



# TANIQ MATERIAL POSSIBILITIES

Guideline for material possibilities

## TANIQ MATERIAL POSSIBILITIES

TANIQ's reinforcement technology is used to optimize reinforced rubber products by determining the optimal product shape and ideal fiber reinforcement structure. The choice of rubber and reinforcement material is independent to our technology. In general, you can use the same materials for your application as now. However, in many cases TANIQ's efficient material use creates possibilities to use less or other materials to reduce cost and improve your product.

### ***Rubber***

TANIQ is specialized in optimal fiber reinforcement. The choice of rubber for your product can be made by you and depends on the application. TANIQ has experience with processing different types of rubbers for prototype development. Most times, our customers provide the rubber and processing characteristics. In other cases together a supplier is approached to cooperate with during the project.

TANIQ already has experience with NR, NBR, SBR, EPDM, CR, PU and different types of VMQ, FVMQ and FKM.

- All types of rubber can be applied with TANIQ's reinforcement technology
- TANIQ works closely together with rubber compounders
- TANIQ has experience with processing of many types of rubbers

### ***New rubber possibilities with TANIQ***

One of the advantages of TANIQ's technology is that the reinforcement structure takes up all the forces. The result is that the rubber does not have to take up the shear stresses between rubber and fibers when the product is loaded under internal pressure. Therefore, the requirements for the rubber have changed. This sometimes means that a cheaper, lower grade rubber can be applied for the same application. Another possibility is that the application range has increased because the maximum stresses in the rubber are reached at a higher temperature or higher pressure.

- No shear stresses in rubber increases the performance range
- Same rubber can be applied at higher pressures or temperatures
- Less rubber or lower grade can be applied

## **Fiber**

TANIQ has the technology to exactly calculate the loading on each individual fiber in the reinforcement. By using accurate CNC equipment the fibers are placed on their optimal paths so they can use 100% of their strength. These principles can be applied to any type of fiber. The choice for a specific fiber depends on the application. TANIQ works closely together with fiber manufacturers like Teijin Twaron to stay on top of the latest developments. In most projects our customers have a type of fiber in mind, like Nylon or Aramid. Most of the times a specific fiber of that type is then selected together with the fiber supplier after testing with the selected rubber. TANIQ has experience with various types of Aramids (<sup>1</sup>Twaron®, Conex®, Kevlar®, Nomex®), Nylon, PET and steel cord.

- All types of fibers can be applied with TANIQ's reinforcement technology
- TANIQ works closely together with fiber manufacturers
- TANIQ has experience with many fiber types and steel cord

## ***TANIQ uses 100% of fiber strength which creates new possibilities***

Because the technology enables you to use 100% of the fiber strength, it becomes possible to use your materials more efficiently and use less material. Furthermore, now the exact strength and behaviour of the fibers can be calculated it is possible to apply high grade fibers in an efficient way, which makes them an interesting alternative for many applications. For some applications this makes it possible to replace multiple layers of a low grade fiber with a single layer of a high grade fiber like aramid.

- Use 100% of fiber strength and use less material
- Efficient use of fibers makes cost efficient use of high grade fibers possible
- Increase your product performance by replacing multiple layers of low grade fibers with a single layer of high grade fibers.

## **Adhesion**

A critical aspect with conventional reinforced rubber products is the adhesion between the reinforcement layer and the rubber. Especially with complex shaped products where the fibers are not placed on their optimal paths the adhesion and embedding of the fibers plays a critical role to maintain the relative positions of the fibers.

TANIQ places the fibers on their optimal positions where they are only loaded on tensile stress. This means that when they are loaded they do not want to re-position and exert

---

<sup>1</sup> Twaron® and Conex® are brand names of Teijin Twaron, Kevlar® and Nomex® are brand names of DuPont

shear stresses on the surrounding rubber. Therefore adhesion is less critical when using TANIQ's technology.

However, there are many reasons why adhesion might be required and during projects TANIQ works closely together with fiber manufacturers and rubber compounders to make sure that the best adhesion is obtained.