

# UPDATE *Medical Plastic Systems*



Gx® G-Fix™ standard adapter for precise and reliable positioning of syringes and needle shields.

## Interface between syringe and device

Patent for Gx® G-Fix™ standard adapter is pending

The development of autoinjectors generally involves the integration of a pre-filled glass syringe into a plastic drug delivery device – a major challenge due to the different tolerances of both materials. Gerresheimer has now filed a patent application for its Gx® G-Fix™ standard adapter for precise and reliable positioning of syringes and needle shields.

Drug delivery devices play an increasingly important role in the market for pharmaceutical products. A rising number of patients suffering from chronic diseases such as rheumatism, arthritis or Parkinson inject their drug themselves with help of autoinjectors.

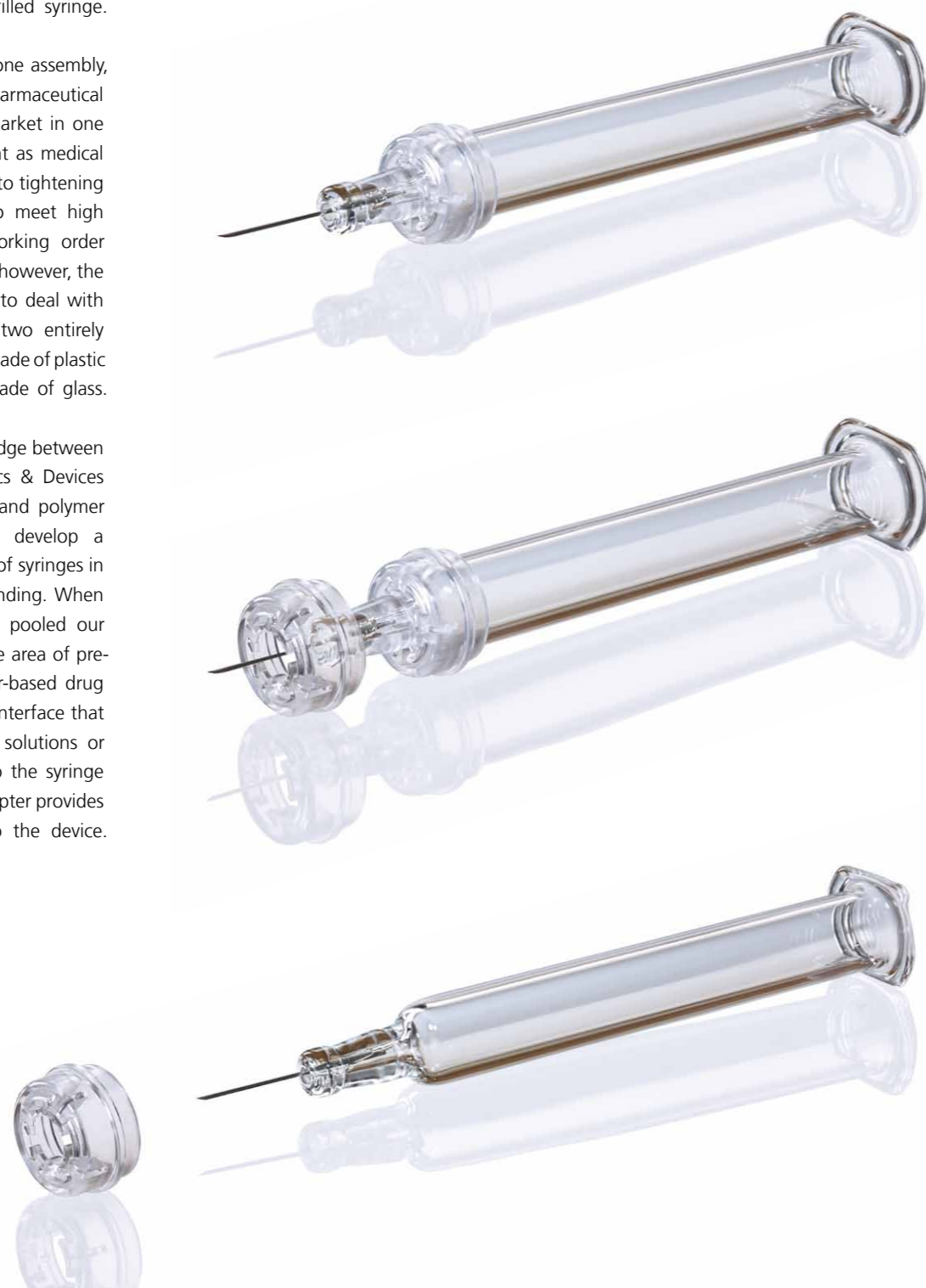
Self-administering drugs in this way obviates the need for regular visits to the doctor, is more comfortable, and relieves the health care sector. Between 2009 and 2013 autoinjector sales rose from 38 million to 58 million items, and this trend also applies to pre-filled syringes.

## A bridge between glass and plastics

Most autoinjectors contain two main modules: the injector itself and the pre-filled syringe.

Both modules are combined in one assembly, which is specified by the pharmaceutical company and supplied to the market in one piece. This approach is important as medical technology products are subject to tightening statutory requirements, need to meet high quality standards, and their working order must be guaranteed. In practice, however, the production of autoinjectors has to deal with the tolerance requirements of two entirely different materials: the device is made of plastic while the pre-filled syringe is made of glass.

Gerresheimer has now built a bridge between these two materials. Our Plastics & Devices Division is the expert for glass and polymer products. This allowed us to develop a solution for the easy integration of syringes in drug delivery devices, patent pending. When we developed Gx® G-Fix™, we pooled our comprehensive intelligence in the area of pre-filled glass syringes and polymer-based drug delivery devices and created an interface that works without complex design solutions or assembly processes. Attached to the syringe shoulder, the plastic standard adapter provides a precisely defined interface to the device.



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Inside of an autoinjector the Gx® G-Fix™ can undertake several functions.

## Higher break resistance

In the autoinjector, Gx® G-Fix™ has several functions. It connects syringe and device. During self-injection, the front of the autoinjector with the needle opening is applied to the skin. Before, the high dimensional tolerance of the glass syringe made it hard to control the position of the injection needle in this opening. As a result, the penetration location and depth could not be accurately defined. As Gx® G-Fix™ is specifically adapted to the autoinjector, it allows accurate needle positioning and a significantly higher control of the injection process.

The syringe is also better protected from breaking. Conventional products couple the syringe to the finger flange. When triggered, the structurally sensitive flange – not built for this purpose – is subjected to a lot of pressure and can easily break. If the finger flange breaks, the autoinjector will cease to work at the critical moment. Similarly, breakage is a risk when the autoinjector impacts on a hard surface. Attaching the syringe to the sturdier shoulder minimizes the risk of breakage during transport and use.

The standard material for the Gx® G-Fix™ is polycarbonate. This cost-effective material has been tried and tested in medicine technology applications. It is impact-resistant and can withstand the load applied when the injector spring is triggered. It is also resistant to any impact from a fall. If required, Gx® G-Fix™ can also be supplied in other materials.

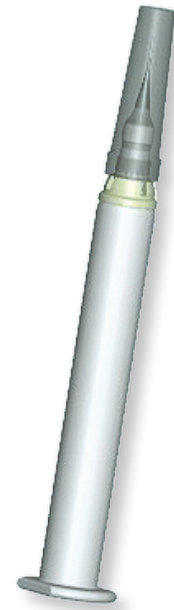
## Precise positioning of the rigid needle shield

As a second function, the Gx® G-Fix™ allows the defined positioning of the rigid needle shield (RNS). As most autoinjectors are equipped with long 1ml syringes, tolerances often result in a repositioning of the RNS either towards the front or towards the rear, which means that RNS removal requires autoinjector caps with a complex design. This problem can be solved by using a variation of the adapter that connects with the RNS. With a clearly defined position, RNS removal no longer requires a specifically designed injector cap.

Both Gx® G-Fix™ functions (RNS positioning on the syringe and accurate positioning of the syringe in the injector) are available separately or in combination.

### Suitable for glass and plastic

Plastic syringes can be easily fitted with the adapter. Autoinjectors compatible with Gx® G-Fix™ can be equipped with plastic or glass syringes and are suitable for a variety of drugs.



## Easy device development, easy assembly

Gx® G-Fix™ creates a defined point of reference that allows safe and easy device integration and a precise positioning of the RNS. This significantly reduces the cost and time required for complex autoinjector designs.

Costly special solutions such as additional metal parts to facilitate the removal of the RNS or two-component injection molded parts for the integration of the pre-filled syringe are no longer necessary.

The adapter is assembled during the ready-to-fill process at our Bünde facility. The final packaging is identical to that of standard syringes (nest trays and tubs). There is no need for any changes to the customer filling station.



It does not require any changes to the customer's filling station.

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