

## **SAFELIA® 1 ml and 2,25 ml AUTOINJECTORS** DESIGNED TO BE PATIENT AND SYRINGE FRIENDLY

Nemera's new generation 2-step autoinjector platforms are suitable for fluid to highly viscous injections. Safelia® has been designed to ease patient self-injection experience and to deliver even the most challenging drugs (viscous formulations up to several Centipoise, sustain released, concentrated, fragile and shear sensitive formulations, either in subcutaneous or intramuscular layers, on two platforms: up to 1ml or up to 2.25ml delivery).

Injectable formulations are the fastest growing segment in the pharmaceutical landscape. Biological therapies are increasingly used to treat a wide range of chronic diseases requiring frequent drug administration over a long period of time. Developing drug delivery devices able to administer the future pipeline of biological molecules is a challenge.

Biotherapeutics tend to be more viscous, concentrated and administered in larger volumes. The issue of patient adherence to their treatment is an additional challenge.

Pharmaceutical companies tend to provide treatments with less frequent injections, more concentrated, with larger volumes to be injected. Autoinjector platforms have to evolve to adapt to these new parameters as well as integrating an optimized patient experience. Other key factors that can improve patients adherence to their injectable treatment are pain reduction, less bruising and shorter delivery times. Nemera's Safelia<sup>®</sup> autoinjector platforms have been designed to respond to challenges of handling new formulations while taking patient needs into consideration. Safelia<sup>®</sup> autoinjector platforms:

- administer a large range of formulations and injection volumes; adapt to handle liquid injections to highly viscous formulations, taking specific care of the biologics; support sustained-released formulations delivery and shear sensitive molecules up to 2.25ml injection volumes
- improve patient experience with the possibility to reduce needle gauge and injection time; slows down needle penetration inside body tissues; tailor-designs injection course to limit pressure peaks into body tissues and makes delayed retraction possible to allow enough time for body tissues to absorb the injected drug.

### **BREAKTHROUGH TECHNOLOGY OF AUTOINJECTOR**

#### SAFELIA® - 2-STEP AUTOINJECTOR (AI) FOR 1ML AND 2.25 ML FLUID AND VISCOUS FORMULATIONS

Expected benefits	Standard Al	Safelia® Al	Features	
Creating possibilities for viscous injections with the same AI platform as for standard glass syringes	×	<b>√</b>	Injects fluid and viscous drugs up to 1000 cP	Safelia Pud or viscous dugs autoinjection I nal syringe
Eliminating the risk of syringe breakage with the possibility of using all (or no) syringe flanges	×	<ul> <li>Image: A second s</li></ul>	No stress on syringe flanges	
Enabling increased spring force and use of small gauge needles (less patient pain) without risk of glass breakage	×	<ul> <li>Image: A second s</li></ul>	Manage energy shock wave inside the autoinjector	
Ensuring correct delivery depth of the drug	×	<ul> <li>Image: A second s</li></ul>	Needle insertion disconnected from injection	
Reducing pain during injection	×	<ul> <li>Image: A second s</li></ul>	No initial injection peak Tailoring the injection course	
Reducing pain at needle insertion	×	1	Adjust needle insertion speed and benefit from possibility to adapt smaller needle gauge	



Nemera's Safelia<sup>®</sup> autoinjector design is patented and includes the ability to handle high injection spring forces and deliver formulations in standard glass syringes. The autoinjector is not supported by the syringe's flanges, which are structurally weak, but rather by the syringe's shoulder, allowing spring forces up to 70N with standard autoinjector plastic parts. If higher viscosities are required to be delivered in less time, the autoinjector can be adapted with stiffer springs and adjusted materials.

The spring release shock and energy are absorbed by a rotating cam system (patented), and the energy is transmitted in compression and attenuated to the primary container. Risks of breakage are therefore reduced during the firing of the autoinjector but also during transportation or handling (dropping) of the device.



### Safelia<sup>®</sup> autoinjector

- syringes held by the shoulders
- stress on syringe is reduced (maximum stress calculated at impact location, on syringe shoulder)
- von Mises stress is in compression, presenting less risk for cracking or breakage of primary glass container

# Marketed autoinjector

- syringe is held by the flange
- high tensile stress (maximum calculated at the flange level) and long shock wave propagated along syringe barrel
- von Mises Stress is in extension

Safelia<sup>®</sup> autoinjector platforms are available for customization in 1ml and 2.25ml versions, depending on the delivery specification of your formulation. Both IM and SQ designs are available. Examples of different tailored designs that adjust injection courses during delivery can be tested to better fit your formulations. Consult us for details.

Nemera has a well-know and established reputation in designing, developing and industrializing parenteral devices.

As an example, **every day** over **5 million** diabetics rely on devices manufactured by Nemera in our 4 manufacturing plants with harmonized high standard quality. Upstream of the production of pens, autoinjectors, and implanters, we rely on the expertise of our Innovation Centre of Development. Safelia<sup>®</sup> development has benefited from the implication of creative design and human factor specialists, mechanical engineering, testing in our world-class Laboratory, manufacturing and assembly knowledge and extensive mathematical modeling.

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