

## The two-roll plasticizer (TRP): Novel technology for use in rubber processing

The two-roll plasticizer (TRP) is new processing technology for the rubber industry. The automatic and continuous process combines proven methods in rubber processing, such as cracking, homogenizing and discharging. The basic principle is based on an open roll system combined with the roll-ex gear pump technology.

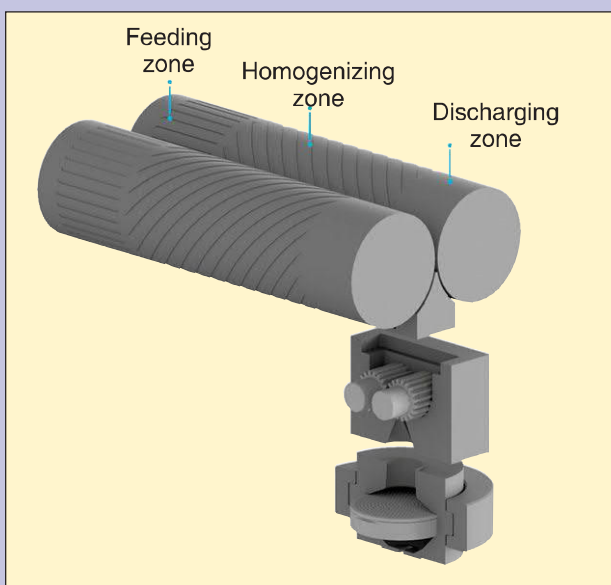
The compact system comprises three zones along the roll length (figure 1). In the feeding zone, materials of various types and shapes, such as slabs, sheets or shaped profiles, can be fed in by a conveyor. Procedurally, a mechanical forced transformation takes place in the nip of the homogenization zone, in which the material is plasticized and homogenized (figure 2).

According to the well known roll-ex TRF principle, the material then gets directly extruded in the discharging zone. The manual intervention of an operator in the process area is therefore no longer required, and is additionally prevented by a complete housing of the processing area. The result is a safe, controlled and continuous homogenization process with repro-

ducible results. Due to the modular concept, the TRP offers the option of an integrated gear pump extruder (figure 3) for gentle fine mesh straining of the material.

The basis for a gentle rework process is a controlled temperature development (figure 4). In TRP process technology, this is guaranteed by temperature zones that can be set differently over the entire length of the roll. The good homogenization and plastification performance is achieved through mechanical forging. The required friction, which increases the plasticizing performance, can be optimized for the respective process by means of different roller speeds and gap adjustments.

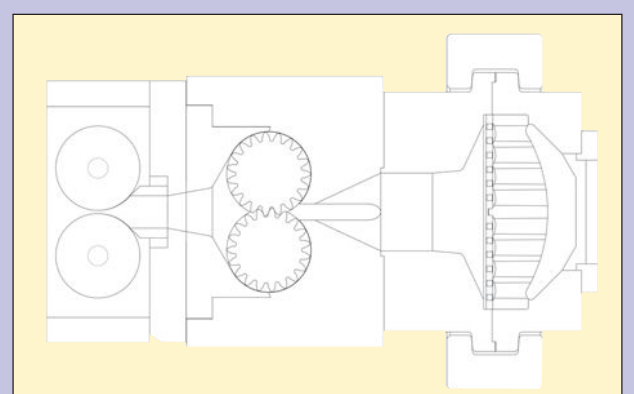
**Figure 1 - basic principle of TRP technology**



**Figure 2 - homogenization of the compound on the nip of the open mill**



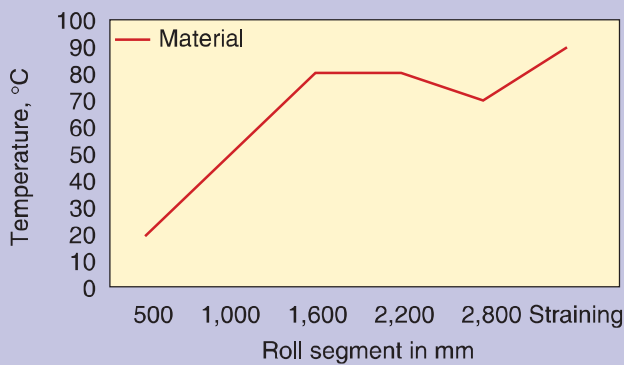
**Figure 3 - gear pump extruder with two-roll feeder**



Manuel Bessler is the general sales and project manager for UTH GmbH, and is an expert in the field of TRP (two-roll plasticizer) technology. Bessler will present, "Innovative technology for reworking material in tire production," at the Rubber Division, ACS, International Elastomer Conference next month.

# Tech Service

**Figure 4 - temperature profile along the rolls**



A roll design that is tailor-made for the rework process also enables axial material transport from the feeding zone to the discharge zone.

The TRP technology has established itself in the tire industry as an alternative solution for the processing of rework materials. In tire production, compound waste (unvulcanized material) is unavoidable due to the process. These materials should be reworked with regard to sustainability and the economical handling of valuable resources; not least of all because of the high raw material costs. The resource-saving TRP Reworker 2800 (figure 5) has a throughput of 2,500 kg/hour, and thus it covers the usual requirements for reworking in tire production.

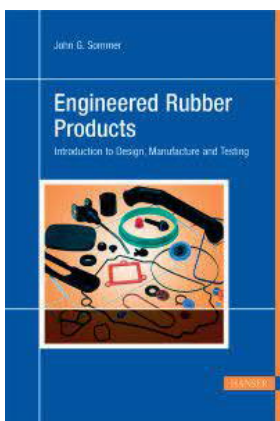
**Figure 5 - TRP Reworker 2800 with integrated gear pump**



Facts presented at a glance include:

- Up to 50% energy savings compared to existing technical processes
- At least 5% of raw materials can be saved in tire production by employing the TRP process
- 98% of the process related waste can be returned to the tire manufacturing process

Other sizes and designs offer options for other processing tasks in rubber and silicone processing, such as preheating, mixing and discharging.



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