

SmartMarker[®]

The unique identifier for your product.



Authentication and identification of plastics.



Röchling Group

The Röchling Group has been shaping industry. Worldwide. For 200 years. We transform the lives of people every day with our customised plastics: they reduce the weight of cars, make medication packaging more secure and improve

industrial applications. Our workforce of around 11,700 people is located in the places where our customers are – in more than 90 locations in 25 countries. The Group's three divisions generated joint annual sales of 2.603 billion euros in 2022.

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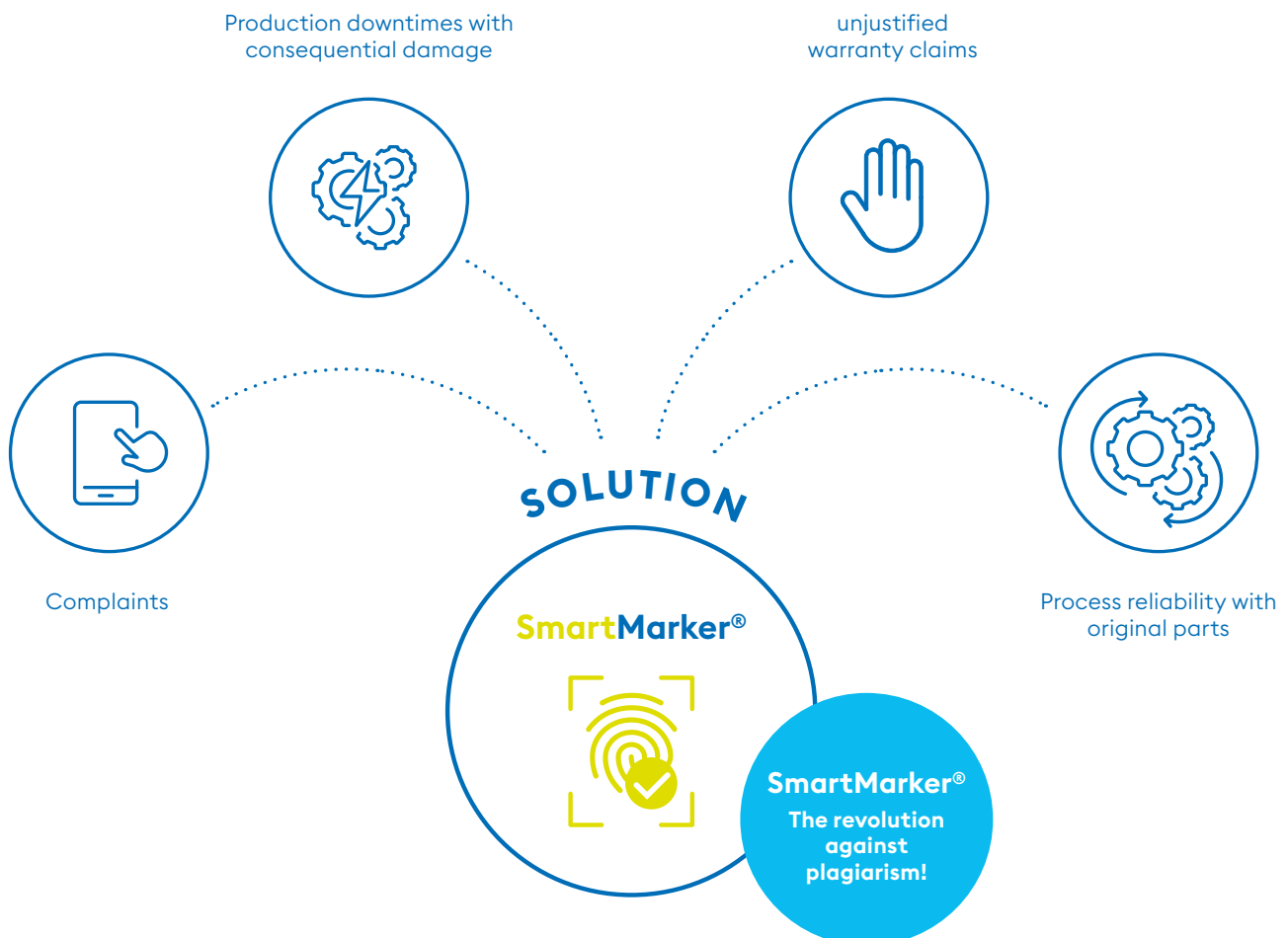
SmartMarker®

The cost-effective way to increase your turnover

SmartMarker® is the innovative marker technology that can be used to unambiguously assign individual components to a manufacturer. This way, you can easily use a hand-held scanner to check whether a component was really manufactured in one of your plants – any time, any place!

From problem to solution

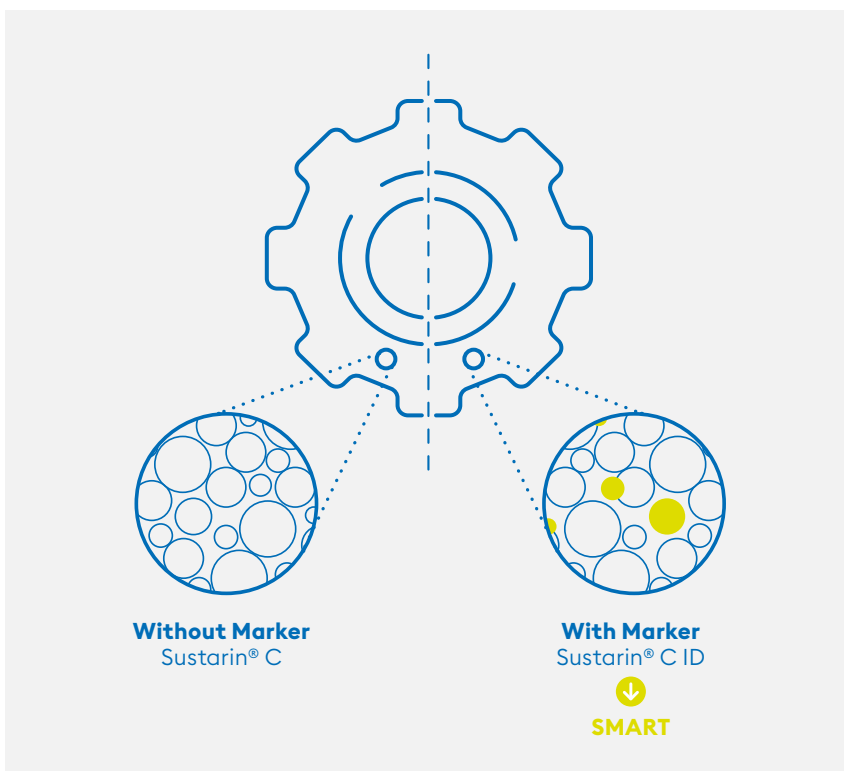
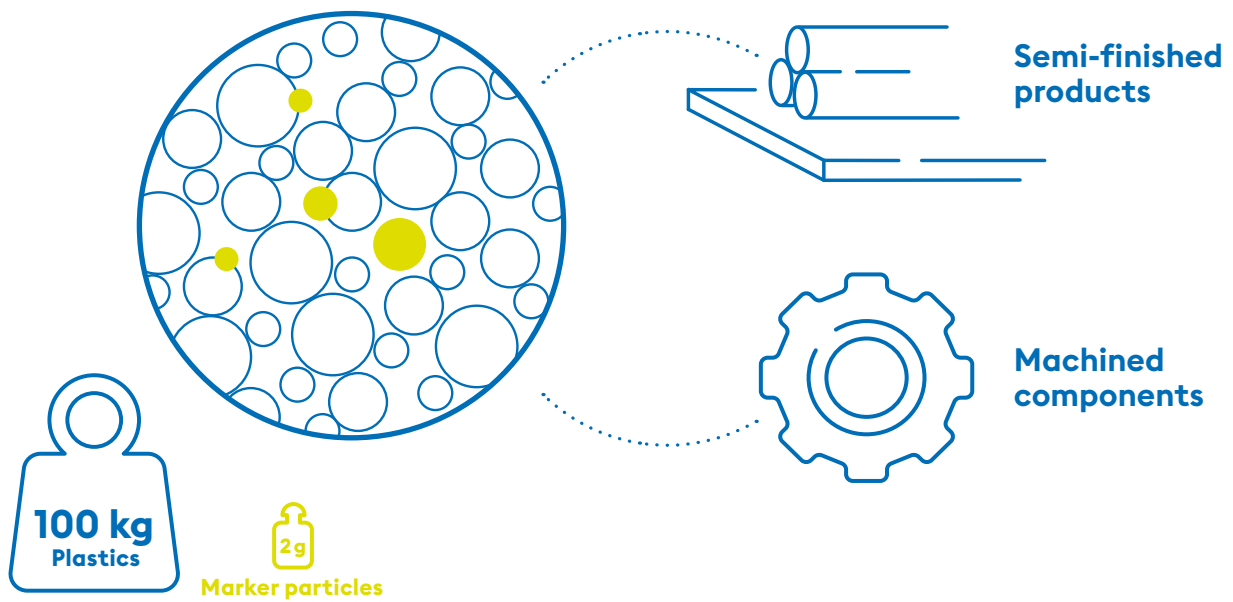
Have you ever had a customer complain about a component that you allegedly supplied? The rejected component could have even resulted in a standstill with consequential damage. This presents a risk of trouble, costs or even damage to the company's image. With SmartMarker®, you can counter false claims and check whether a component subject to complaint was really manufactured in one of your plants. You can also use it to invalidate false warranty claims and counteract production downtimes. This increases customer satisfaction as well as turnover. If a machine only starts up with original parts that are marked using SmartMarker®, only original parts can be used in production. **The resulting process reliability has a positive effect on machine utilisation and consequently increases your turnover!**



Unchanged material quality

What are SmartMarker®?

SmartMarker® are tiny, fluorescent particles. We mix these invisible particles with your plastic, thus giving each component a unique identifier. **The technical functions of your material are not impaired in any way and retain their usual quality.** The plastic to which SmartMarker® particles have been added is then processed into your end product. The production process is not affected by the SmartMarker® particles and can be performed as usual. The material quality of your end product is also not affected by the low number of marker particles used, as **only approx. 2 g marker particles are used on 100 kg of plastic.** The semi-finished parts or machined component to which SmartMarker® has been added can then be easily assigned to your production with the help of authentication and identification.



Future production

More choice based on the SmartMarker® variant

When selecting your products, you will soon be able to choose between your standard product and an equivalent SmartMarker® variant.

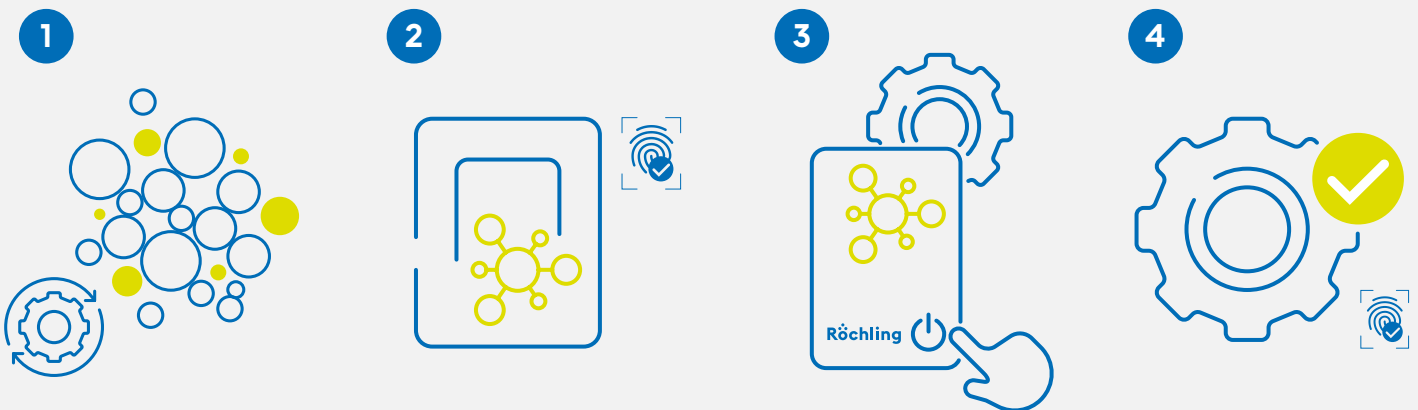
The SmartMarker® variant is qualitatively equivalent to its standard variant and differs only in the tiny marker particles added to the plastic. The future product variants to which SmartMarker® has been added will be marked with the suffix "ID". That way, you can easily choose between your usual standard product and a "smart" variant.



The SmartMarker® process

Make your product unique

How can you benefit of SmartMarker® advantages? All you need is a handheld scanner designed for SmartMarker®. The entire process from manufacturing to authentication is explained below:



Fluorescent particles (SmartMarker® particles) are added to the standard plastic. Any type of plastic can be used.

The product is manufactured according to the conventional production process. **SmartMarker® has no influence on its material properties.**

To be able to recognise the product as a Röchling product, the processed SmartMarker® particles are made visible using special measurement technology.

The handheld scanner indicates whether there are SmartMarker® in the product. **This proves that the product was manufactured in one of your production facilities.**

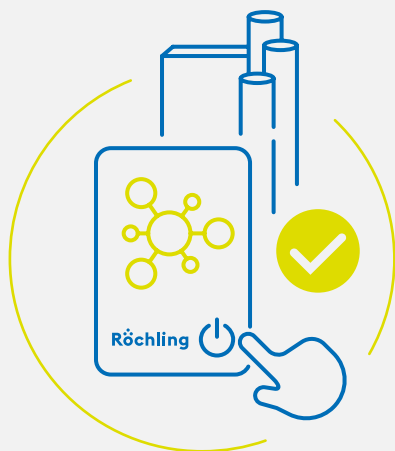


Authentication & Identification

Application areas of this digital fingerprint

Think of your SmartMarker® marker as an **individual fingerprint** that ensures your product can be recognised any time, any place. Just as a fingerprint identifies an individual, SmartMarker® particles can be used to easily authenticate or identify your product.

Authentication



A hand scanner is used to scan the SmartMarker® particles in a component. If marker particles are present, it is recognised as an original component. Is it a Röchling product? Yes or No?

Identification



Through identification, each product receives a unique product passport in which all necessary information can be stored.

Authentication

The benefits to you:



How does authentication work?

As soon as you want to check whether a product has really been manufactured in one of your production facilities, you can easily do so based on the SmartMarker® particles. To this end, measure the product to be authenticated using a small, mobile measuring device. The handheld device scans the surface of the product. **The result will be available in a few seconds. If SmartMarker® particles are detected, you have proof that the product was manufactured in one of your production facilities.** After all, only products from your own production line have these particles.

What are the benefits of authentication?

10 % of the world's products are counterfeit. This results in losses of billions of euros each year due to unjustified liability claims. With SmartMarker® authentication, you can cost-effectively counteract these counterfeit products by proving that a claimed counterfeit product was not manufactured in any of your facilities. **These marker particles used in the SmartMarker® process are counterfeit-proof.** Detection is possible without special qualification directly on the surface of the component subject to complaint. In future, it will no longer be necessary to remove the component in question and then test it in the laboratory!

Identification

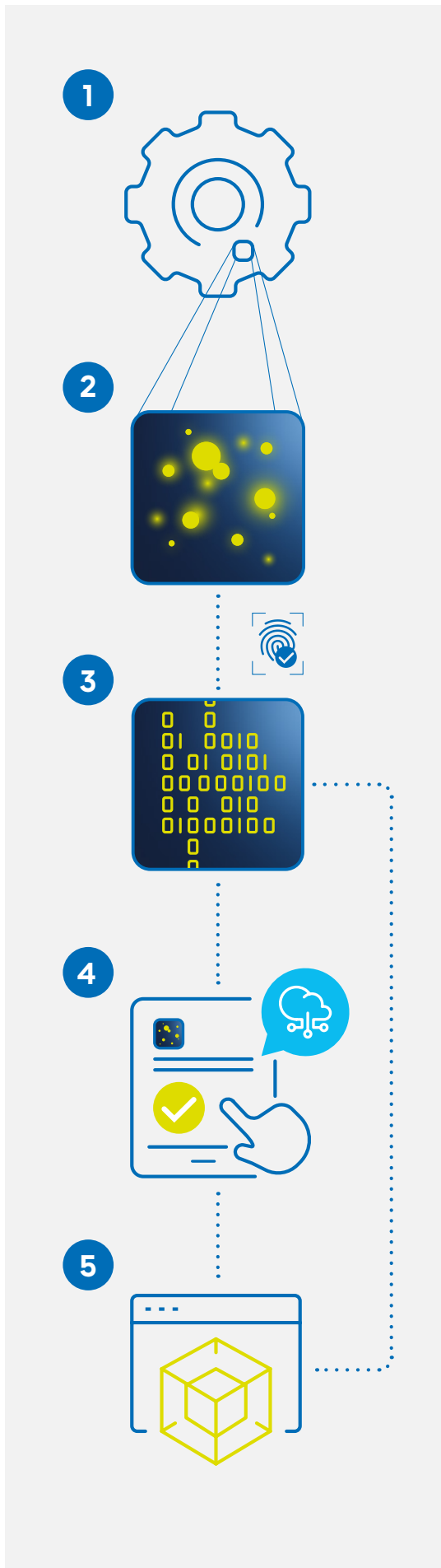


The digital product passport for final components

Identification is the extension of authentication. When the marker particles are added to the starting material in the first step of the SmartMarker process, a random and thus unique pattern is created by the random distribution of the SmartMarker® particles. This makes it counterfeit-proof. The product now has a unique label that is anchored in the

material and used to uniquely identify it. This unique identifier serves as a unique identifier for uniquely linking the product to a product passport. This means that the product passport can be opened any time and can be provided with various product information. This product information can be accessed digitally and does not have to be physically attached to the product.

How does identification work?



Define the reference surface

To be able to reliably identify a component marked using SmartMarker®, it has to be stored in a digital database. To that end, a reference surface is defined on the component. On this surface there is a random particle pattern of the SmartMarker®. This particle pattern is scanned using the camera.

Encoding of the image

A photo of the particle pattern is taken. This photo is then encoded and a unique ID number consisting of a multi-digit numerical code (hash key) is assigned to this coding. This numerical code now represents the product and can be used as a link to a digital product passport.

Feed into the database

Image encoding and ID number are saved in an image database. Now, digital product information can be added to this code, such as serial number, material, production date, order number etc. This way, the identified particle pattern is directly related to the component.

Identification

Identification is performed later using a camera. To do so, the newly created image is encoded again and compared to the existing encodings of the image database. If these codes match, the ID number previously assigned to the component is output and can be used as a link to the product passport database. In this way, the information on the component stored in the product passport can be accessed: If there is no match, this is a clear indication that the component to be identified has not yet been entered in the database.

Portus

The product passport is stored in Portus, the digital IoT platform, and can therefore be retrieved at any time. In Portus, you can access all relevant and predefined data from your machine. Your mobile device can be used for that purpose. This means that you can access the necessary product information for your components anywhere and at any time.

Portus is our cloud-based database where product information is stored and accessed.



Your full-service provider – the comprehensive solution

SmartMarker® as a technological successor

Do you currently use RFID chips, QR codes or barcodes? Then you'll be familiar with the disadvantages of these technologies. For instance, the high cost of implementing RFID chips or the susceptibility to counterfeiting of QR codes or barcodes can cause problems.

RFID chip



- high effort & costs for insertion
- all product information is lost when the chip is lost
- influence on the material structure & technical properties of the product

QR code



- not counterfeit-proof, as stickers can be replaced with counterfeits
- They can also be soiled, torn off or partially destroyed so that the QR code can no longer be recognised

Barcode



- not counterfeit-proof, as stickers can be replaced with counterfeits
- They can also be soiled, torn off or partially destroyed so that the barcode can no longer be recognised



Thanks to SmartMarker® as the successor to these technologies, you can avoid all of these disadvantages in the future. Unlike RFID chips, QR codes and barcodes, SmartMarker® products ensure that all (product) information is securely embedded in the end product and can be accessed any time – even if parts of the product are no longer present due to wear or defects. SmartMarker® particles are not only counterfeit-proof, but also do not affect the technical properties of the products, as is the case with RFID chips, for example.

Areas of application

Fewer problems, higher turnover

The uses of SmartMarker® for your production are manifold. The unmistakable marking of the components allows you to ward off unjustified complaints, giving you more time for faster and more efficient processing of justified complaints. In addition, your customers can be sure that they are purchasing an original product that meets their high quality standards. Verification of the use of original components by the sensors in the machines also ensures greater process reliability and reduces the risk of production errors or failures.



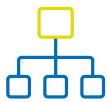
Complaint handling & counterfeit protection

SmartMarker® provides a unique authentication option. By quickly distinguishing between original and counterfeit products, you can react to complaints in a targeted manner.



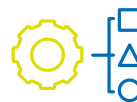
Unjustified warranty claims

SmartMarker® can be used to clearly determine the production year of each individual product. Should warranty claims arise, checks can be performed as to whether the warranty is still valid.



Sorting of production waste

SmartMarker® makes for efficient sorting of components and production waste. That way, the efficiency of the recycling process can be increased and the individual materials can be sorted according to type.



Unique allocation

By means of identification, components can be assigned to their production processes and assembly lines. The traceability of components and products is improved, sources of errors are minimised and process reliability is increased.



Material passport

By identifying the products provided with SmartMarker®, specific product information for each individual component can be stored and accessed digitally.



Reference for a digital twin

By digitally storing the product information, a digital image of the real product can be created.

**Curious about your future
using SmartMarker®?
Book an appointment now!**

Let's explore together how you can best use SmartMarker® for your production and components. Whether it's protection against complaints or increased sales, we will find the optimal solution to your problem.



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**Do you have a
project that you would
like to implement using
SmartMarker®?**

**Arrange an appointment
now without obligation!**

