



# TANIQ WINDING ROBOTS

Guideline for winding robots for reinforced rubber products

## TANIQ WINDING ROBOTS

TANIQ develops and supplies different winding robots customized for your products. The winding robot is developed for automated placement of fibre reinforcement structures and can also be used to lay up rubber sheets. TANIQ has chosen to develop their winding equipment using industrial robots. The advantages are that these robots enable better possibilities for customized solutions and the robots can also be used for other tasks in the production process. For the robotic equipment TANIQ works together with a renowned robot system integrator, VDL Steelweld. VDL has many years of experience in the field of robotic production solutions with customers in the industrial and automotive industry (e.g. Ford, Volvo, Opel, Volkswagen, etc.) which make them an excellent partner for TANIQ.

### ***1. Winding robot***

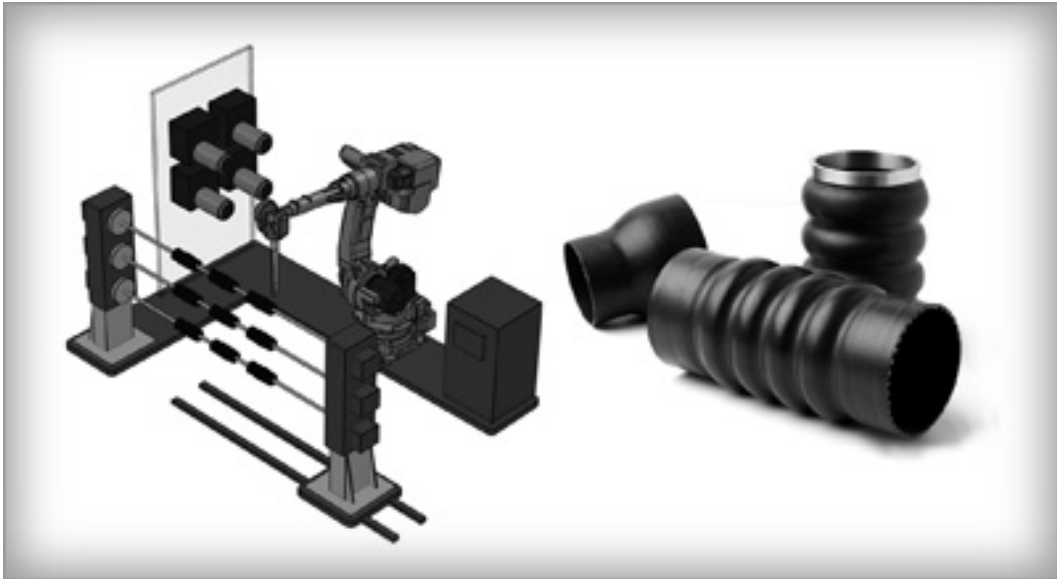
Instead of manual wrapping of rubber sheets reinforced with fabric reinforcement, TANIQ applies the rubber and the reinforcement structure in separate steps using winding robots. A winding robot set-up comprises a robot, a mandrel rotator, a fibre tensioning system and additional tools. In general one or more product mandrels are placed on the rotating axis of the mandrel rotator. The rubber liner can be manually applied while rotating the axis. Next the fibre reinforcement structure is wound on the product using a fibre feeding tool. After the reinforcement is applied on the product a protective rubber layer can be applied in the same manner as the inner liner. Finally a cotton tape can be wound over the product to compress the layers for vulcanisation. This tape can be applied manually or in an automated way using the winding robot.

The best winding robot for your production depends on your product specifications like size, weight and production volumes. Three set-ups for different types of products are presented here:

### ***1. Automotive hoses***

Winding robot for parts like **intercooler hoses, turbo charger hoses, shaped hoses and other types of charge air hoses.**

These type of automotive hoses are small parts. Multiple of these hoses can be placed in series one axis. Furthermore, it will be possible to place multiple axis parallel of each other. This way a high number of products can be manufactured simultaneously.



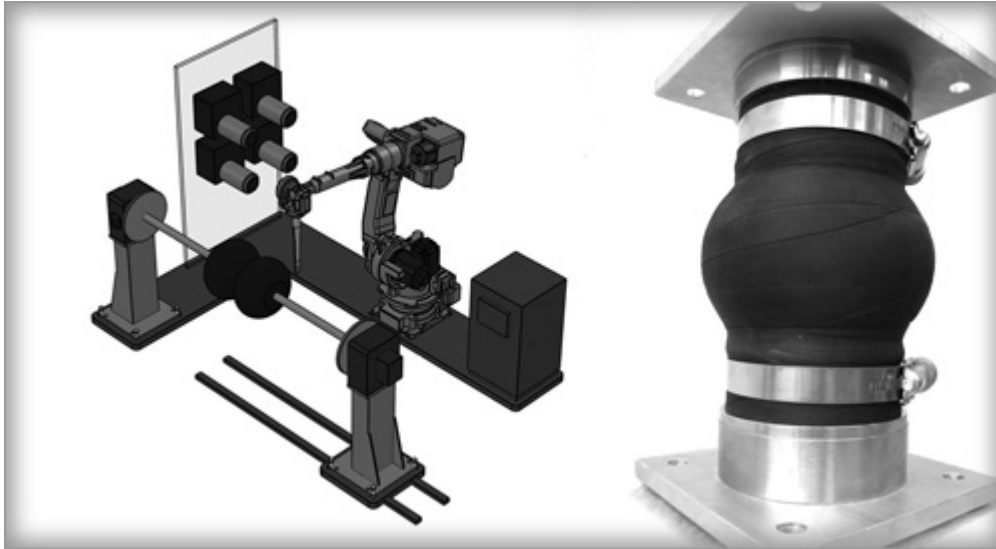
Advantages:

- Accurate fibre placement at high speeds
- High number of products at the same time
- A constant quality
- Minimal manual labour

## ***2. Industrial Products***

Winding robot for medium sized industrial rubber products like **lift bags, pipe-plugs, inflatable packers, expansion joints, etc..**

This production set-up is comparable with that of the automotive hoses described previously but the equipment, tools and production software are customized for medium sized industrial rubber products. Because these parts are typically larger the mandrel rotator is adjusted to enable rotation of heavier products at high speeds and accelerations to optimize the production time. The exact configuration will depend on your product requirements.

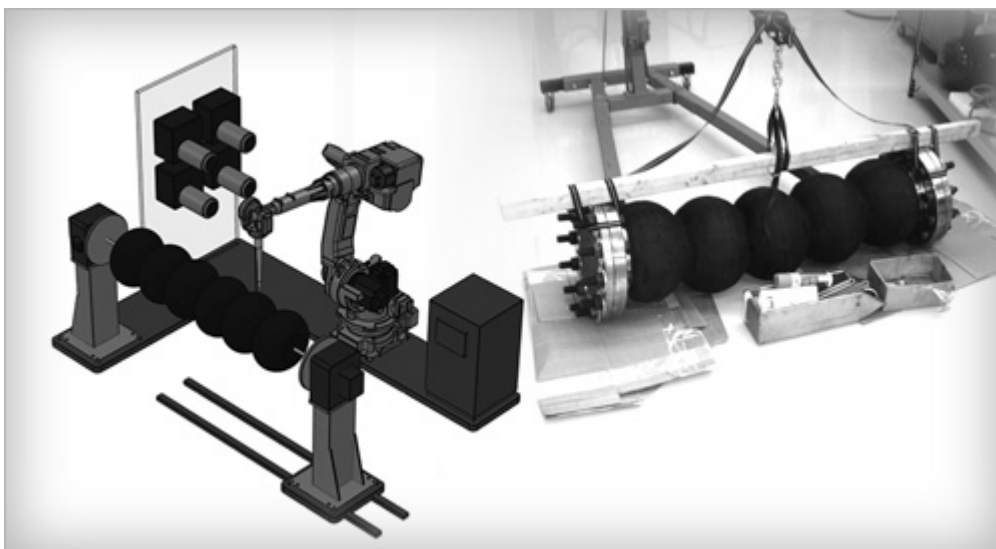


Advantages:

- Accurate fibre placement guarantees constant quality and safety
- Suitable for a wide range of medium sized products
- Minimal manual labour

### ***3. Offshore/Marine hoses***

Winding robot for large diameter rubber products like **suction hoses, dredge hoses, offloading hoses, floating hoses or other large diameter rubber hoses.**



For these large diameter hoses a heavier mandrel rotator is used. This enables to build products with large bore sizes and lengths up to 15 meters. For products longer than 4m the robot will be installed on a rail that moves parallel to the product during production.

Advantages:

- Accurate automated fibre placement
- Product range from 1-15m possible
- Minimal manual labour

### ***Integral solution for your reinforced rubber product***

TANIQ offers an integral solution for rubber product manufacturers from the design phase to setting up your production process. TANIQ's main activities are:

- Product development based on TANIQ's reinforcement technology
- Technology licensing
- Supplying winding equipment

Contact us if you are interested to discuss how TANIQ can assist you in optimizing your product performance and/or production process.