

✓ VISCOTEC PUMPEN- U. DOSIERTECHNIK GMBH

PERFECTLY DOSED!

KLEBSTOFFSEMINAR BODO MÖLLER

TÖGING AM INN, 16/05/2024





AGENDA

01 COMPANY OVERVIEW

02 TECHNOLOGY

03 PRODUCTS & INDUSTRIES

04 APPLICATIONS & SOLUTIONS BUSINESS UNIT SYSTEMS & ENGINEERING

01 COMPANY OVERVIEW



WORLDWIDE SERVICE



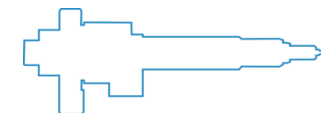
Turnover
70 Mio. Euro



Annual growth rate
10 – 15 %



Employees
370 worldwide



Sold dispensers
> 100.000

ViscoTec



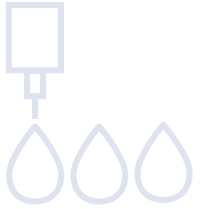
VISCOTEC AT A GLANCE



[ViscoTec Precision Dispensing: Die perfekte Dosis durch Genauigkeit, Zuverlässigkeit und Sicherheit - YouTube](#)



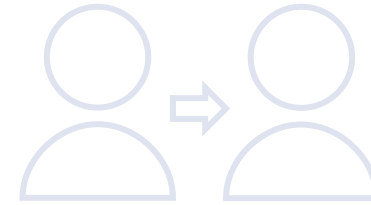
VISCOTEC – CUSTOMER & INNOVATION CENTER



Dosing tests carried out at
the ViscoTec
Technical Lab



Technically qualified
employees



Straightfoward
communication -
one contact person





02

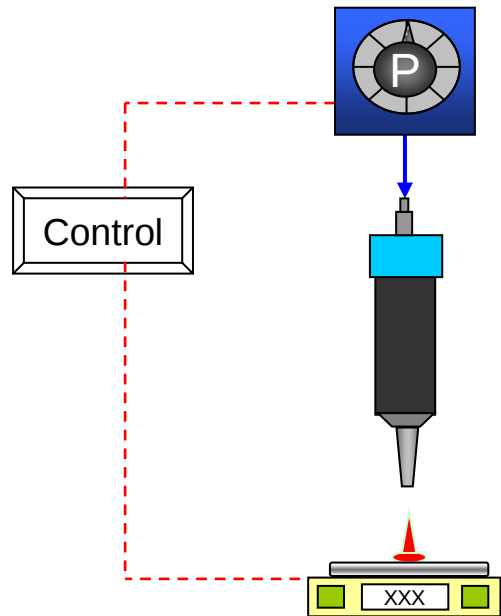
TECHNOLOGY





DOSING PRINCIPLES

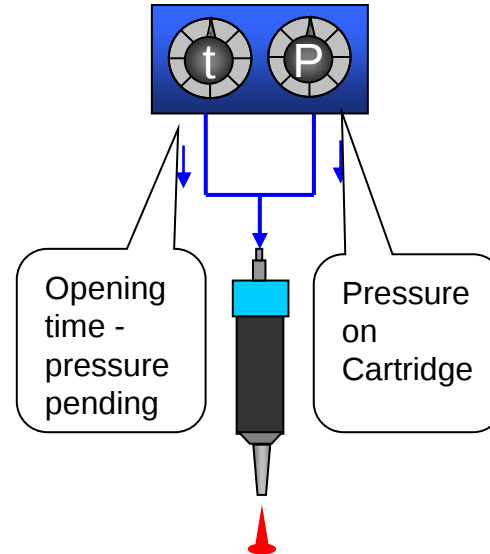
Gravimetric dosing



Operating principle:

- Control of the weight to be dosed via a scale
- Speed control to increase accuracy possible via fine flow outputs

Pressure-time dosing

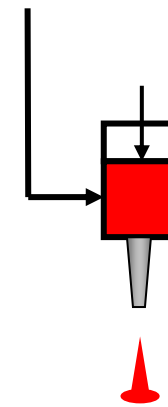


Operating principle:

- Adhesive is pressurized with a defined pressure in a defined time
- flows out of the nozzle

Volumetric dosing

ml or cm³
per stroke



ml or cm³
Per revolution



Operating principle:

- Dosing quantity is applied via a defined volume
- using pistons, chamber valves or positive displacement pumps



TECHNOLOGY

The endless piston principle is the foundation of our success. It offers enormous potential for new applications.

We are passionate and eager to push the boundaries of our technology and are never satisfied with the status quo.





FUNCTIONALITY OF THE ENDLESS PISTON PRINCIPLE

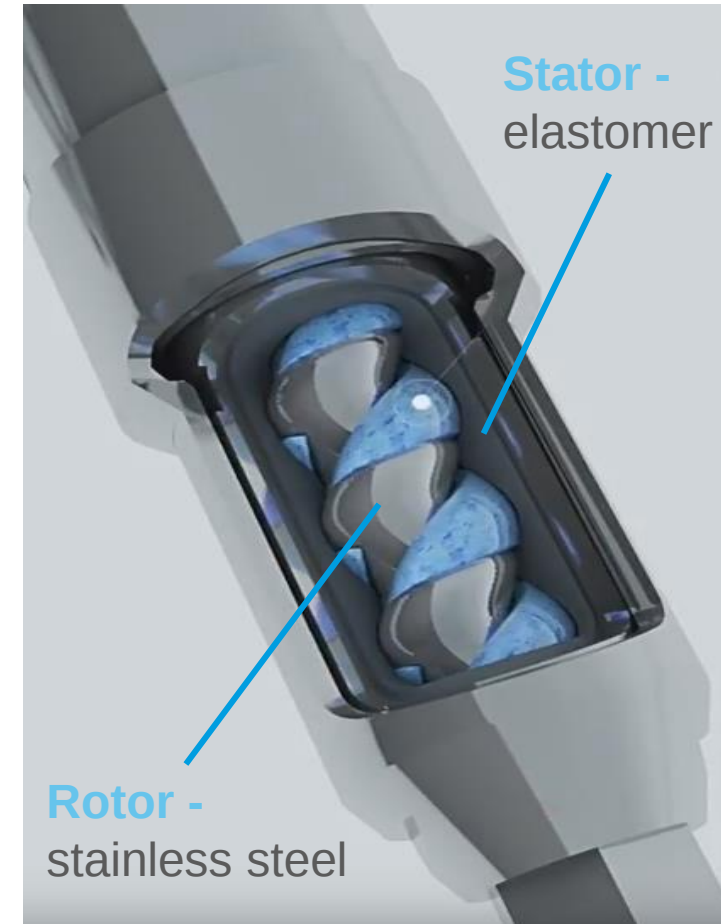
ENDLESS PISTON PRINCIPLE

A progressive cavity pump is a positive displacement pump that uses a rotor and stator assembly to create temporary chambers with a specific volume.

Due to the self-sealing dispensing geometry, a constant volume proportional to the angle of rotation is always conveyed per revolution.

As long as material is present in the inlet, so long you can dispense.

We call it the endless piston principle.





PROGRESSIVE CAVITY PUMP

Advantages

- Self-sealing system
- Continuous volumetric dosing
- Pulsation-free
- High precision
- Linear correlation of rotor speed and output
- Low shearing of fluid
- Ideally suited for abrasive or chemical aggressive materials



[Die vipro-PUMP Serie: Eine neue Ära des hochpräzisen Dosierens - YouTube](#)



PROGRESSIVE CAVITY PUMP

PRO

- Pulsation-free dispensing
- Low shear dosing
- Reversible conveying direction
- No valves necessary, tight system
- Due to volumetric conveying: 99% repeatability
- Suitable for abrasive media with high filler content
- Suitable for shear sensitive media
- Very easy handling (only parameter = speed!)
- Ideal for use in automated processes!



CONTRA

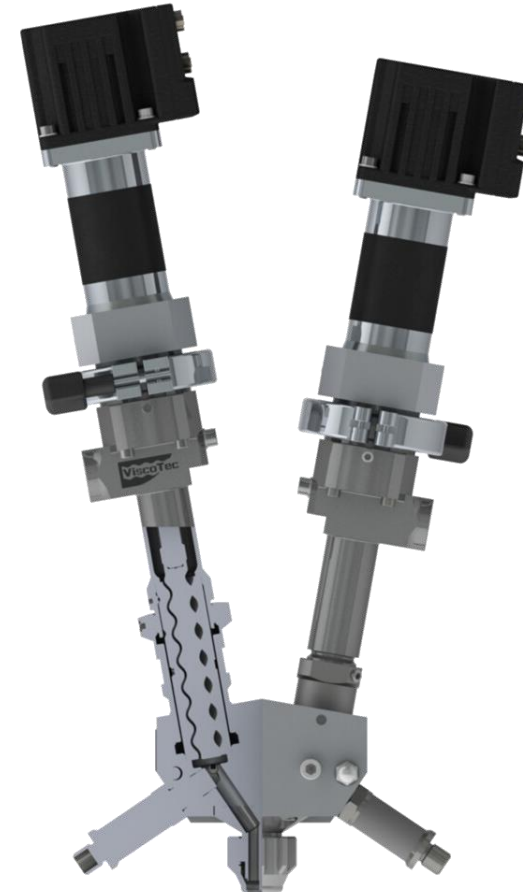
- High sensitivity to dry running
- Relatively low pressures (compared to piston pumps)
- Relatively low metering speed



TECHNOLOGY – 2C DISPENSER

2C Mixing system

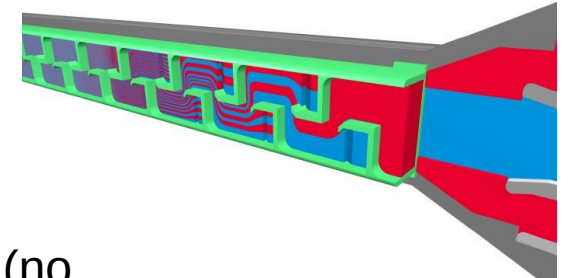
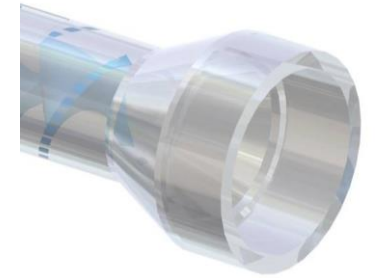
- Combination of two dispenser
- Strict adherence of mixing ratio
- Different mixing ratios by adjustment of dispenser speed and size
- Mixing of both components in static mixer
- Pressure monitoring for process control
- [Video-Link](https://www.youtube.com/watch?v=MORKu8g4rxc)
(<https://www.youtube.com/watch?v=MORKu8g4rxc>)





STATIC MIXING PRINCIPLE

- Operation:
 - Based on the flow dynamics of the flowing mixing components → "Flow mixer"
 - Allow a continuous mixing process
 - Static mixers are construction elements consisting of specially shaped, rigid rows of mixing elements in tubular bodies.
- Benefits:
 - Simple assembly
 - No rinsing agent required
 - At the end of production, the mixing tube and its contents are disposed of (no hazardous waste)
- Limits:
 - For very high differences in viscosity or mixing ratio



Bildquelle: Sulzer Mixpac AG

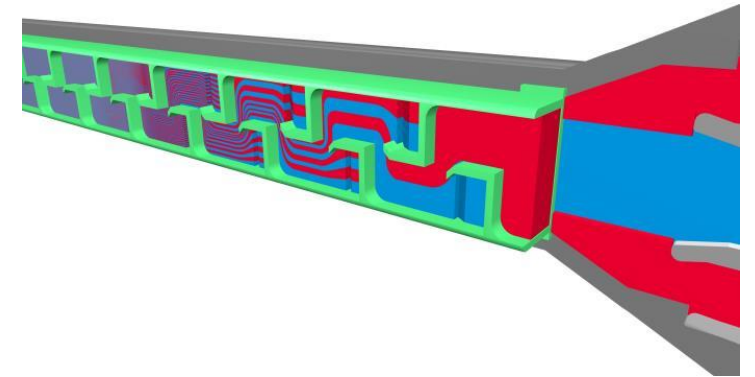




STATIC MIXING PRINCIPLE

When flowing through the static mixing tube, layers are created which lead to mixing of the components.

These layers are defined below in the purely laminar flow range:



Schichtenbildung

Anzahl der Wendel

1

2

3

4

5



Anzahl der Schichten

2

4

8

16

32

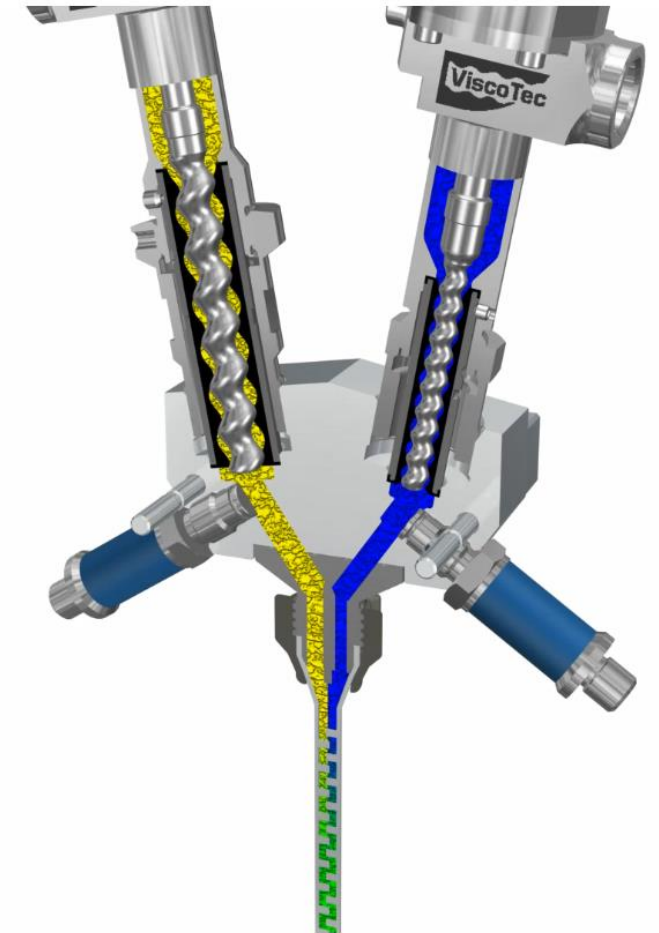
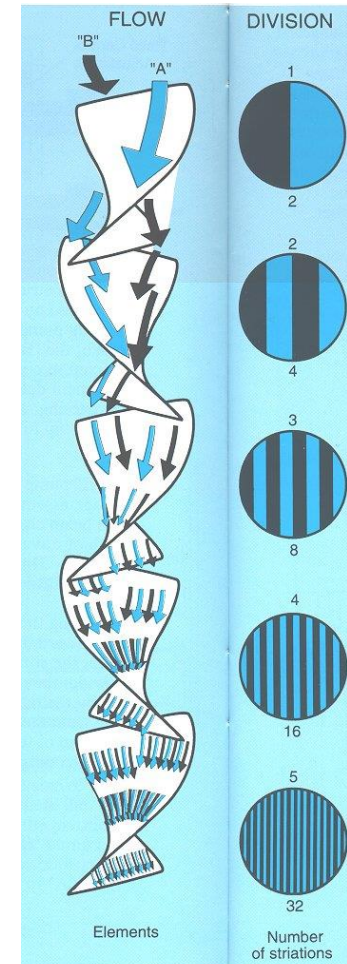
Bildquelle: Sulzer Mixpac AG





STATIC MIXING PRINCIPLE

- Due to the design of the mixing tube helix, layers are created during the flow, which lead to the mixing of the components
- As the number of mixing elements increases, so does the number of layers and therefore the quality of mixing
- The suitable selection of the mixing tube therefore directly influences the degree of mixing
- Sufficient mixing must be tested and checked beforehand for each adhesive and process





TECHNOLOGY – 2C STATIC-DYNAMIC DISPENSER

2C STATIC-DYNAMIC MIXING SYSTEM

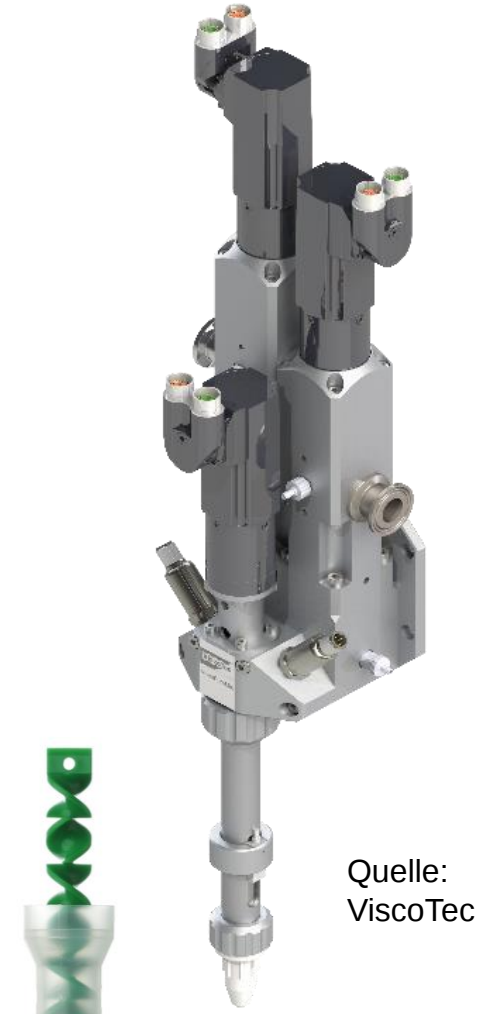
- Identical dispensing principle as in proven static mixing system
- Rotation of helix mixing elements up to 720rpm to improve mixing quality
- Optimized for:
 - For big difference in viscosities
 - Extreme mixing ratios 100:5 (vol)
 - Pressure sensitive and compressible materials





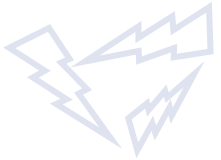
STATIC DYNAMIC MIXING PRINIPLE

- Operation
 - Components A and B are precisely dosed into the mixing tube in a defined mixing ratio and applied with a variably adjustable dosing rate
 - The components are mixed due to the flow through the static-dynamic mixing tube with simultaneous rotation of the spiral
- Benefits:
 - No rinsing agent required
 - Variable adjustment of dosing capacity and speed of the mixing spiral
 - At the end of production, the mixing tube and its contents are disposed of (no hazardous waste)
- Limits:
 - For very high viscosities and flow limits of the individual components





SUMMARY



Ideally suited for
abrasive material



Dispensing and filling
pulsation-free



Guaranteed
precision dispensing



Processing of various pastes
and viscous fluids -
independent of viscosity



Linearity between volume and
speed for variable
robot speed



Reproducible dosing results -
99 % repeatability



03

PRODUCTS & INDUSTRIES

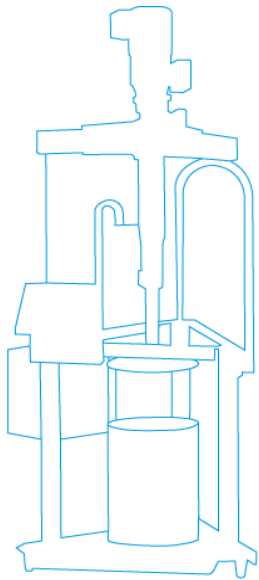




PRODUCTS - MODULAR SYSTEMS

We adapt our system individually to the process and offer additional engineering and consulting.

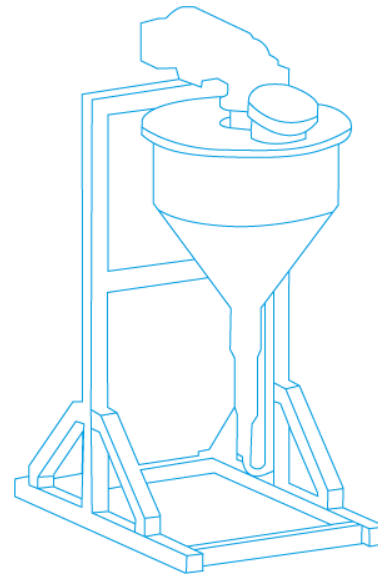
Emptying Systems



- Cartridge
- Hobcock
- Pail / Barrel



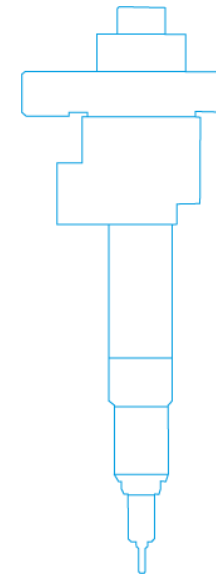
Preparation Systems



- Degassing
- Buffering
- Homogenization



Dosing Systems 1C & 2C



- Any mixture
- From μl to liters
- 99 % accuracy



EMPTYING SYSTEMS

Applications

- Cartridge emptying (pneumatical & mechanical)
- Pail emptying
- Barrel emptying





PREPARATION SYSTEMS

Applications

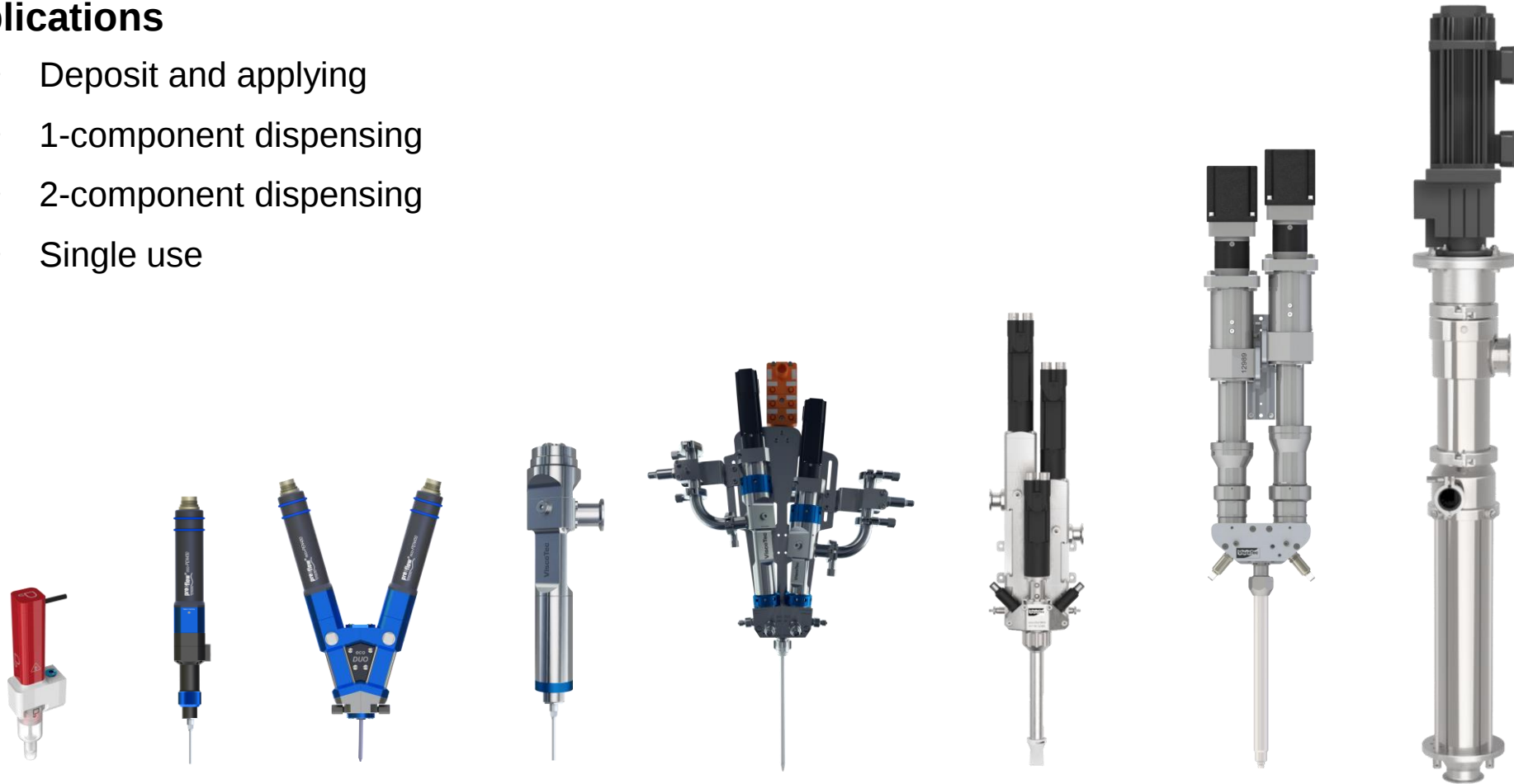
- Preparation
- Degassing
- Product supply



DISPENSER, DOSING AND FILLING PUMPS

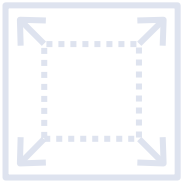
Applications

- Deposit and applying
- 1-component dispensing
- 2-component dispensing
- Single use





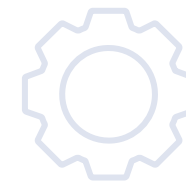
SUMMARY



Dosing volume
0.012 ml/U - 830 ml/U



Volume flow
0.12ml/min - approx. 100 l/min



Smallest dosing quantities
0.001 ml



Mixing ratio
1:1 to 100:2



Reproducible dosing results -
99 % repeatability

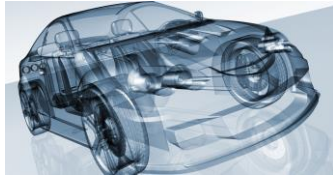


Viscosities up to
7,000,000 mPas



INDUSTRIES

Automotive



Electronics



Medical technology



Pharma



E-Mobility



General Industry



Food



Dental



3D printing



Aerospace



Cosmetics



Consumer Goods





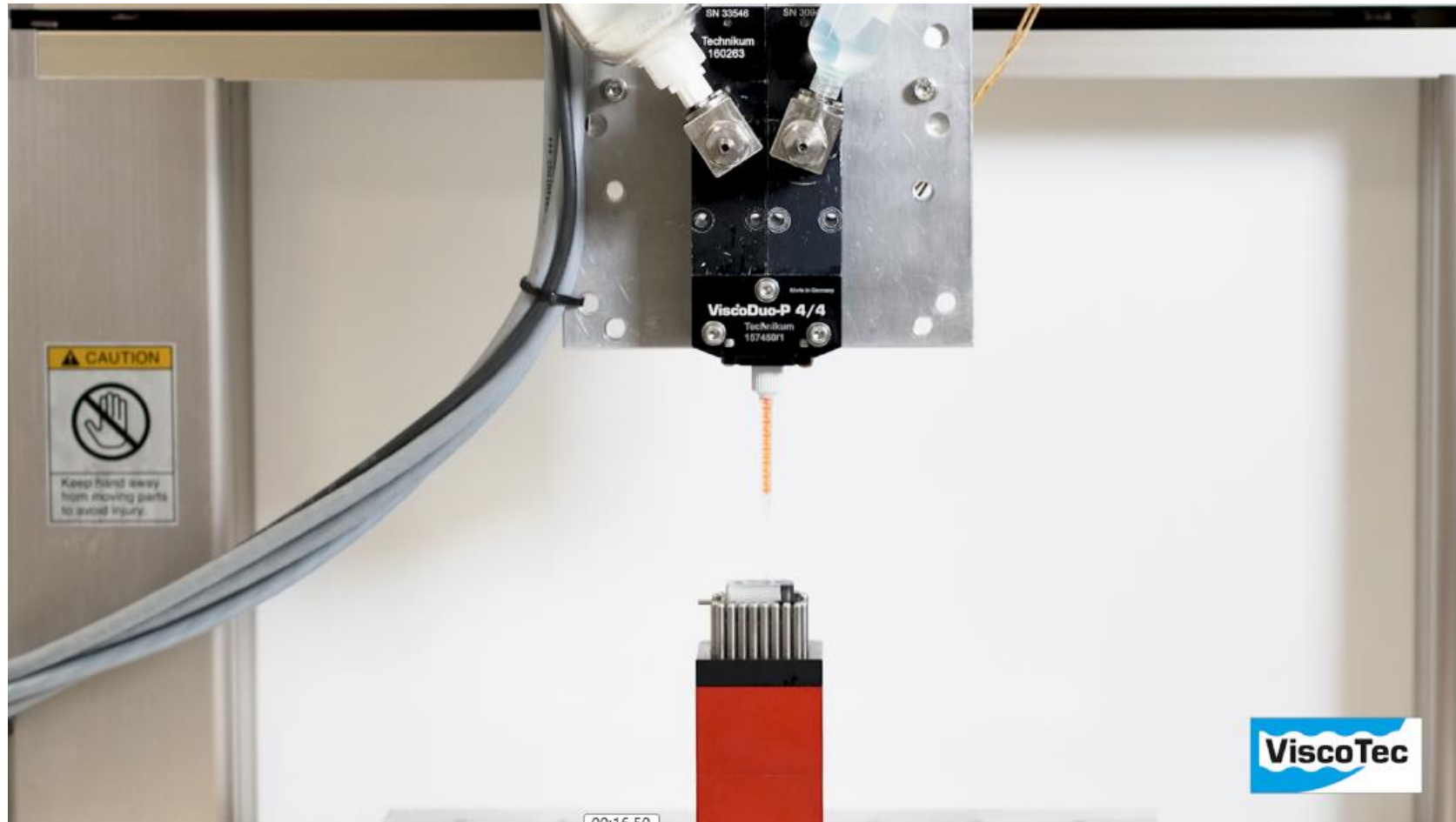
04

APPLICATIONS & SOLUTIONS BUSINESS UNIT SYSTEMS ENGINEERING



BONDING

2-COMPONENTEN ADHESIVE BONDING



[Potting of 2-Component Adhesive on Small Electric Motor - YouTube](#)

2-COMPONENT OPTICAL BONDING



[Display Production: Optical Bonding with 2-Component Material WACKER SilGel613 \(youtube.com\)](#)



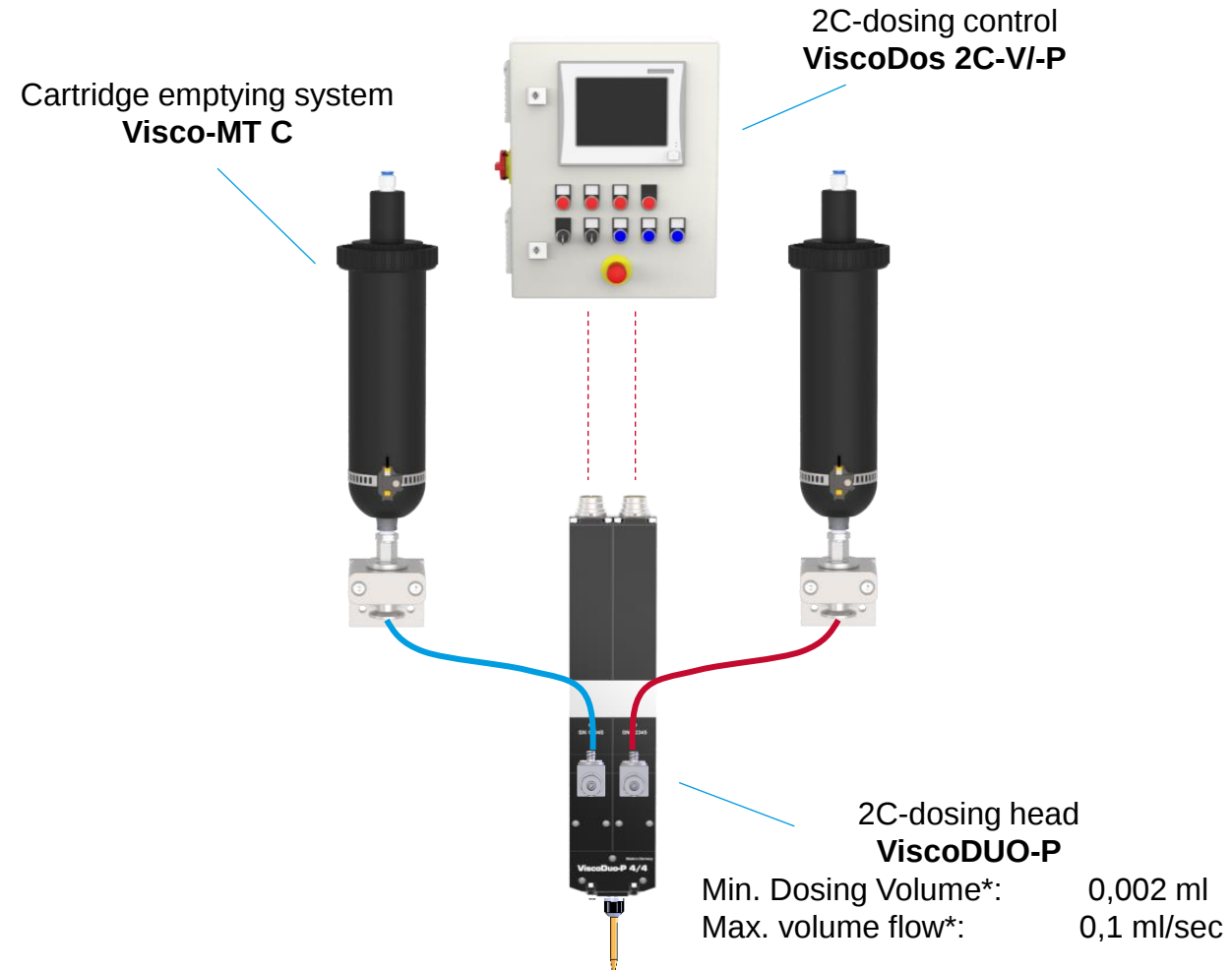
BONDING – EXAMPLE LAYOUT

Application

Dispensing of small quantity 2-componente adhesive

Advantages of ViscoTec dosing technology

- Removal of different types of cartridges e.g. 180 - 310 - 600 - 950 ml cartridges
- no curing in the dispenser thanks to the self-sealing principle of the progressive cavity pump
- Pulsation-free and continuous dispensing
- Repeatable dispensing of low to high viscous adhesives
- Two component materials can be dispensed without any problems, even in extreme mixing ratios.



*Depends on material, viscosity and primary pressure



BONDING ANAEROBIC ADHESIVE - EXAMPLE

LOCTITE

Technical Data Sheet

LOCTITE® AA 326™
Bekannt als LOCTITE® 326
Dezember 2013

PRODUKTBESCHREIBUNG
LOCTITE® AA 326™ besitzt die folgenden Produkteigenschaften:

Technologie	Acrylat
Chemische Basis	Polyurethanmethacrylat
Aussehen (unausgehärtet)	Transparent, gelb bis hell bernsteinfarben, flüssig ^{MS}
Komponenten	Einkomponentig - kein Mischen erforderlich
Viskosität	Hoch
Aushärtung	Anaerob, mit Aktivator
Vorteil dieser Aushärtung	Härtet bei Raumtemperatur
Anwendung	Kleben

Typische Anwendungen für LOCTITE® AA 326™ sind u.a. das Kleben von Ferriten auf plattierte Elektromotorteile, das Kleben von Lautsprecher-Hardware und von Schmuckstücken, wenn schnelles Fixieren gefordert ist.

MATERIALEIGENSCHAFTEN

Spez. Dichte bei 25 °C	1,1
Flammpunkt - siehe Sicherheitsdatenblatt	
Viskosität, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindel 6, bei 20 U/min	14.000 bis 22.000 ^{MS}
Viskosität, EN 12092 - MV, 25 °C, nach 180 s, mPa·s (cP):	
Schergeschwindigkeit 36 s ⁻¹	10.000 bis 20.000

Aushärtengeschwindigkeit in Abhängigkeit vom Spalt
Die Aushärtengeschwindigkeit ist abhängig vom Klebespalt. Das folgende Diagramm zeigt die zeitliche Entwicklung der Scherfestigkeit auf sandgestrahlten Zugversuchsproben aus Stahl bei unterschiedlichen Spalten. Geprüft gemäß ISO 4587. (Auftragung von Aktivator 7649 auf eine Oberfläche)

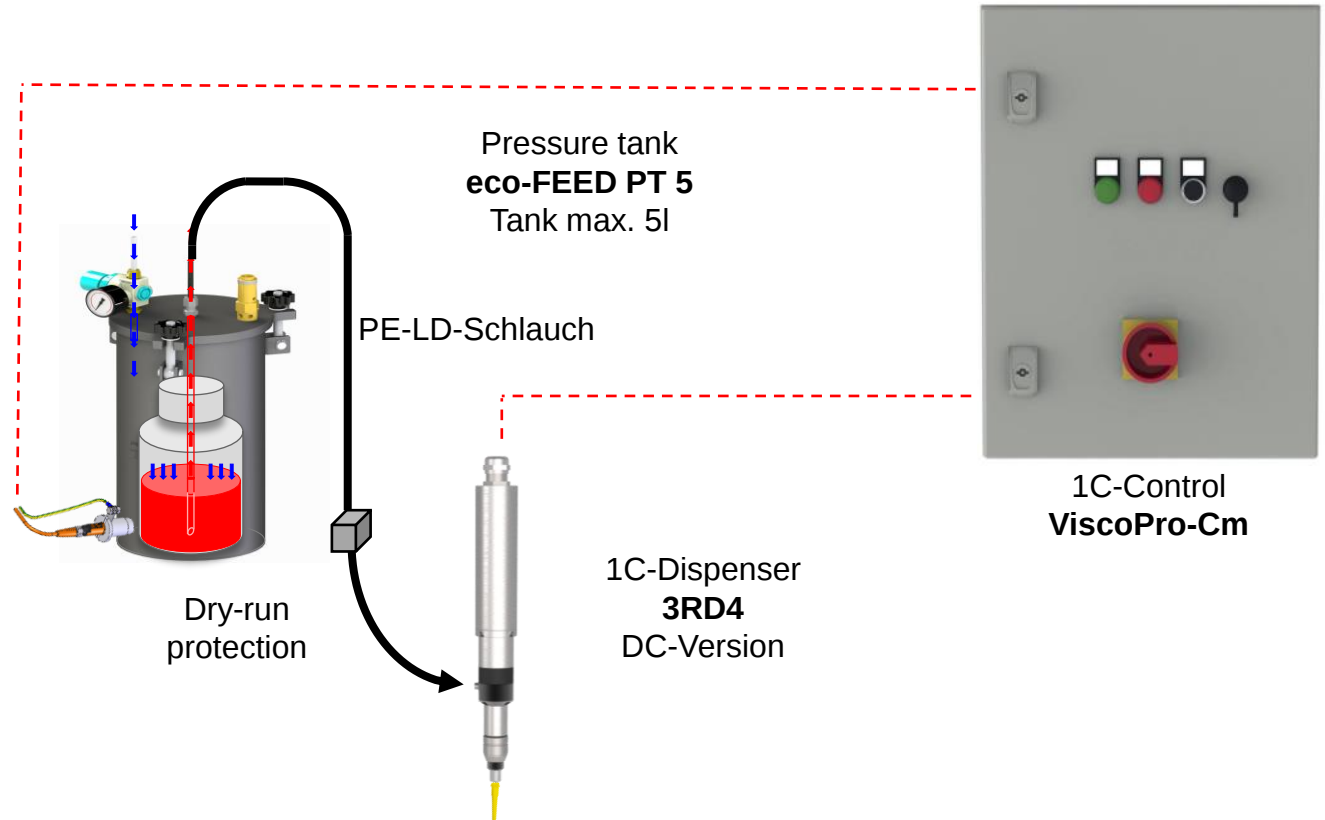
Aushärtengeschwindigkeit in Abhängigkeit von Zeit und Temperatur
Die Aushärtengeschwindigkeit ist abhängig von der Umgebungstemperatur. Das folgende Diagramm zeigt die zeitliche Entwicklung der Scherfestigkeit auf sandgestrahlten Zugversuchsproben aus Stahl bei 120 °C. Geprüft gemäß ISO 4587

Dispensing time:

15 sec

Quantity:

0,12 ml

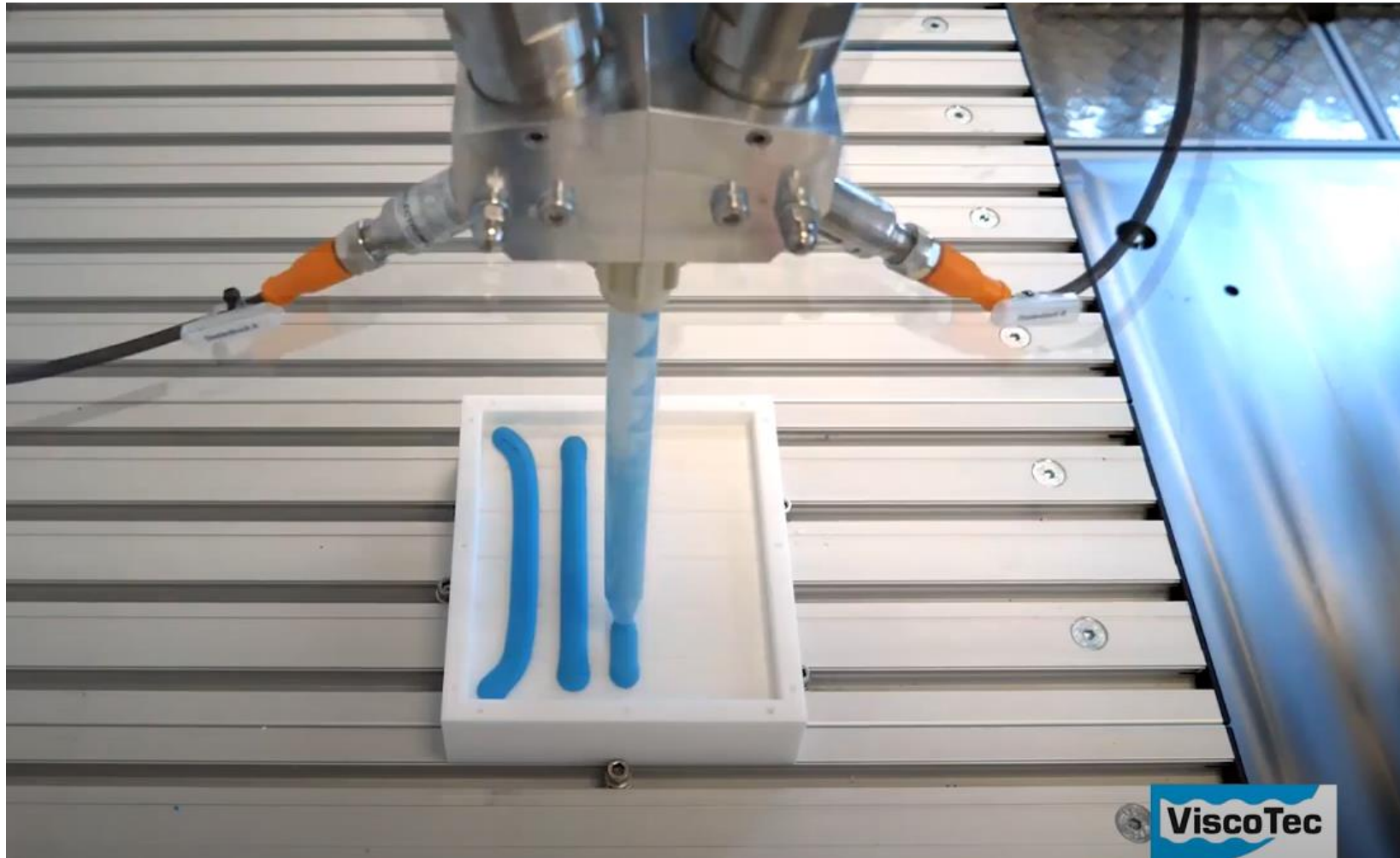


Bei dem im Projektlayout dargestellten System handelt es sich um eine Skizze (nicht maßstabsgetreu). Die endgültige technische Auslegung kann abweichen.

ViscoTec Pumpen- u. Dosiertechnik, Klebstoffseminar Bodo Möller, 16.05.2024

▮ THERMAL MANAGEMENT

➤ GAP FILLERS / THERMALLY CONDUCTIVE PASTES



[ViscoTec im Bereich E-Mobility: Dosieren von 2K Gap Fillern in Batteriemodule - YouTube](#)



THERMAL MANAGEMENT

VISCOTEC SOLUTION: CERAMIC & CARBIDE ROTOR

Challenge

Highly abrasive fillers like in thermal interface materials or gap fillers wear out the dispensing equipment quickly.

Solution

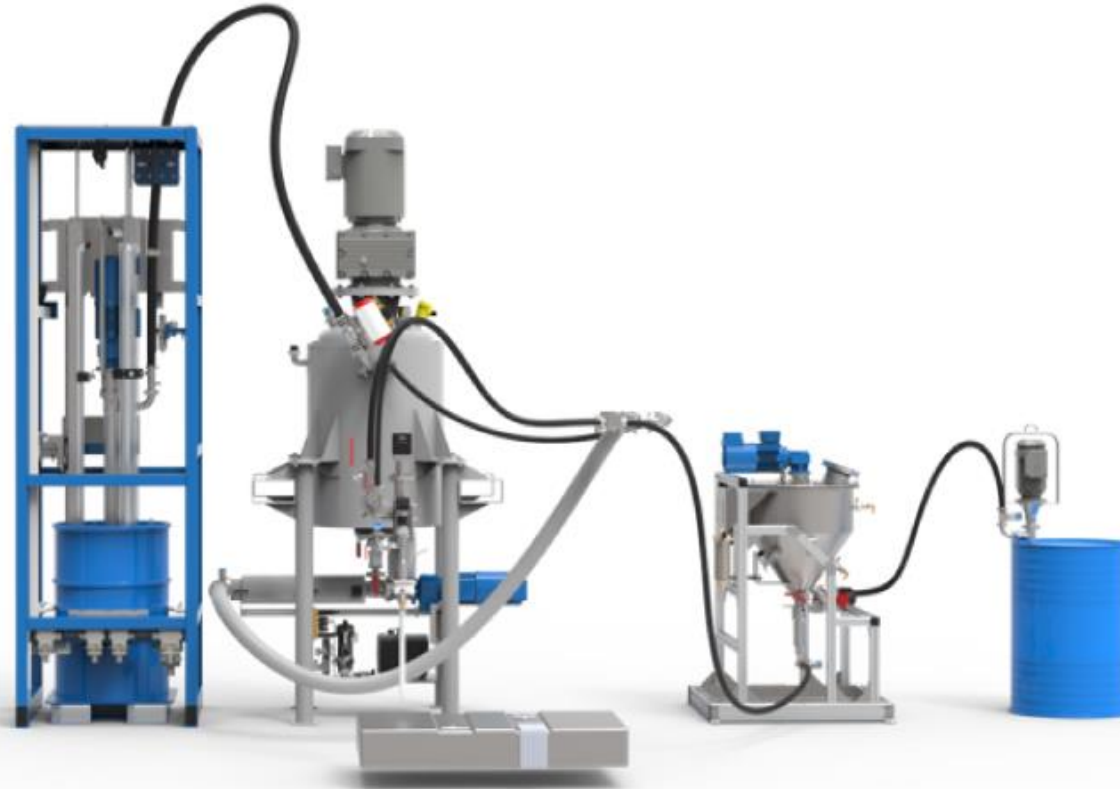
Carbide or Ceramic rotor is characterized by a significantly higher resistance compared to standard rotors

- Increase of lifetime up to a factor of 3-6 depending on material
- Longer lifetime of elastomeric stator
- An upgrade to the existing dosing system is possible without any problems





THERMAL MANAGEMENT - SAMPLE DISPENSING SYSTEM LAYOUT FOR HIGH PRODUCTION VOLUME



[2-component dispensing system for gap filler applications in E-Mobility \(youtube.com\)](#)

SEALING



SEALING

Application

Applying sealants for sealing e.g. battery systems and Control Units

Advantages of ViscoTec dosing technology

- Decades of experience in nearly all industries
- Difficult profiles and contours can be dispensed safely and reliably thanks to the direct proportionality between drive speed and output quantity
- Pulsation-free and continuous dispensing
- Repeatable dispensing of high viscous sealing materials
- 2C materials can be dispensed without any problems, even in extreme mixing ratios.



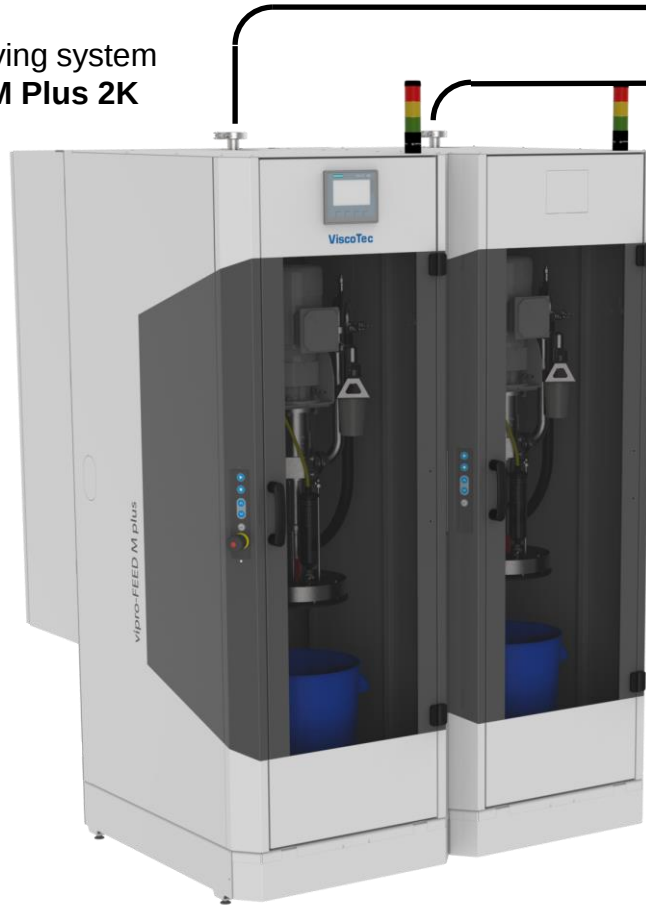
[Inverter Sealing – YouTube](#)



SEALING

SAMPLE DISPENSING SYSTEM LAYOUT

Hobcock emptying system
vipro-FEED M Plus 2K



2C-dosing control
vipro-CONTROL 2C
Siemens base



2C-dosing head
vipro-DUO 500/500



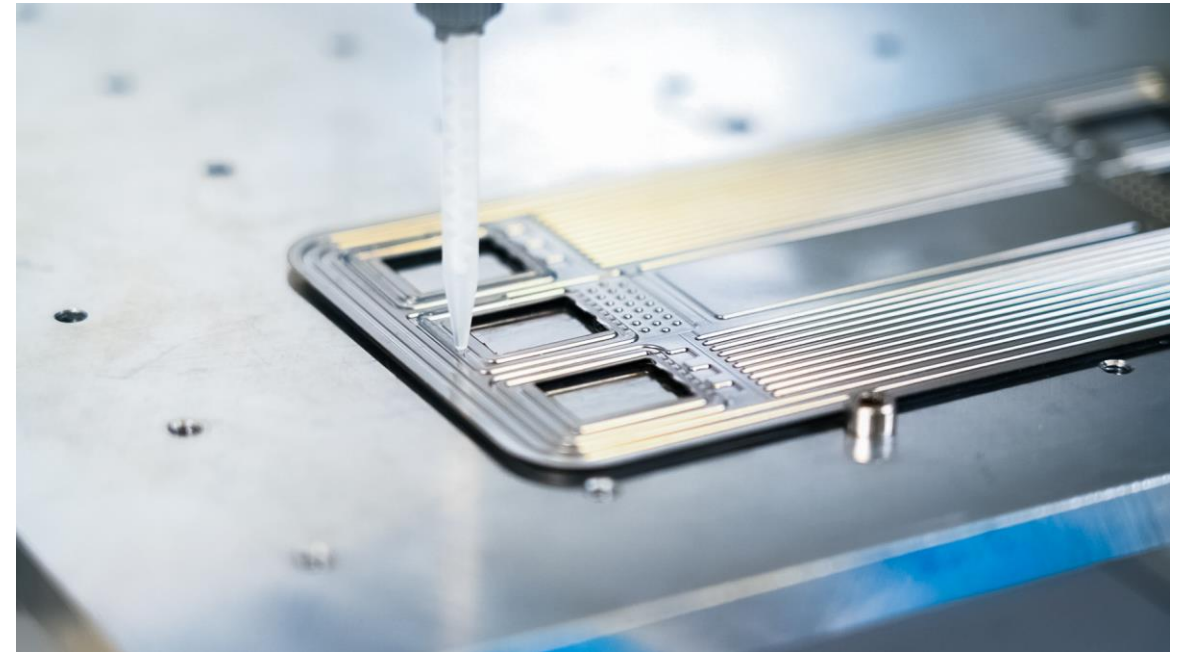
SEALING ON BIPOLAR PLATE

Application

Surrounding sealing gasket on the bipolar plate

Advantages of ViscoTec dosing technology

- Consistent bead thickness
- Precise and repeatable process
- Even sealing bead even at complex contours
- Scalability
- Flexible regard design changings

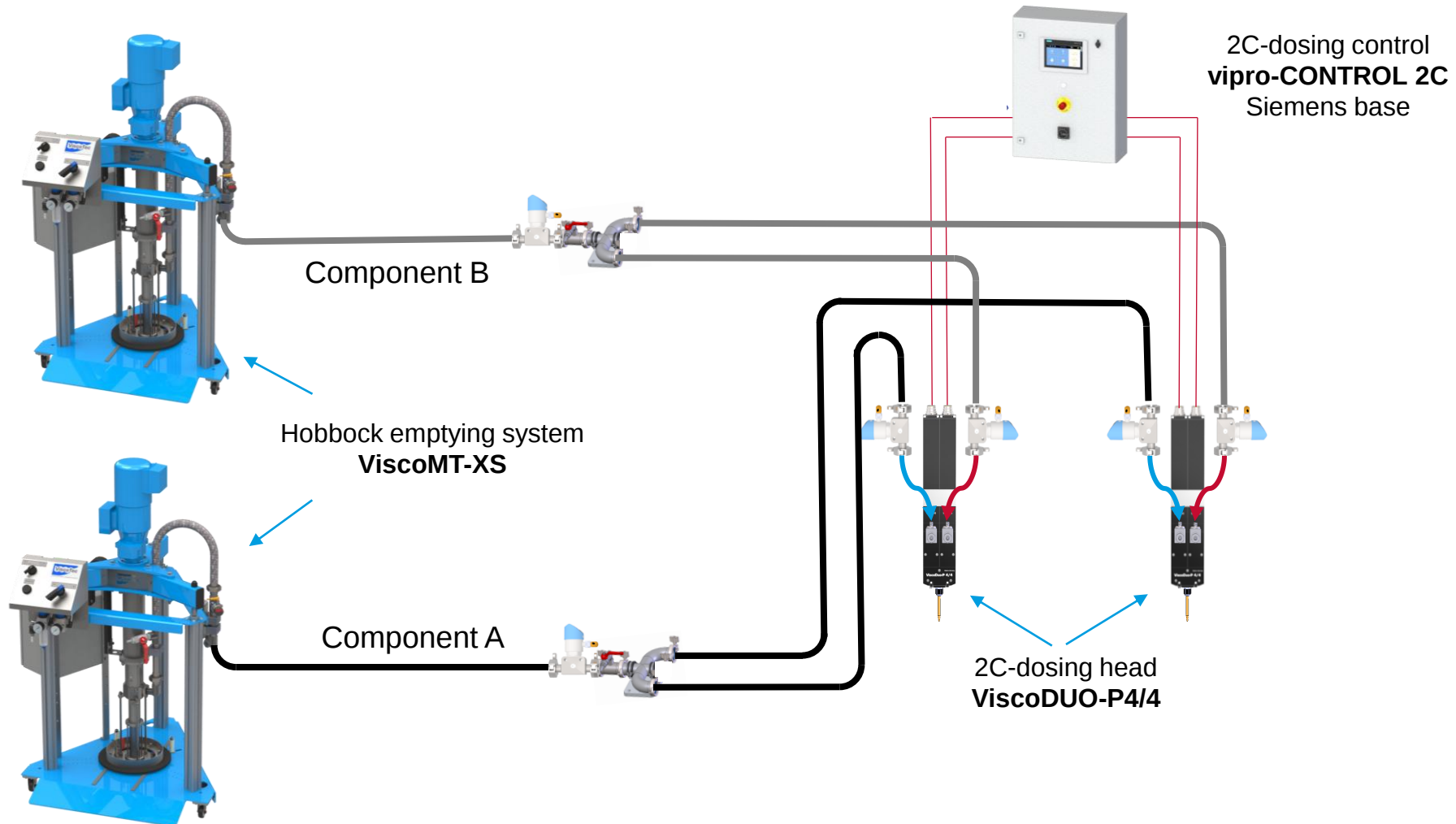


[Versiegelung von Bipolarplatten für Brennstoffzellen - YouTube](#)



SEALING ON BIPOLAR PLATE

SAMPLE DISPENSING SYSTEM LAYOUT



▮ POTTING



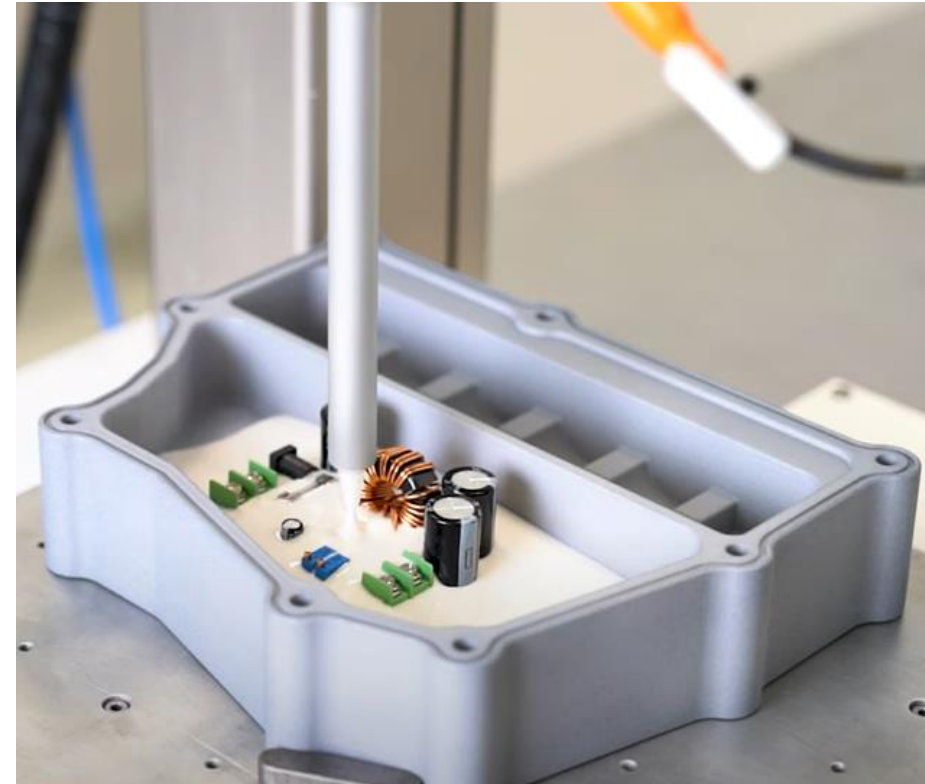
POTTING

Application

Potting of electric components e.g. control units with one- or two-component materials.

Advantages of ViscoTec dosing technology

- Precise and repeatable potting of one or two component materials
- Adjustable mixing ratio and thus more flexibility in case of potential materials changes (e.g. if the hardness is adjusted by varying the mixing ratio)
- No dripping due to adjustable suck-back
- Bubble-free potting through evacuated material

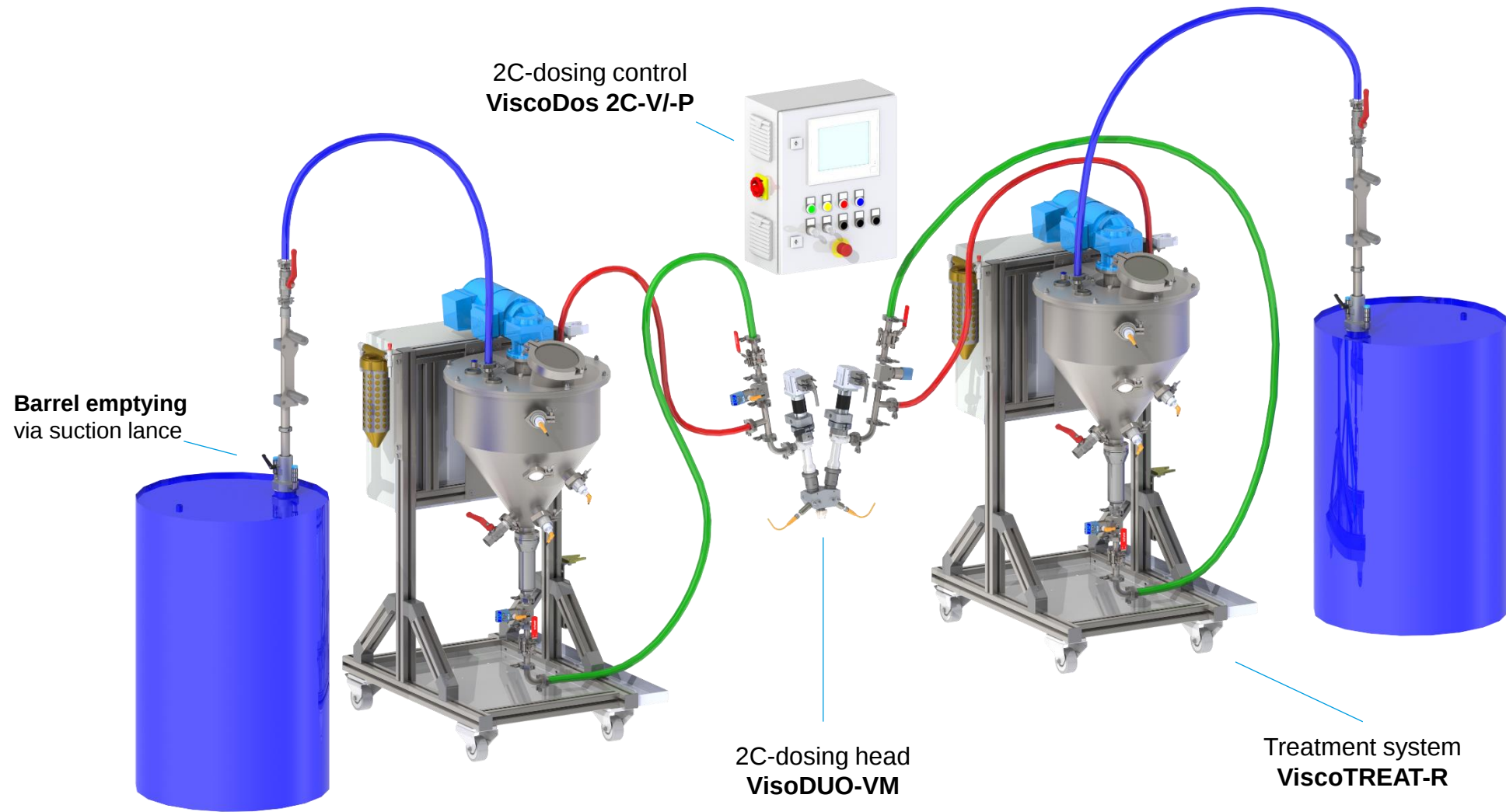


[Dispensing-Anwendungen für die Leistungselektronik: Wechselrichter-Produktion - YouTube](#)



POTTING

SAMPLE DISPENSING SYSTEM LAYOUT



TRICKLING



RESIN IMPREGNATION - TRICKLING

Application

Trickling of resins on rotor- and stator windings

Advantages of ViscoTec dosing technology

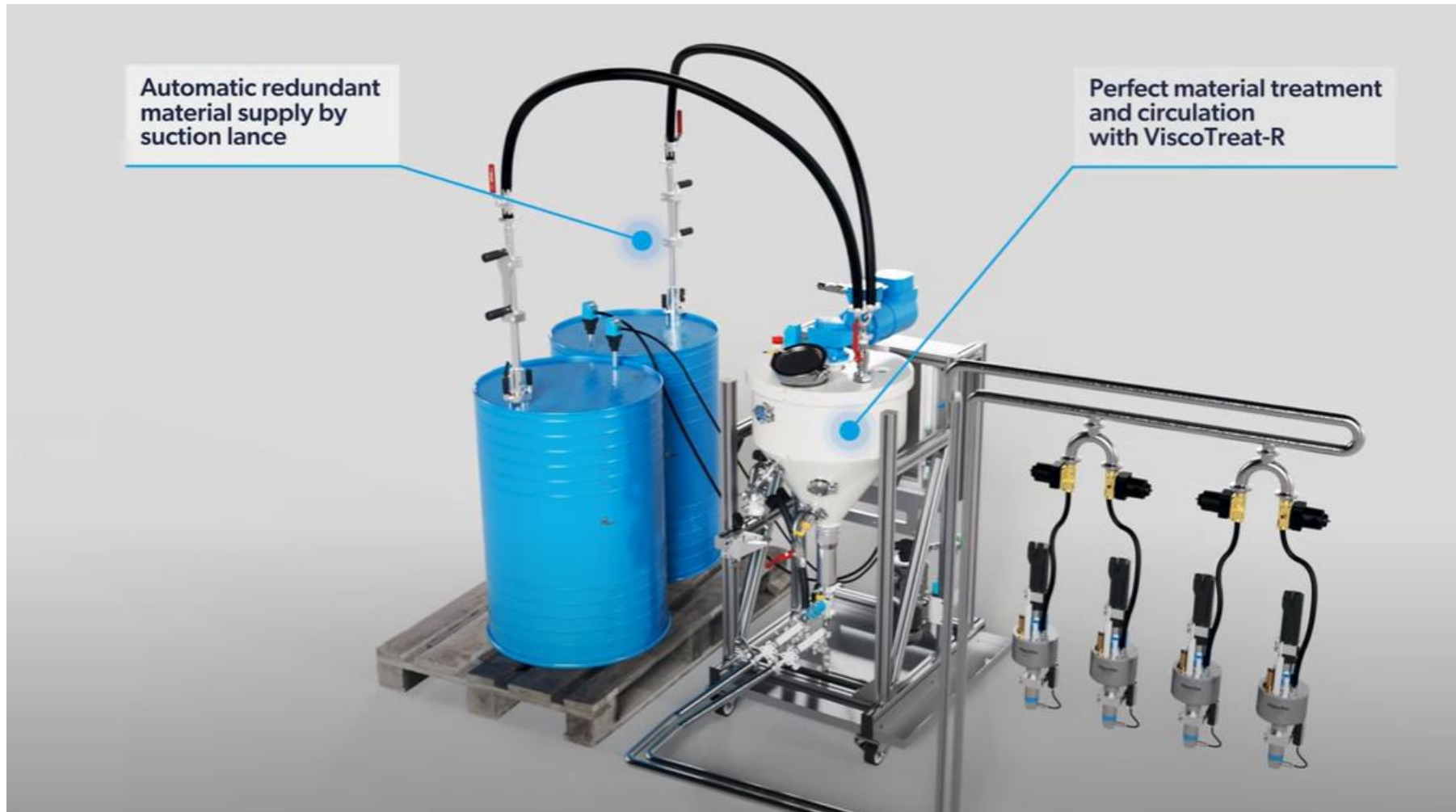
- Ensuring a precisely controlled material flow even for low viscous two component materials
- Easy adjustability, due to the direct proportionality between drive speed and discharge quantity
- Dripping can be avoided by the reverse movement of the dispenser
- Continuous dosing without pulsation guaranteed by the endless piston principle
- Air bubble free material by evacuating
- No valves in complete system



[ViscoTec Trickling System: Resin Impregnation of Rotor & Stator with Dolphon 1180 HTC from von Roll - YouTube](#)



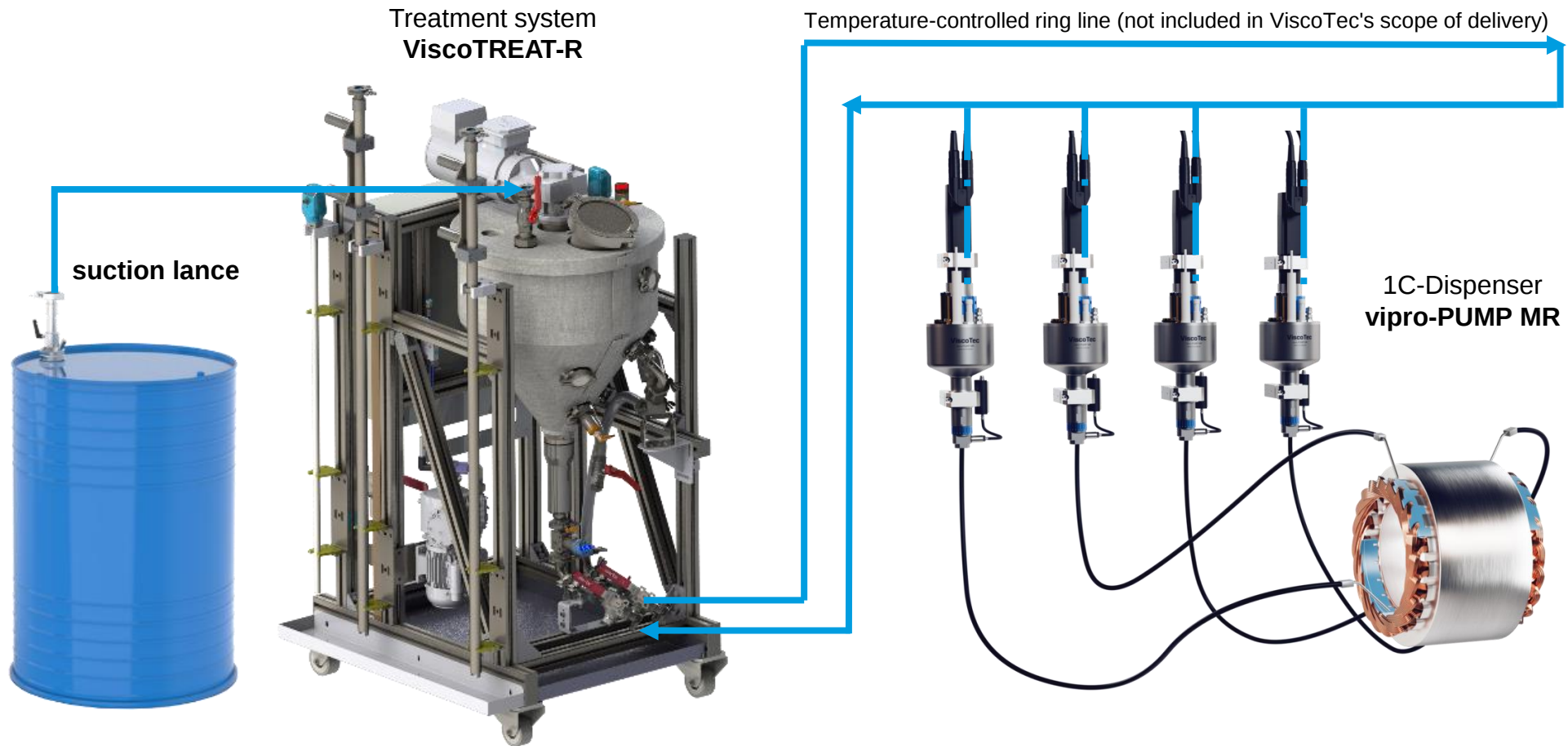
RESIN IMPREGNATION SAMPLE DISPENSING SYSTEM LAYOUT



[Herstellung von Elektromotoren: Harz-Imprägnierung mit vipro-PUMP MR \(youtube.com\)](https://www.youtube.com/watch?v=...)



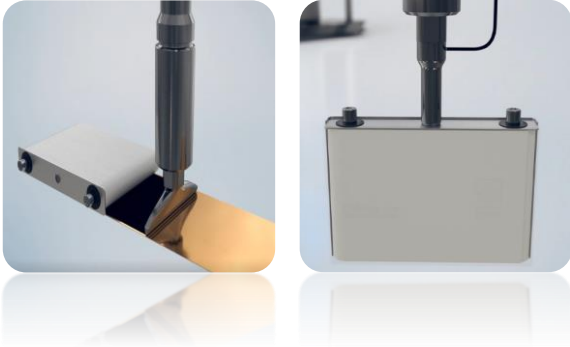
RESIN IMPREGNATION SAMPLE DISPENSING SYSTEM LAYOUT



▮ E-MOBILITY

➤ APPLICATIONS IN E-MOBILITY

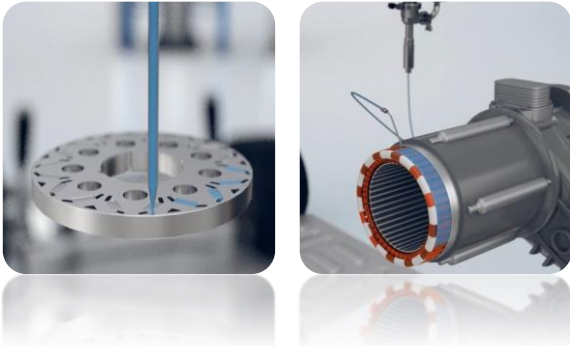
Battery Cell Manufacturing



Battery Module & Battery Pack Assembly



E-Drive Manufacturing



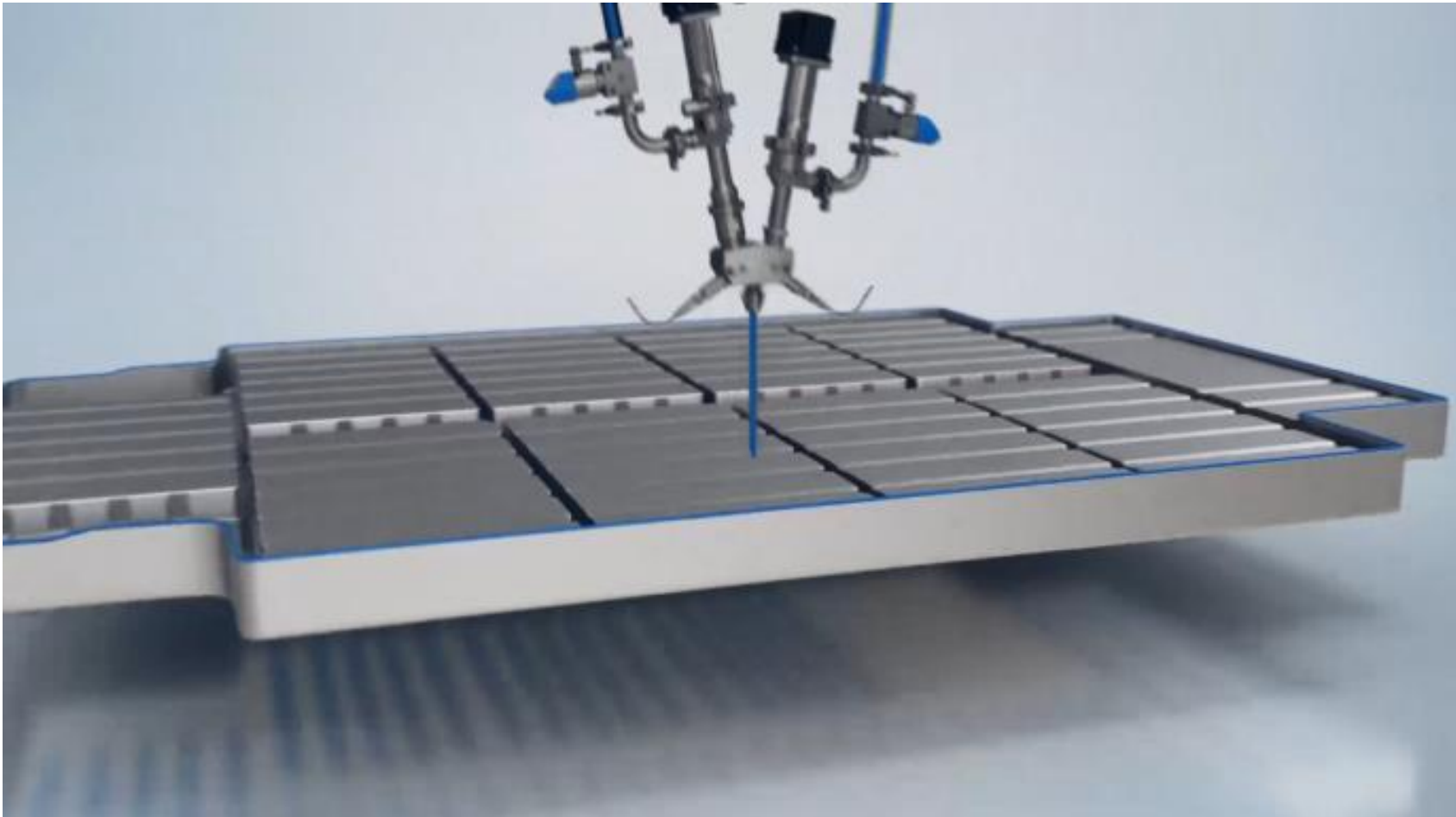
Power Electronics



Fuel Cell



➤ APPLICATIONS IN THE E-MOBILITY INDUSTRY

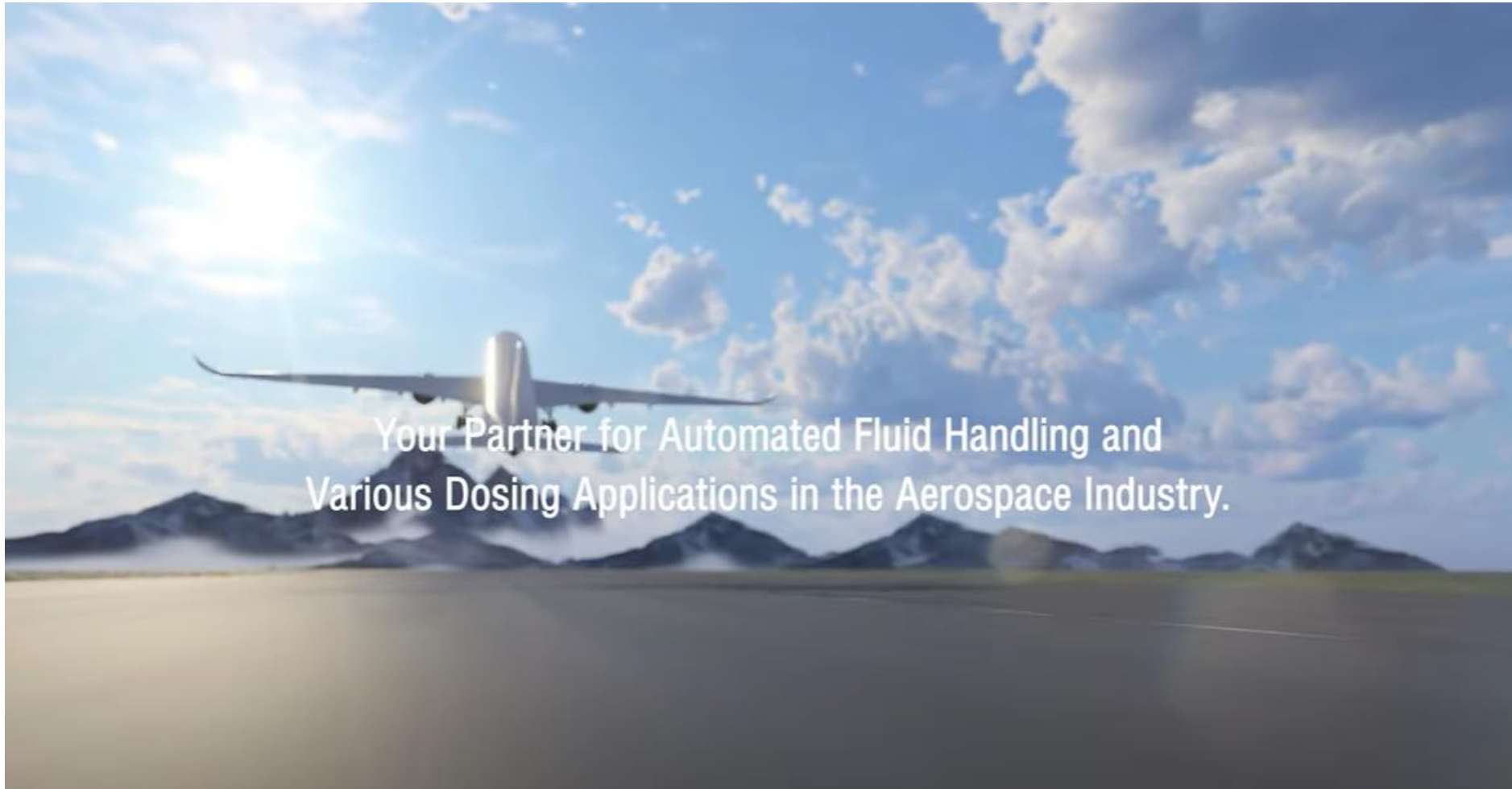


[Dosierlösungen für die Produktion in der E-Mobilität - YouTube](#)

▮ AEROSPACE



APPLICATIONS IN THE AEROSPACE INDUSTRY



[ViscoTec Dosieranwendungen für die Luft- und Raumfahrtindustrie \(youtube.com\)](https://www.youtube.com/watch?v=...)



VISCOTEC PUMPEN- U. DOSIERTECHNIK GMBH

Address: Amperstraße 13
84513 Töging a. Inn
Phone: +49 8631 9274 0
E-Mail: mail@viscotec.de
Web: www.viscotec.de

YOUR CONTACT PERSON

Mr. Matthias Oberhofer
Team Lead Technical Sales DACH

Tel.: +49 8631 9274-432
Mobil: +49 172 1066120
E-Mail: matthias.oberhofer@viscotec.de

