Trias® – the new generation three-roll mill.

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Trias® – the new generation three-roll mill.
More efficient, more flexible and safer.

Trias® [1] setting new standards
Buhler three-roll mills are considered preferred technology in the production of printing inks and pasty products for a wide range of applications in the electronics and high-tech industries. Trias® represents Buhler's continuous commitment to further develop long-term established technology.

Reliability, high raw material yield and gentle dispersion of temperature-sensitive products are keyproperties of Buhler three-roll mills. Buhler three-roll mills also show superiority over other technologies with regards to gloss properties of printing inks. Buhler solutions facilitate contamination-free processing of sensitive products. Different roll materials and concepts permit clean room production according to international standards.

Independent of the roll pressure, the camberless VIVA® roll technology guarantees even product quality along the entire roll length. In respect of operating reliability, the wide range of applications and resulting advantages for the production of pasty products, nothing has changed.

The numerous optimisations allow Buhler to introduce Trias®: A three-roll mill generation setting new standards in productivity, flexibility, user-friendliness and safety.

Trias® – the advantages
- Maximum throughput at very high roll speed and outstanding cooling capacity
- Very wide roller pressure range from approx. 0 N/mm to over 80 N/mm
- Products previously produced in gap operation can be processed in low roller pressure range (5 to 10 N/mm)
- Accurate and repeatable roller pressure and gap control
- Electronically controlled operating parameters
- Optional film thickness control on the third roller
- Suitable for the operation in clean rooms according to US Federal Standard 209E – clean room class 1000
- Oil and contamination free operation, optionally with selected ceramic materials
- High operator safety level according to the latest safety regulations
- Easy cleaning through newly designed roller compartment

Application examples.

Printing Inks
- Sheet fed inks
- Web offset inks
- Screen inks
- Packaging inks
- Security inks for bank notes

Solar Technology
- Silver pastes
- Aluminium pastes
- Titanium dioxide pastes
- Glass solder pastes

Electronic Industry
- Glass pastes for displays and plasma screens
- Phosphor pastes
- Metal pastes (Ni, Cu, Pt)
- PCB (Printed Circuit Boards)

Other Applications
- Cosmetic products/Soaps
- Carbon nano tubes
- Lubricants (grease, oil)
- Sealing pastes
- Artist colours

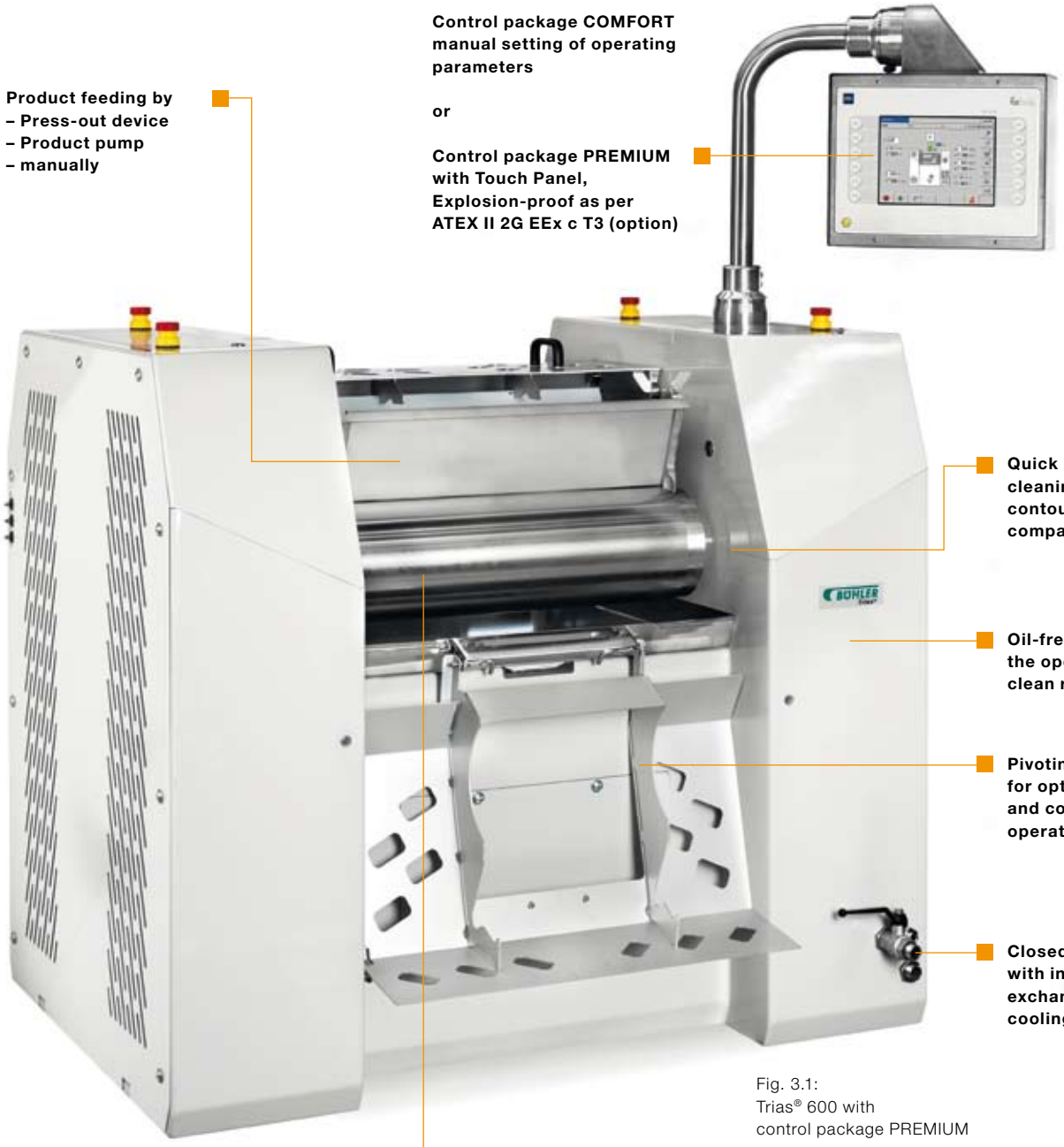
Advanced technology from Buhler.
Highlights at a glance.

Control package COMFORT manual setting of operating parameters

or

Control package PREMIUM with Touch Panel, Explosion-proof as per ATEX II 2G EEx c T3 (option)

Product feeding by
– Press-out device
– Product pump
– manually



Quick and efficient cleaning due to simple contours in the roller compartment

Oil-free equipment for the operation in the clean room

Pivoting safety cover for optimal access and comprehensive operator safety

Closed cooling circuit with integrated heat exchanger and cooling water pump

Fig. 3.1:
Trias® 600 with
control package PREMIUM

VIVA® roller technology – operation independent of roller pressure: one roll covers the entire roll pressure range. Roller materials: Buhler centrifugally cast and selected ceramics

New technology for higher performance.
Improved flexibility, repeatable quality.

Fig. 4.1: PREMIUM control package with graphic touch screen panel

Fig. 4.2: Easy access and high standards regarding operator safety are key elements of Trias® three-roll mills

Increased throughput and improved cooling capacity
The improved cooling concept with resulting enhanced heat transfer allows for substantially higher roller speeds thereby achieving considerably higher throughput rates. A closed cooling circuit with integrated heat exchanger guarantees optimised product cooling even at the highest roller speeds. This enables large batch production of temperature sensitive products.

The narrow particle size distribution, typical for three-roll mills, and the high shear rates allow unique product properties. There is no deformation of size or geometry of the primary particles which can be essential for the de-aggregating and de-agglomerating process steps.

In respect of product viscosity, Trias® offers an extremely wide operating range. Buhler three-roll mills permit production processes which are not feasible with other technologies such as high pressure homogenisers, bead mills or rotor/stator systems.

Enhanced pressure range
The precise and powerful roller pressure unit generates linear loads from 0 to over 80 N/mm. Compared to conventional three-roll mills this range is significant wider for both low and high roller pressure. Products, previously produced in gap operation can be processed in low roller pressure range (5 to 10 N/mm). This guarantees repeatable and defined production conditions. On the other hand higher roller pressures result in more efficient dispersing of tough products.

Control packages COMFORT and PREMIUM
To date, Buhler three-roll mills are generally manually controlled, which is still possible with the control package COMFORT. The new control package PREMIUM is equipped with a PLC control and a modern graphic display touch panel.

The PREMIUM package displays all operating parameters and allows process visualisation and thereby enabling automatic control of roller temperature, speed, pressure and gap.

The Buhler data logging software WinTrend is available as an option allowing continuous process monitoring and supports higher level quality management systems.

The optional film-thickness-control on the third roll enables the integrated control of product quality. Roller pressure or gap are electronically controlled and allow precise production monitoring and repeatable processes.

New concepts for more productivity.
Easy cleaning and quick roller exchange.

Fig. 5.1: Easy access to the roller compartment for easy cleaning

Fig. 5.2: The latest safety regulations for operators are fulfilled

Fig. 5.3: The complete roller package can be exchanged simple and quick

The newly designed roller compartment allows for easy cleaning. The losses during product changes or due to errors are minimal as the process unit only holds a very small amount of product.

The safety concept of the three-roll mill for the product feeding, either by press-out device or product pump, increases operator safety. The pivoted safety cover and pneumatically operated safety-basket are optimised for manual product feeding and secure full access to the roller compartment.

The new asymmetrical roll alignment and the elevated apron are designed ergonomically. The Trias® roller pressure is mechatronically operated. By omitting the hydraulic elements, oil contamination of the product is now impossible.

Quick roller exchange
Wear is limited to the apron and the rolls, which can be reground easily. Trias® rollers are quickly exchanged: The complete roller package is removed by releasing only a few elements and replaced with a new roller package.

VIVA® – unrivalled roller system.

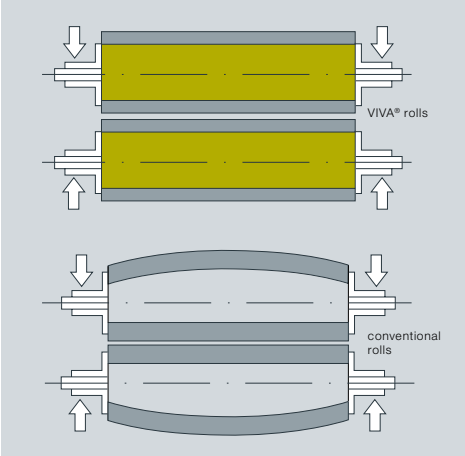


Fig. 5.4: Camberless VIVA® rolls have remarkable advantages when variable roller pressure is required

VIVA® camberless three-roll mills operate reliably – even if requirements differ and with variable roller pressures. In contrast to conventional rolls, the Buhler VIVA® roller technology is designed to be operated at different roller pressures and accordingly cover the whole pressure range.

VIVA® camberless roller technology guarantees equal product quality along the entire roll length – independent of the roller pressure. As a result, comprehensive and easily repeatable product qualities are achieved and in so doing boost productivity.

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