



# Rethinking and using natural rubber

Reliable and precise dosing opens up new levels of product and production freedom

**Natural rubber (NR) is known from many areas of application. What is less well known is that this material could be used much more widely if it could also be reliably dosed in small volumes. This is exactly what is now possible with a contactless dosing system and invites you to rethink and use natural rubber.**

**What has limited the use of NK from a manufacturing perspective so far?** Obtained from the milky sap of the rubber tree, natural rubber is known for its unique combination of elasticity, flexibility and resilience. It has excellent mechanical, dynamic properties, such as high tear resistance, very high tensile strength and high elasticity (up to 800%). Whether in the automotive industry for the production of tires, in medical technology for the manufacture of latex gloves or in the textile industry for elastic fibres - the raw material is omnipresent as long as it is processed in larger volumes. If smaller volumes have to be dosed, reliable processing quickly reaches its limits (Fig. 1). A key criterion in the processing of natural rubber is the fast reaction of the material, which in turn defines the production process. It is not for nothing that gloves or condoms, for example, are usually processed

by dipping. When dosing NK, these short reaction times lead to problems. This starts with the conveying to the dosing device, but at the latest when the system comes to a short standstill. Natural rubber hardens, i.e. it changes its viscosity and makes precise dosing impossible. This is why natural rubber was not an option for many products, even though the material properties would have been ideal.

**The solution - contactless dispensing** - Initial projects (e.g. dispensing nubs on condoms) with the PDosX1 jet valve have shown that even very small volumes can be applied precisely and reliably in a fully automated process (Fig. 2). The dispensing process is so fast that the material has no opportunity to react and only hardens where it is required. The contactless dispensing of natural rubber thus opens up the prospect of being able to use a natural material in many industries - an aspect that is becoming increasingly important in the context of environmental and health protection. In Germany, however, the Supply Chain Duty of Care Act (LkSG) should be observed when using this material (see box).

In principle, the fast application rate of up to 300 shots per second enables the efficient manufacture of products that benefit from new degrees of freedom in

## **Practical tip** by Julian Greiner:

*The dosing system can withstand downtimes of up to 14 days. Production can continue immediately after 100 empty shots. No cleaning of the system is necessary if the media feed is designed accordingly.*



terms of product design and the design of the manufacturing process. Products made from natural rubber can now be rethought:

- One example is medical components, where miniaturization and large-scale production are playing an increasingly important role.
- In the electronics industry, natural rubber can be dispensed onto ever smaller and more flexible electronic components, where its good insulating properties can be put to good use.

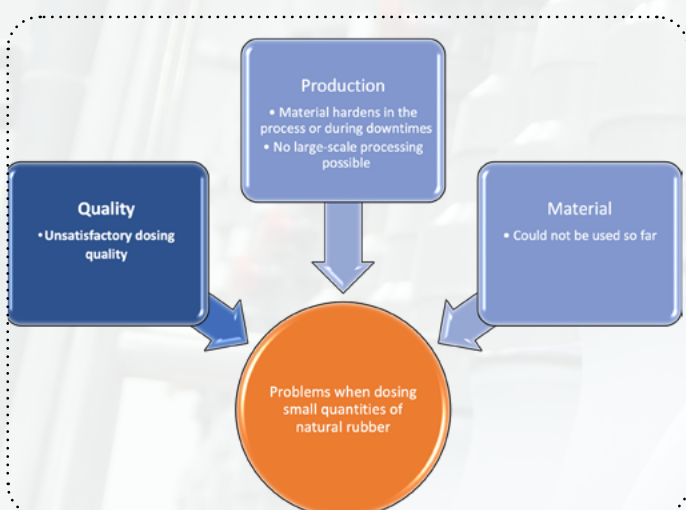


Fig. 1: Common practical problems that can be solved with the right dosing technology (Image: perfecdos GmbH)

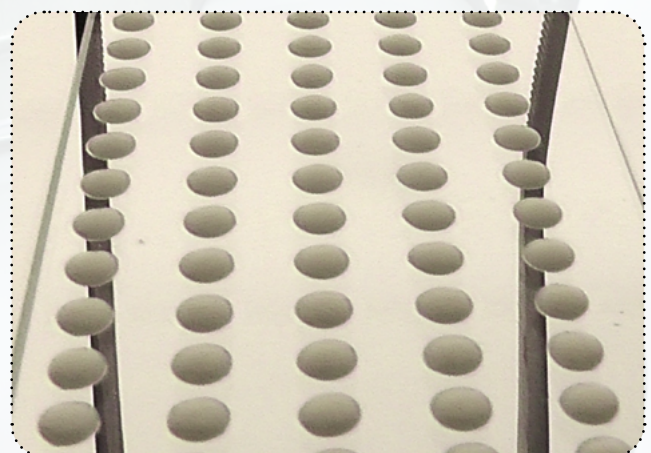


Fig. 2: With a cycle frequency of 300 Hz, a high dispensing frequency is achieved at a distance of 50 mm for horizontal and overhead shots - even with natural rubber, whether as dispensing points or geometric shapes such as rings (Image: perfecdos GmbH)

# Fast: 300 cycles/s

## Repeat accuracy: >99%

## „Enabling potential: high

Image: iStockphoto\_CollinsChin

- In the food industry (Fig. 3), new packaging solutions can be realized on the basis of precisely dosed natural rubber.

- Where would you like to use NK?

The precise non-contact dispensing of natural rubber with the PDos X1 jet valve (Fig. 4) is **a concept that opens up new perspectives for this material**. Compared to other processes, which are usually not used for the reasons mentioned, non-contact dispensing uses less material, produces fewer rejects and has simple process control. This saves a lot of money while increasing quality. From a total cost of ownership perspective, 300 cycles/s allow faster production and the simpler

machine design saves money. All in all, many aspects speak in favor of this concept. Irrespective of this, the non-contact dispensing of natural rubber marks a milestone in the industrial application of this versatile material. Overcoming the previous „dosing limits“ opens up new horizons for the use of natural rubber

I would be happy to support you with your project

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**What to consider when using NK in Germany** - On June 11, 2021, the German Bundestag passed the Supply Chain Due Diligence Act LkSG. The law regulates the responsibilities of companies for human rights violations and environmental damage in their supply chain. The law came into force on January 1, 2023. A stricter version came into force on January 1, 2024.

Even though the LkSG only applies to companies with more than 1,000 employees, it has a huge impact on small and medium-sized companies. In the B2B sector, customers of these companies will demand proof from their suppliers in accordance with the LkSG. It is essential to prepare for this.

[The system in the video](#)

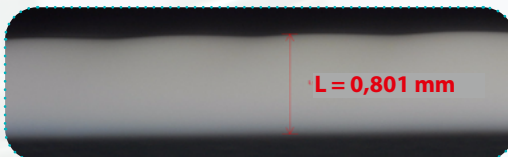


Fig. 3: Minimum line widths of up to 0.8 mm are already feasible today (Image: perfecdos GmbH)

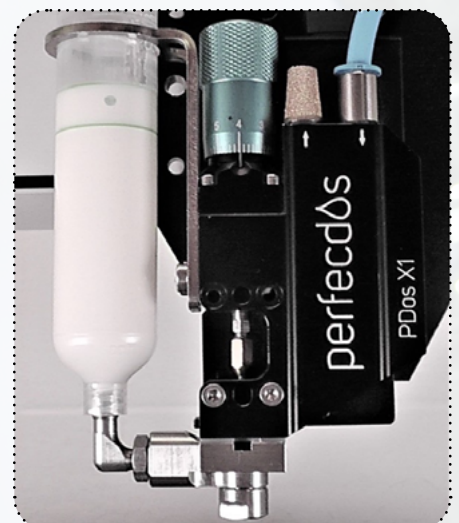


Fig. 4: All-rounder for dosing very small quantities - even of natural rubber also of natural rubber (Image: perfecdos GmbH)