

THE ROLL COVERING PROCESS



The roll covering process consists out of 6 steps : the preparation of the metal core, the preparation of the rubber, applying the rubber, vulcanisation, finishing and then the final inspection.

The steps described below follow our quality manual, in accordance with our ISO 9001 certificate.

We will send you a copy upon request.

All rolls and cylinders are **checked before covering**.

The **grit-blasting and adhesive layer** ensure that the covering adheres to the roll. This 2 phases are highly technical.



1. PREPARATION OF THE METAL CORES

When receiving a roll for covering it can either be a new one or a used one. A thorough control upon receipt is crucial. During this phase we analyse the roll, verify if it matches your order and immediately check if the roll is still suited for its function.

In order to guarantee a perfect adhesion of the new covering, we need to start with a clear surface, free from any sort of chemical pollution and properly prepared.

Following steps are followed:

- 1. Determination of the construction material of the roll :** we can cover rolls out of steel, stainless steel, cast iron, aluminium, copper and various composite materials. The nature of the material determines the type of surface preparation which follows, the binding system, and in certain cases also the temperature and vulcanisation method.
- 2. Removing the covering :** This operation is generally performed on a lathe. The old covering is removed in such a way that the core diameter is not reduced.
- 3. The degreasing methods.** New rolls are systematically degreased to make sure the table is without traces of oil. Already covered rolls are not greasy because their table surface is protected by the covering. In cases of doubt, or when a roll is greasy or oily upon receipt, it will also be degreased. There are 2 degreasing methods: with solvents or by means of steam in the autoclave.
- 4. Grit-blasting or sanding of the surface,** to obtain a suited structure for adherence.
- 5. The application of adhesive or primer** (binding layers) by means of a paint roll or by spraying. middels verkwast of verstuiving. The choice of adhesive is as important as choosing the elastomer itself.



Extruding of rubber

2. THE PREPARATION OF THE ELASTOMER

The formula of the rubber- or polyurethane compound that needs to be applied is based upon end use. Certain rubber compounds can contain 15 carefully weighed ingredients, from following material classes :

- base polymer or polymer compounds;
- reinforcing fillers;
- non-reinforcing fillers;
- plasticizers;
- additives;
- reactive and regulatory substances for vulcanization;
- protective substances and antioxidants;
- color pigments;
- etc.

For rubber compounds, the ingredients are added into an open or closed mixer in a specific order until a homogeneous compound is obtained. The compound is then cut into sheets and tested. After the compound is approved it is transformed for application and covering :

- or in a calendered sheet, a thin sheet of equal thickness of which the layers are separated by a plastic foil and which is wrapped around a mandrel (cold process) ;
- or in strips, which are wrapped around the roll body later via an extruder (hot process).

In case of polyurethane, the preparation phase is almost identical. Polyurethane is however processed as a viscous liquid. The application to the roll body is therefore very different.



Each compound is checked before application

3. APPLYING THE ELASTOMER

For rubber compounds, Hannecard uses 2 covering procedures :

- Wrapping of the roll body with calendered rubber sheets to the desired thickness, at the same time as much air as possible is removed
- Wrapping with hot rubber strips, via a special extruder

After applying the rubber, the cylinder is wrapped with plastic or textile bands. This prevents the rubber from dripping or moving during the vulcanisation process.

Hannecard also uses 2 different procedures for the covering of rolls with polyurethane :

- A system with fast curing without mould.
- Casting system with slow curing with mould.

This choice is directly related to the composition of the mixture which needs to be applied. Certain elastomers are naturally better suited for one or the other process.



Hannecard develops **rubber** and **polyurethane** coverings

During the vulcanisation process the rubber obtains its **dynamic and elastic properties**



Vulcanisation is **fully automatically controlled**

4. VULCANISATION

This phase is exclusively related to rubber, as for polyurethane the cross-linking is obtained in a different way.

The vulcanisation process (or “baking process”) causes a chemical change which leads to cross-linking of the polymer chains. **During this process, the physical properties of the rubber are fully developed.** This is an irreversible reaction, since vulcanized rubber - unlike other materials such as plastics - can not be re-used or regained.

During the vulcanisation process the different rubber layers consolidate and form a homogeneous mass which attaches itself to the core.

Hannecard uses steam and hot air as a heat source. The autoclave (or steam oven) is fed by a steam boiler. Bringing it to a certain temperature level, the baking and cooling are controlled by computerized systems.

Polyurethane is cross-linked by the use of dry, electric ovens. The presence of moisture poses a danger for the proper conduct of this chemical reaction.



5. FINISHING

When the vulcanisation process is finished, the plastic- and textile bands are removed. For polyurethane coverings, the casting mould and flanges are removed. In the majority of the applications, mechanical post-processing is necessary, in order to achieve the correct size and the desired surface structure.

Hannecard offers different types of finishing, in function of the type of application.

- Cylindrical
- From very smooth to very rough
- Parabolic or hyperbolic camber
- Horizontal grooving
- Vertical grooving
- Spiral grooving
- Diamond-shaped grooving
- Etc.

RELATED DOCUMENTS

- Technical info - ‘Hardness specifications’
- Technical info - ‘Geometrical & Dimensional tolerances’
- Technical info ‘Mechanical services’
- Technical info ‘Roll finishing’
- Technical info ‘Selection guide’
- Technical info ‘Surface characteristics’
- Technical info ‘Transport & Packaging’

MORE INFORMATION?

For more information, please contact your local Hannecard partner or visit our website at : www.hannecard.com

6. FINAL INSPECTION

The dimensions and hardness of each covering are checked. Other parameters such as cylindricity, circularity, roughness etc. are often verified as well.

After the covering and the shaft ends are cleaned, the roll is packaged with a material that protects it against moisture and UV radiation.