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A portrait of Dr. Elias Knubben, a man with short brown hair and glasses, wearing a dark suit jacket over a white shirt. He is looking slightly to the right of the camera with a neutral expression. The background is a blurred modern building with a grid of windows.

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Research & Innovation @ FESTO
Dr. Elias Knubben Festo SE & Co. KG



Incredible Machine

Celebrate 100 Years of Festo

- Company Portrait
- Large Gesture
- Presentable Worldwide

Playful Proof of Core Competence: Motion

- Show a variety of motion types
- Realized as a real-world exhibit

Display of the Festo Spirit

- From the beginnings to the future
- Butterfly Effect as narrative

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Film Festo incredible machine:

<https://youtu.be/pUcspVfzBxM?si=mnKudYKgTFmfPdkN>

We Move, Handle and Weigh Without Contact with **SupraMotion**

Superconductor-based **magnetic levitation**

For demanding **cleanroom applications**:

- in semiconductor & battery
- in biotechnology & lab-automation
- In pharmaceutical & medical industries

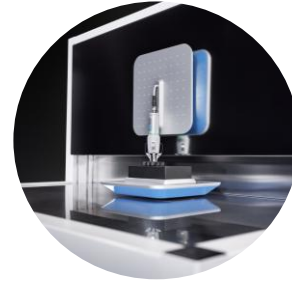


History

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First application example



Festo SupraModule



Pilot Applications

2010

2015

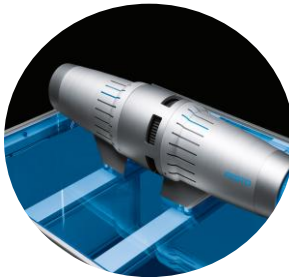
2020

2025

2026



First Festo Cryostate



Festo superconductive motor



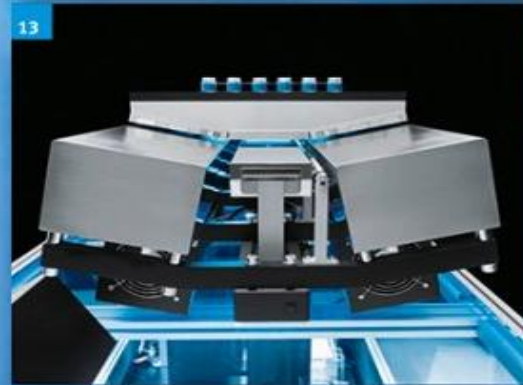
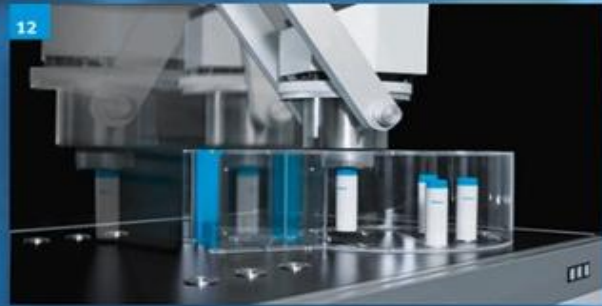
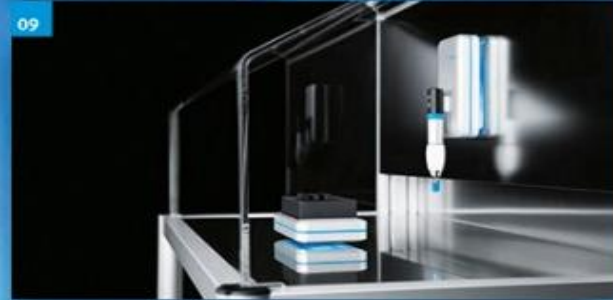
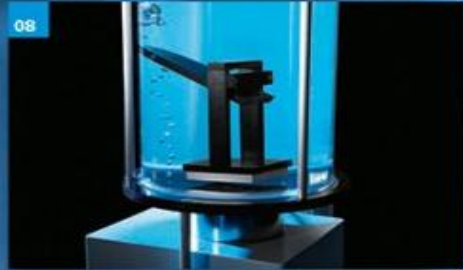
Festo SupraCube



BioPrint Demonstrator

SupraMotion

Applications and Motion Concepts with Superconductivity



01 SupraTube

04 SupraGripper

07 SupraDrive

10 SupraLoop

13 SupraDrive 2.0

16 SupraHandling

19 SupraChanger

02 SupraTransport

05 SupraHelix

08 SupraSensor

11 SupraHandling 2.0

14 SupraJunction

17 SupraCycle

20 SupraShuttle

03 SupraLinearMotion

06 SupraMultitool

09 SupraModule

12 SupraPicker

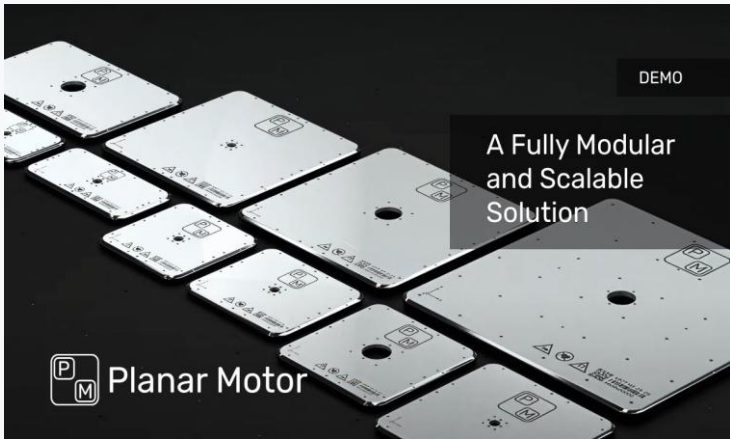
15 SupraShaker

18 SupraCarrier

Competition

Comparison with alternative levitation technologies shows clear USP:

- Large levitation gap
- Minimal heat emission
- High energy efficiency
- Relatively simple handling
- Suitable building block in the Festo motion portfolio



Cryostats Development



- Improving Insulation & Efficiency
- Cost reduction
- Improvement in service life
- Easier handling

- Floating heights up to 10mm
- Load capacity from 0.5kg to 20kg
- Power requirement 8-35 watts
- Digitally operable and monitorable

Superconductivity allows new options

- **Alternative concept** based on ice packs
- Significant **cost reduction** due to several cryostats for only **one cooling unit**
- **Significantly smaller** in installation space
- Charging time: 30 min
- Useful life: 2 hours



Contactless motion of goods

Application Moduls for Life Siences

- Fully automated **contact-free transport** and handling of vials inside a clean or sterile environment.
- **No abrasion generated** or lubricant required for highest demands on cleanliness.
- **Motion** is realized by mounting the cryostats on e.g. a linear axis or the end of a robotic arm.

Film Festo SupraModule:

<https://youtu.be/AJAFpyDSusU?si=izEHEFqTns1LQuiA>

SupraSensor

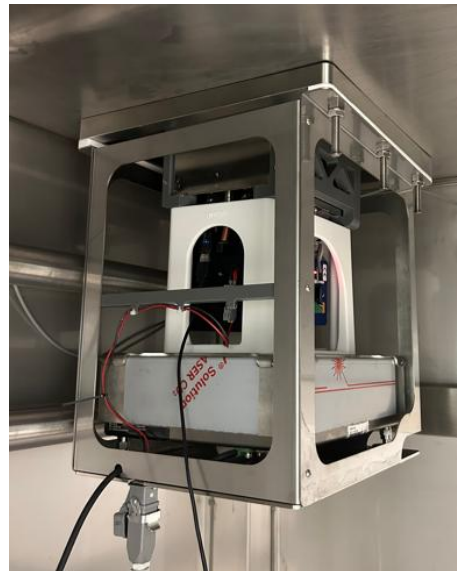
Contactless weighing in pilot applications

- A leading pharmaceutical manufacturer is **weighing a toxic powder** inside an isolator.
- In fact, of the toxic powder the isolator has to be **cleaned at great expense**
- The **scale inside the isolator breaks** after a few cleaning cycles (every 6 weeks: 10.000€)



SupraSensor

A SupraSensor allows the scale to remain outside the isolator.



— Organs-on-Chips | BioPrinter

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Film Festo Organs on a Chip:

<https://youtu.be/V4PW7vV9VHQ?si=ehqlftkRGFLafoIF>

**Thank you for
your attention!**

A 3D rendering of a futuristic automation system. The scene is set in a clean, white, grid-patterned environment. In the center, a large, white, cylindrical robotic arm is suspended in the air, supported by a complex system of white metal beams and cables. Below the arm, a blue platform is levitating. To the right, a digital display shows the weight "103552 mg". In the background, there are more industrial structures, including a large, multi-layered cylindrical structure with a rainbow-colored spiral pattern. The overall aesthetic is clean, modern, and high-tech.

103552 mg

We are convinced: Levitation will be part of future automation