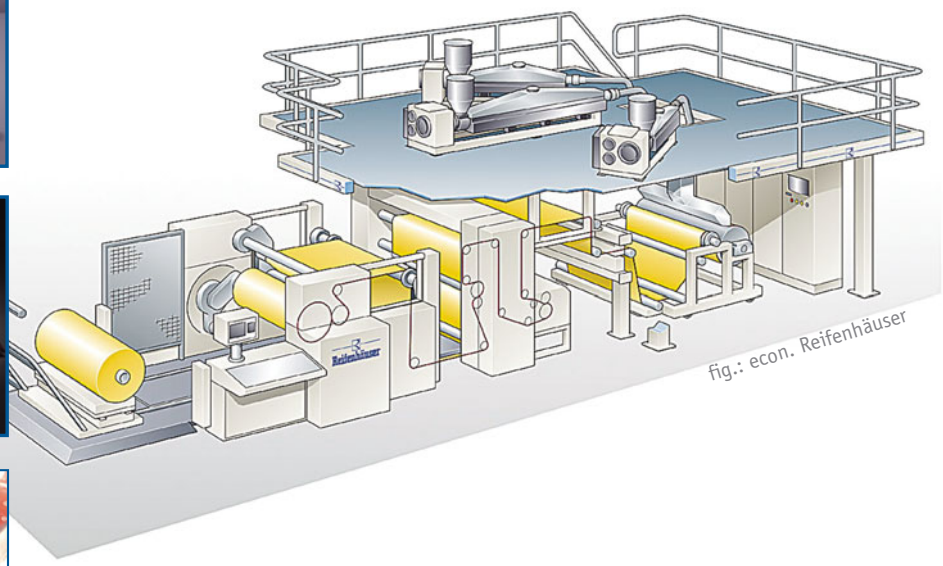


fig.: econ. Reifenhäuser

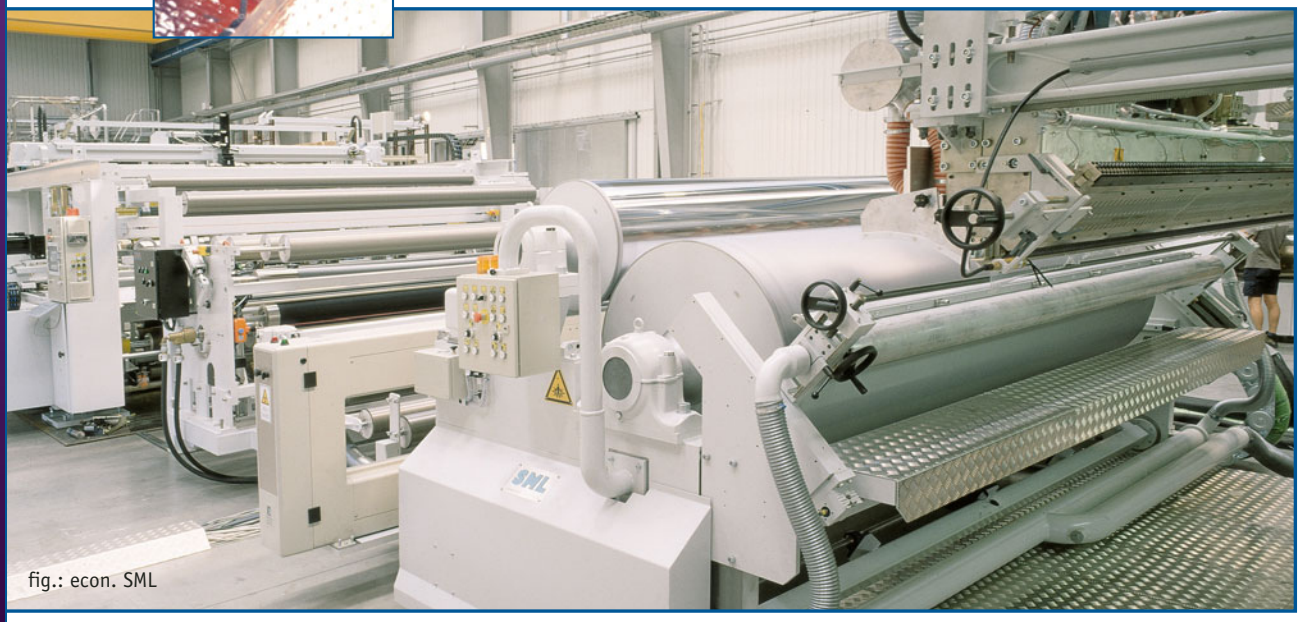



fig.: econ. SML

# Copper Shells. The innovation for discerning high-tech customers.

Based on decades of experience in designing and manufacturing double shelled cooling rolls, we have in co-operation with Bury Electroplating Co. Ltd. (UK) developed a completely new design concept.

Bury Electroplating have the capability to manufacture seamless high quality copper tubes. These tubes are then assembled by Derichs onto a high stiffness inner body with a shrink fit. We thus achieve the best stiffness as well as the optimum heat transfer. The design of the inner body incorporates special sealing and centring units and may be constructed using a variety of different materials.

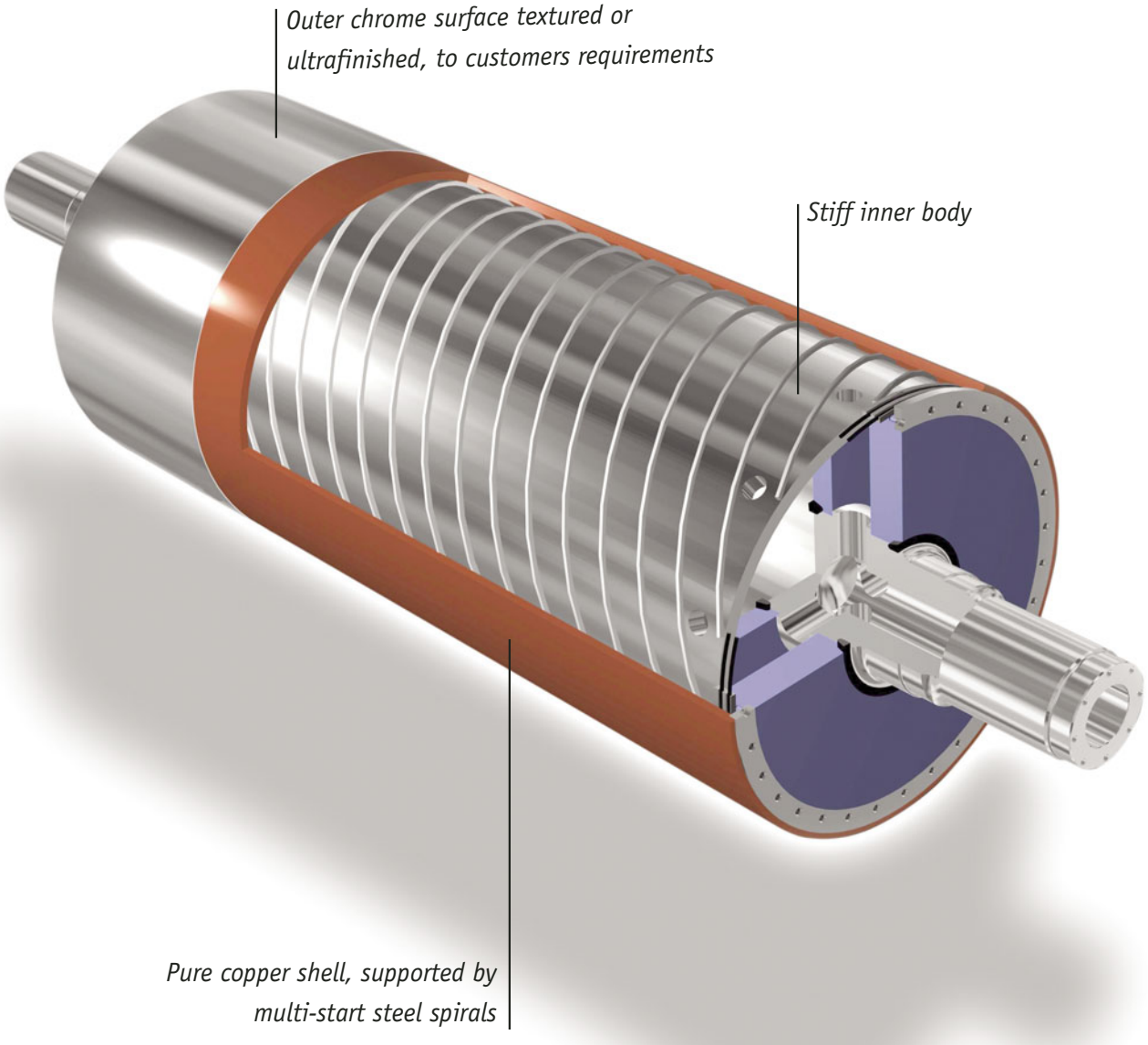
When an outer shell of copper is employed in the construction of laminating rolls, its high thermal conductivity ensures a dramatic improvement in performance when compared with steel or even aluminium shells.

An added benefit is that it is possible to operate with the cooling water at substantially higher temperatures without any adverse effect on the cooling capacity of the roll.
Quite the reverse:
Despite higher water inlet temperatures significantly better product cooling is achieved than with a standard roll. Also the higher temperature of roll surface outside the web width greatly reduces or even eliminates the "icy end" phenomenon which causes the formation of undesirable condensation on the ends of the roll face. The production disruptions associated with condensation water become a thing of the past.

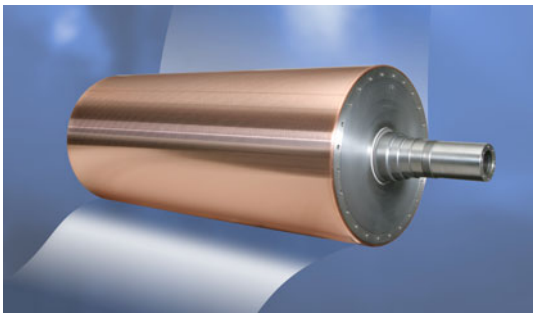
Besides higher productivity and improved quality we can complete a virtuous circle with substantially lower energy costs. The temperature of the cooling water can be increased from the 8 - 10°C as required on a standard roll to room temperature (20°C) when using a copper shell.

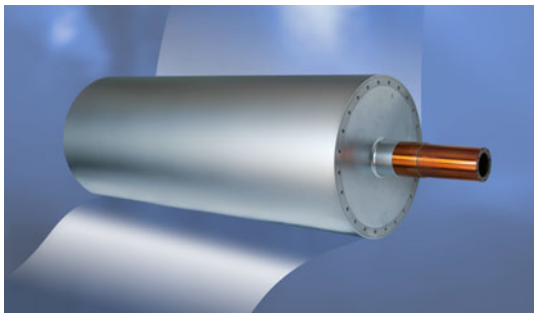
# The advantages at a glance

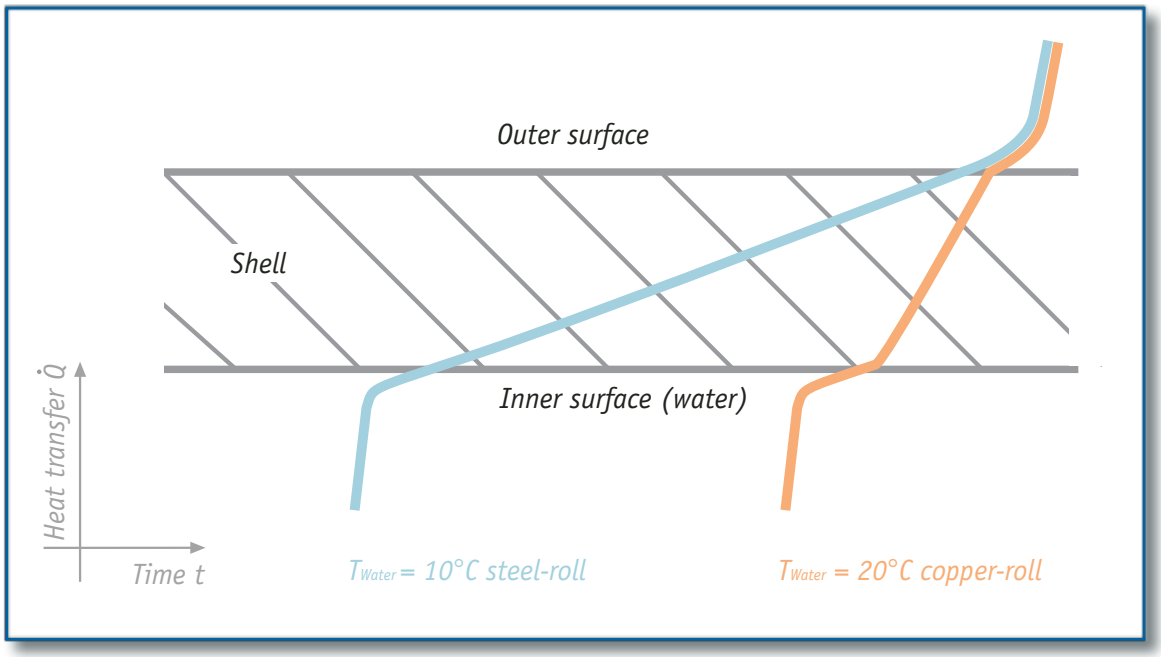
- Stiff inner body for reduced deformation
- Saving of energy costs as a powerful water chilling unit is no longer required
- No condensation because of higher cooling water temperature
- Increased production speed at the same roll diameter
- Minimising the roll diameter for new projects
- Optimum shell quality (pore free) using highest quality copper
- Absence of welded seams simplifies chrome plating and subsequent refurbishment



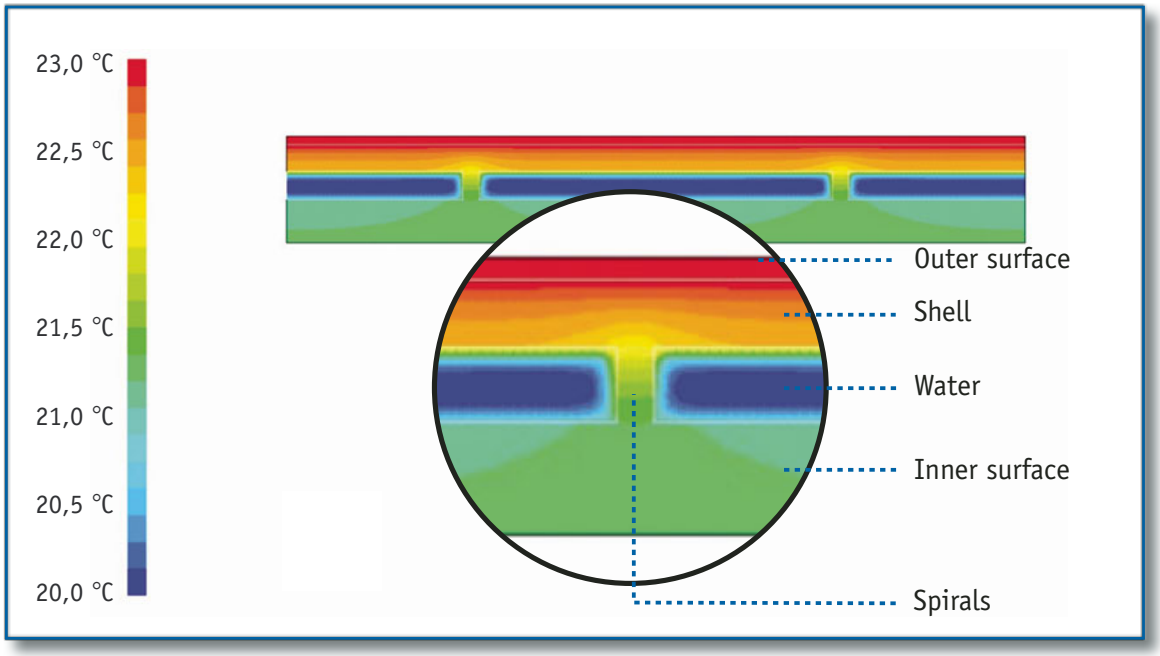
# Technical specifications







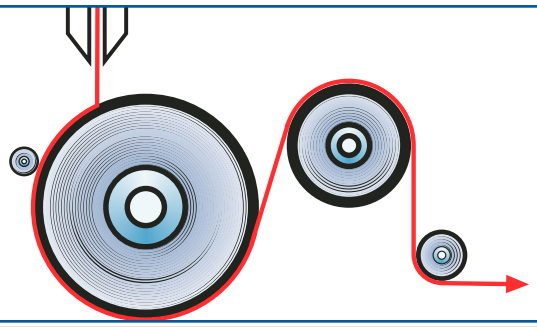

*Comparison of thermal conduction of copper and steel*



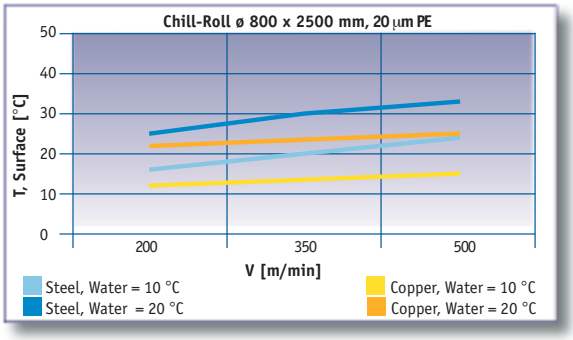

*Temperature distribution within copper shell*

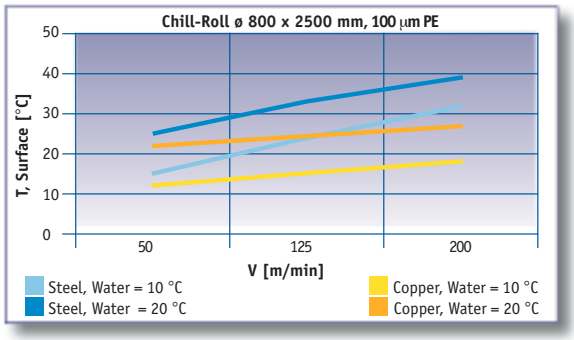
# Example Calculation Copper – Steel

| | |
|---|---|
| Roll | 12mm steel resp. |
| | 12 mm copper shell |
| Water | 10 °C resp. 20 °C |
| PE | 240 °C |



*Roll surface temperature of different types and applications*

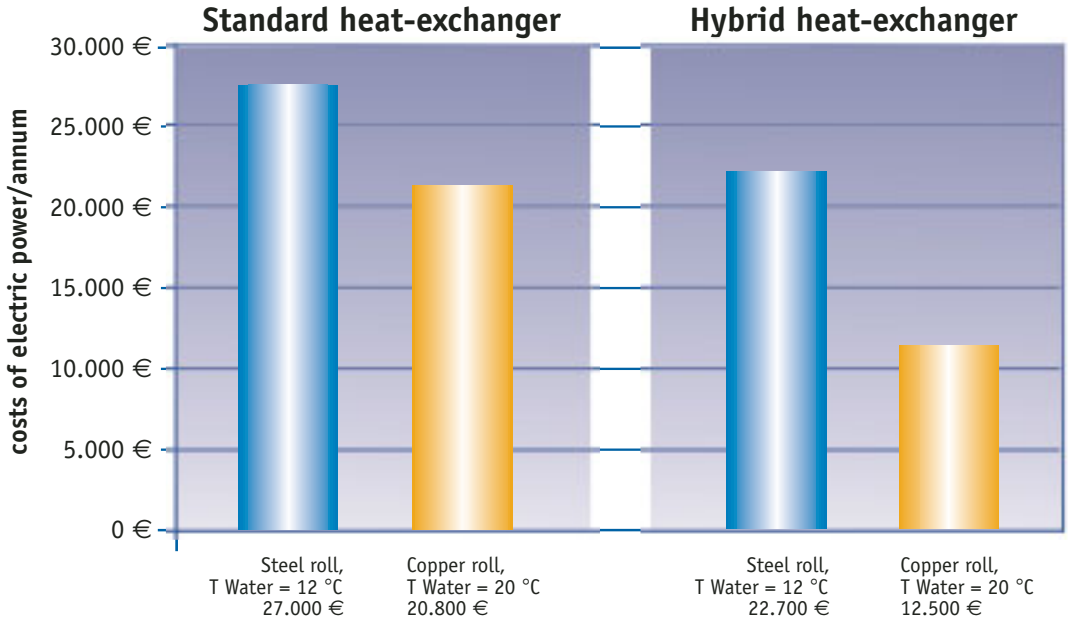



Comparison of operating costs; Steel vs. Copper (costs of electric power / annum)

Project study company GWK

**Installed cooling capacity of heat exchanger: 240 kW**
**Is equivalent to: resp. 1.500 kg/h PP**
**Supposition costs of electric power: 0,05 €/kWh; 8.000 h/a**




**Saving by use of copper rolls:**
**6.200 €/annum**

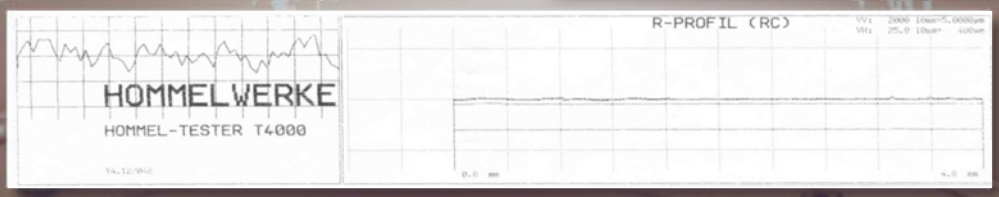
**Saving by use of copper rolls:**
**10.200 €/annum**

# Surfaces

Derichs and Bury Electroplating each have more than 30 years experience in servicing the plastics industry. Our combined resources offer a great treasure of knowledge and experience for our customers to plunder.
Should you require the replication of an existing surface, or the development of a completely new one for a special task we have both the means and the technical skills to meet your demands.

The photomicrographs below (taken on our special computerised microscope system) are but a small example of the many textured surfaces we can achieve in addition to standard high - gloss superfinish such as

- D.M.E. 3-100
- Mirror-Pocket
- Glossy-Low-Friction
- Non-Set-Off; etc.



First adress for precision

and reliability.

**Präzisions-, Heiz- und Kühlwalzen**
**für die Kunststoffindustrie**

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