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1 Introduction

The Dosing Unit SP-50 is a volumetric dosing device which allows highly accurate dosing controlled via the local touchscreen of your synthesis workstation (EasyMax® or OptiMax™) or via the PC software iControl™. The DU SP-50 does not need a power cable when connecting to the synthesis workstation. The communication and also the power supply are done via a CAN connection cable.

- Four different syringe volumes (from 1 mL up to 50 mL) can be used.
- A simple Plug & Play behavior makes it easy to install and set up the Dosing Unit.
- One Dosing Unit can be used to dose into the reactor of OptiMax™.
- One Dosing Unit can be used to dose into both reactors of an EasyMax® at the same time.

We, Mettler-Toledo AG, accept no liability whatsoever if you do not observe the following rules and measures for safe operation of the Dosing Unit SP-50.
2 Safety Measures

The Dosing Unit SP-50 has been tested for the experiments and intended purposes documented in these Operating Instructions. However, this does not absolve you from the responsibility of performing your own tests of the product supplied by us regarding its suitability for the methods and purposes you intend to use it for. You should therefore observe the following safety measures.

2.1 Measures for your Protection

Power failure

- Implement appropriate measures against possibly fatal consequences of a power failure!

Risk of explosion

Potentially explosive environment

- Never work in an environment subject to explosion hazards! The housing of the Dosing Unit SP-50 is not gas tight (explosion hazard due to spark formation, corrosion caused by ingress of gases).
- Avoid electrostatic charge formation.
- Avoid the disposal of corrosive or potentially explosive gases.

Risk of explosion

Pressure in the dosing system

- The Dosing Unit is not suitable for the use under pressure. Never try to pressurize the dosing system or work with a pressurized dosing system.

Risk of explosion

Tubing

- Check the tubing and the dosing head for leaks and damages prior to each use.

Risk of explosion
2.2 Measures for Operational Safety

Connection of cables
- Do not disconnect a cable while the system is in operation! The printed circuit board of the instrument could otherwise be damaged.

Caution

Service
- Never open the instrument! Have it serviced only by METTLER TOLEDO service.

Caution

General
- Exclude the following environmental influences
  - powerful vibrations,
  - direct sunlight,
  - atmospheric humidity greater than 80 %,
  - temperatures below 15 °C and above 40 °C,
  - powerful electric or magnetic field!

Usage
- It is recommended to operate the Dosing Unit SP-50 only with standard and optional equipment provided by METTLER TOLEDO.

Caution

Liquids
- Make sure you do not dose liquids which can change viscosity during dosing e.g. crystallization or polymerization. This will block the dosing lines / valve and can lead to damage.
- Make sure that you adjust the filling speed with respect to the volatility of the liquid. Filling the syringe with a too high speed can create a vacuum which will cause air bubbles in the system. This can lead to an incomplete filling of the syringe and therefore to wrong dosing amounts.
Filling-/dosing speed

- Make sure that you adjust / reduce the filling/dosing speed when working with higher viscous liquids (viscosity above approx. 3 mPas). Trying to fill the syringe with a too high speed can create a vacuum in the system. This can lead to an incomplete filling of the syringe and therefore wrong dosing amounts. Dosing with high viscosity liquids at high flow rates can cause an overload of the device. Use always the 3.2 mm tubing with these types of solvents.

Accuracy/reproducibility

- Before you perform dosing experiments with "your" liquids make sure that the equipment fulfills your requirements with respect to accuracy and reproducibility. See chapter 8.5.
3 Dosing Unit SP-50 - Front / Rear View

4 Installing Dosing Unit

4.1 Positioning Dosing Unit

The Dosing Unit can be placed either on the right or on the left side of the synthesis workstation, in a way that both housings contact each other. The integrated magnets will establish a connection between both instruments that will avoid accidental sliding of the Dosing Unit.

It is also possible to fix the Dosing Unit to a steel rod using the fastening bar on the back side of the Dosing Unit. The holder can be fixed to the steel rod by tightening the two set screws.

NOTE: Do not carry the synthesis workstation together with any Dosing Units connected. The magnetic connection between the synthesis workstation and a connected Dosing Unit or between different Dosing Units among each other is not strong enough for any kind of transport.
4.2 Connect Dosing Unit to EasyMax® / OptiMax™

The complete communication between the synthesis workstation and the Dosing Unit and also the power supply is handled via the CAN bus. To connect a Dosing Unit to the workstation you only need to connect the CAN bus on the rear side of the workstation with the "CAN IN" connector on the rear side of the Dosing Unit using the provided CAN Bus cable.

Connect the Dosing Unit to the EasyMax® via CAN Bus Cable.

Connect the Dosing Unit to the OptiMax™ via CAN Bus Cable.
5 Number of Dosing Units

Up to 4 Dosing Units can be connected to the EasyMax® or the OptiMax™ via CAN Bus. If more than one Dosing Unit shall be connected, any other Dosing Unit is connected in series. This means a second Dosing Unit is simply connected to the "CAN OUT" connector of the first Dosing Unit.

NOTE: Only one Dosing Unit can be used for pH Control.

6 Dosing Unit LED

The Dosing Unit LED shows the status of the instrument. It is positioned on the bottom right of the front side.

The Dosing Unit LED displays the different status with three colors.

<table>
<thead>
<tr>
<th>Color</th>
<th>Meaning</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>Initialized / Active</td>
<td>Normal status</td>
</tr>
<tr>
<td></td>
<td>GREEN blinking</td>
<td>The device is dosing</td>
</tr>
<tr>
<td></td>
<td>Dosing</td>
<td></td>
</tr>
<tr>
<td>RED</td>
<td>Error</td>
<td>Check the error message on the touchscreen or in iControl Software</td>
</tr>
<tr>
<td>ORANGE</td>
<td>Initialization running</td>
<td>Wait for the process to be finished</td>
</tr>
</tbody>
</table>
7 Installing the Tubing

The assembly of the tubes is done via UNF compression fittings of the dimension 1/4" 28 G and GL14 connectors. The corresponding tubes are made of PTFE and measure 1/8" = 3.2 mm or 1/16" = 1.6 mm outside diameter.

7.1 Assembling a Tube Connection to the Dosing Adapter or the Feed Container

![Threaded Tube Coupling](image)

- First slip the tube through a screw cap with aperture GL14 (1).
- Then mount a UNF 1/4" 28 screw plug (2) and a ferrule for 3.2 mm tubes (3) over the tube. Make sure the ferrule is mounted with the tapered side pointing towards the screw plug (2).
- Behind the ferrule slip an adapter GL14-UNF (4) and a silicone rubber seal GL14 (5) over the tube. In doing so, the PTFE-coated side of the rubber seal has to point away from the adapter.
- Afterwards the screw connection can be fixed on the dosing adapter or on the 2 port distribution cap (see Fig. 3 and Fig. 4).

For the corresponding threaded tube coupling with the thinner tubing (1.6 mm) the blue ferrule (3a) instead of the yellow ferrule (3) and the screw plug (2a) instead of the UNF 1/4" 28 screw plug (2), both with a smaller inner diameter have to be used.

![Threaded Tube Coupling](image)

**2a** UNF 1/4" 28-screw plug for 1/16" (1.6 mm) tubing

**3a** UNF 1/4" 28-ferrule for 1/16" (1.6 mm) tubing
The threaded tube couplings can now be screwed into a dosing adapter (ST14-GL14 or ST19/-GL14) or into the 2 port distribution cap of the feed container:

Fig. 3: screwing the threaded tube coupling onto the dosing adapter

Fig. 4: screwing the threaded tube coupling onto the 2 port distribution cap

**Caution!**

- Observe the minimum allowable bending radius when assembling the tubing. With 1/8" tubing a bend radius of 1/2" (12.7 mm) must not be exceeded.
- If you perform only one dosing procedure at a time using one of the two outputs (Out 1 or Out 2), you should close the other, unused output using one of the provided plugs.
- To avoid switching the different tubes by mistake, they can easily be marked with different colors, using the provided set of heat shrinkable tubing.
8 Install Syringe

Remove the screw that is in the driver: you will need it afterwards when you have to fix the syringe.

Move down the driver in order to have enough space to position the syringe.

After having initialized the Dosing Unit with the Touchscreen (see documents 30036654 Touchscreen OptiMax or 30032003 Touchscreen EasyMax) move down the driver by selecting "Fill In" on the Touchscreen.
8.1 Prepare the Syringe for the Installation

1. Insert the drive screw in the syringe hole.
2. Pull down the plunger so that it will perfectly fit in the driver.
3. Remove the drive screw after you have pulled down the syringe.

NOTE: Make sure the drive screw has been fully inserted in the driver hole to assure a correct fixing of the syringe.

4. The syringe is now ready to be used.

8.2 Install the Syringe

1. Screw in the syringe below the dosing head.

NOTE: Make sure you screw it in with a 90° angle to avoid any damage to the dosing head.

2. Make sure the driver perfectly matches with the hole in the syringe plunger.

3. Screw in the drive screw in order to fix the syringe.

NOTE: Make sure the drive screw has been fully inserted in the driver hole to assure a correct fixing of the syringe.

4. The syringe is now ready to be used.
8.3 Connect the Tubes to the Dosing Head

Connect the dosing tube to the dosing head and to the dosing bottle. The tubes can be shortened; make use of a sharp knife to cut them. You can colour code the tubings with the provided heat shrink tubings.

8.3.1 Scheme: Tubes from / to the Dosing Head

<table>
<thead>
<tr>
<th>EasyMax® OptiMax™</th>
<th>Configuration with one reactor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>to Reactor</td>
</tr>
<tr>
<td></td>
<td>to dosing bottle</td>
</tr>
<tr>
<td></td>
<td>nut for UNF (closed)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EasyMax®</th>
<th>Configuration with two reactors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>to Reactor 1</td>
</tr>
<tr>
<td></td>
<td>to Reactor 2</td>
</tr>
<tr>
<td></td>
<td>to dosing bottle</td>
</tr>
</tbody>
</table>
8.4 Fill in the Tubes

Make sure that there is no air in the tubes before connecting them to the reactor. Purge and fill the tube with the same liquid you will dose in your experiment.

Perform the "Fill In" with the Touchscreen:

NOTE: For detailed information regarding the Dosing initialization and pH control, refer to documents 30036654 Touchscreen OptiMax or 30032003 Touchscreen EasyMax.

8.4.1 Connect the Tubes to the Reactor

Refer to chapter 7 to learn how to assemble a tube connection to the dosing adapter or the feed container to prepare the tube. The dosing adapters ensure the correct fitting of the tubes in the reactor.

The dosing adapters (ST14-GL14, and ST19/26-GL14) are made of glass. This ensures that they are resistant against most chemical substances and easy to clean.

Furthermore it is possible to observe the dosing process and the dosing speed inside of the dosing adapters.

With their standard ground joints (ST14 or ST19/26) they can be easily inserted into a free opening of the reactor and secured with a "Keck" clamp.

NOTE: Using both outputs of the Dosing Unit (Out1 and Out2) and the two provided ST14 dosing adapters it is possible to perform two dosing procedures in parallel into both reactors of an EasyMax®.
### 8.5 Dosing Accuracy

The data shown in the table below were obtained using water as dosing liquid with a full stroke of the syringe, and are meant as a guideline.

<table>
<thead>
<tr>
<th>Dosing Mode</th>
<th>Syringe Size in mL</th>
<th>Accuracy based on dosing rate range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single Dosing</strong></td>
<td>1</td>
<td>&lt; 2% between 0.1 and 3.7 ml/min</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>&lt; 1% between 1 and 37.5 ml/min</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>&lt; 1% between 1 and 90 ml/min</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>&lt; 1% between 1 and 50 ml/min</td>
</tr>
<tr>
<td><strong>Parallel Dosing</strong></td>
<td>1</td>
<td>&lt; 3% between 2 ml/min and 3.7 ml/min</td>
</tr>
<tr>
<td>(EasyMax only)</td>
<td>10</td>
<td>&lt; 2% between 2 ml/min and 37.5 ml/min</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>&lt; 1% between 1 and 90 ml/min</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>&lt; 1% between 1 and 50 ml/min</td>
</tr>
</tbody>
</table>

The dosing liquid properties like viscosity, volatility etc. will influence the suitable application range. **Check beforehand for your process if the dosing results meet your specific requirements with respect to accuracy and reproducibility.**

Although the syringes can cover a wide dosing speed range (see 10), we recommend to work in a dosing rate range as given in the table above or use another syringe size. Outside of indicated dosing rate range the accuracy is lower.

When working in parallel dosing mode (EasyMax only) consider that at low dosing rates the obtained accuracy is lower than dosing in single mode. We recommend to use 2 separate dosing units or to perform the dosing tasks sequentially.
9 Maintenance and Servicing of the Dosing Unit SP-50

Any maintenance or servicing not specifically described in the following must be performed by METTLER TOLEDO service. Any maintenance or service work not performed in strict accordance with the directions given in previous sections and especially the directions mentioned in the following shall absolve Mettler-Toledo AG from any liability whatsoever in regard to the consequences of such improper work!

We strongly recommend you to have the instrument inspected once a year by a METTLER TOLEDO service engineer.

9.1 Checking for Damages

We strongly recommend a visual check of the used syringe, the dosing head, all connected tubing, and the cable connections from and to the Dosing Unit for damages on a regular basis. Damaged parts must be exchanged immediately!

9.2 Replacing the Dosing Head

In case of damage of the dosing head you can replace it. Make sure you are using the right tools and loosen the correct screws.

Loosen the screws indicated by the red arrows and remove the dosing head. Be careful when reinstalling: make sure that the valve fits the drive.

Make use of a 2 mm allen key.

NOTE: When reinstalling the dosing head, make sure it perfectly fits into the dosing head interface. Rotate the dosing head as shown in the picture below in order to find the right fitting:
9.3 Replacing the Dosing Tubes

In case of damage of the tubes, you can order them from the EasyMax® or OptiMax™ product catalogues:
51710599 EasyMax Product Catalogue, 51727001 OptiMax Product Catalogue.

9.4 Replacing the Syringe

In case of damage of the syringe, you can order them from the EasyMax® or OptiMax™ product catalogues:
51710599 EasyMax Product Catalogue, 51727001 OptiMax Product Catalogue.

9.5 Cleaning the Instrument

The housing of the instrument is not watertight (i.e. splash proof). We therefore recommend to disconnect the Dosing Unit and clean the housing with a cloth moistened with ethanol.

9.6 Disposal

In accordance with the requirements of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE), this device must not be disposed of with household waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.
## Technical Data

### Dimensions
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>102 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>215 mm (including 50 mL syringe)</td>
</tr>
<tr>
<td>Height</td>
<td>298 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>4.5 kg</td>
</tr>
</tbody>
</table>

### Material
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Stainless steel (coated)</td>
</tr>
<tr>
<td>Chassis (pump unit)</td>
<td>Die-cast aluminum</td>
</tr>
</tbody>
</table>

### Power Supply
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via CAN</td>
<td>24 V</td>
</tr>
</tbody>
</table>

### Driver Drive
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle</td>
<td>Stepper motor driven lead screw with optical encoder for step loss detection</td>
</tr>
<tr>
<td>Resolution</td>
<td>48,000 steps in fine-positioning mode (0.00125 mm/fine-positioning step)</td>
</tr>
<tr>
<td>Travel</td>
<td>60 mm</td>
</tr>
<tr>
<td>Driver Speed</td>
<td>5 - 6,000 pulses per second</td>
</tr>
</tbody>
</table>

### Valve Drive
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn time</td>
<td>&lt; 250 ms between adjacent ports</td>
</tr>
<tr>
<td>Drive</td>
<td>Stepper motor with optical encoder for positioning feedback</td>
</tr>
</tbody>
</table>

### Valve
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Ceramic Valve, 3-port distribution</td>
</tr>
<tr>
<td>Body Material</td>
<td>Ceramic</td>
</tr>
<tr>
<td>Fittings</td>
<td>1/4-28&quot; tube fitting, 1/4-28&quot; syringe fitting</td>
</tr>
<tr>
<td>Fluid contact</td>
<td>Glass, Kel-F, Teflon®, ceramic</td>
</tr>
</tbody>
</table>

### Interface
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN IN connector</td>
<td>CAN Bus (RJ-12 connector, 6-pole) for connecting the Dosing Unit SP-50 to the synthesis workstation or an additional Dosing Unit.</td>
</tr>
<tr>
<td>CAN OUT connector</td>
<td>CAN Bus (RJ-12 connector, 6-pole) for connecting up to four DU SP-50 in series.</td>
</tr>
</tbody>
</table>

### Interchangeable Syringes
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>1, 10, 25 and 50 mL</td>
</tr>
<tr>
<td>Barrel Material</td>
<td>Borosilicate glass</td>
</tr>
<tr>
<td>Driver Material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Seal Material</td>
<td>Virgin Teflon® (PTFE, TFE) and UHMWPE (Black seals)</td>
</tr>
</tbody>
</table>

### Ambient conditions
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>15 °C (59 °F) to 40 °C (104 °F)</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>20 - 80% RH at 40 °C (104 °F)</td>
</tr>
<tr>
<td>Altitude</td>
<td>up to 2000 m</td>
</tr>
<tr>
<td>Use</td>
<td>indoors</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>II</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
</tbody>
</table>

### Plunger Drive
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle</td>
<td>Stepper motor driven lead screw with optical encoder for step loss detection.</td>
</tr>
<tr>
<td>Resolution</td>
<td>48,000 steps in fine-positioning mode (0.00125 mm/fine-positioning step).</td>
</tr>
</tbody>
</table>

### Programmable Dosing Speed
<table>
<thead>
<tr>
<th>Syringe Volume</th>
<th>EasyMax®</th>
<th>OptiMax®</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mL</td>
<td>0.1 - 3.7 mL/min</td>
<td>0.1 - 7.5 mL/min</td>
</tr>
<tr>
<td>10 mL</td>
<td>0.1 - 37.5 mL/min</td>
<td>0.1 - 75.0 mL/min</td>
</tr>
<tr>
<td>25 mL</td>
<td>0.1 - 93.0 mL/min</td>
<td>0.1 - 187.5 mL/min</td>
</tr>
<tr>
<td>50 mL</td>
<td>0.1 - 187.5 mL/min</td>
<td>0.1 - 375.0 mL/min</td>
</tr>
</tbody>
</table>
# 11 Chemical Resistance Chart

**Note:** The information provided in the table below has been supplied to METTLER TOLEDO by other reputable sources and is to be used ONLY as a guideline. Before use, test the equipment with the chemicals under the specific conditions of your application. Ratings of chemical behavior listed in this chart apply to a 48-hour exposure period; METTLER TOLEDO has no knowledge of possible effects beyond this period. METTLER TOLEDO does not warrant (neither express or imply) that the information in this chart is accurate or complete or that materials are suitable for any purpose.

---

**DANGER!** Variations in chemical behavior during handling due to factors such as temperature, pressure and concentration can cause equipment to fail, even though it passes initial test. **SERIOUS INJURY MAY RESULT.** Use suitable guards and/or personal protection when handling chemicals.

<table>
<thead>
<tr>
<th>Chemical Compatibility of Alumina Ceramic / Ceramic AL203</th>
<th>Chemical</th>
<th>Compatibility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetamide</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetate Solvent</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetic Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetic Acid 20%</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetic Acid 80%</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetic Acid, Glacial</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetic Anhydride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetone</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetyl Bromide</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Acetyl Chloride (dry)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acetylene</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Acrylic Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Adipic Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Amyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Benzyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Butyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Diacetone</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Ethyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Hexyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Isobutyl</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Alcohols: Isopropyl</td>
<td>A-Excellent</td>
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<tr>
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<td>Magnesium Bisulfate</td>
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<td></td>
</tr>
<tr>
<td>Magnesium Carbonate</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Magnesium Chloride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Magnesium Hydroxide</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Magnesium Oxide</td>
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<tr>
<td>Magnesium Sulfate (Epsom Salts)</td>
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<tr>
<td>Maleic Acid</td>
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<tr>
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<tr>
<td>Mash</td>
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<tr>
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<tr>
<td>Mercuric Chloride (dilute)</td>
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<tr>
<td>Methyl Acetate</td>
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<tr>
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<tr>
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<tr>
<td>Methyl Bromide</td>
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<tr>
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<tr>
<td>Nickel Nitrate</td>
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<tr>
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<tr>
<td>Nitric Acid (&lt;15% HNO3)</td>
<td>N/A</td>
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<tr>
<td>Nitric Acid (1% Acid)</td>
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<tr>
<td>Nitric Acid (15% H2SO4)</td>
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<tr>
<td>Nitric Acid (20%)</td>
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<tr>
<td>Nitric Acid (5-10%)</td>
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<tr>
<td>Nitric Acid (Concentrated)</td>
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<td>Nitrobenzene</td>
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<tr>
<td>Nitrous Oxide</td>
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<tr>
<td>Oils:Aniline</td>
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<tr>
<td>Oils:Anise</td>
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<tr>
<td>Oils:Bay</td>
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<tr>
<td>Oils:Bone</td>
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</tr>
<tr>
<td>Oils:Caster</td>
<td>A-Excellent</td>
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</tr>
<tr>
<td>Oils:Cinnamon</td>
<td>N/A</td>
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</tr>
<tr>
<td>Oils:Clove</td>
<td>N/A</td>
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<tr>
<td>Oils:Coconut</td>
<td>N/A</td>
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<tr>
<td>Oils:Cod Liver</td>
<td>N/A</td>
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<td>Oils:Corn</td>
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</tr>
<tr>
<td>Oils:Cottonseed</td>
<td>A-Excellent</td>
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</tr>
<tr>
<td>Oils:Creosote</td>
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<tr>
<td>Oils:Diesel Fuel (20, 30, 40, 50)</td>
<td>N/A</td>
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<tr>
<td>Oils:Fuel (1, 2, 3, 5A, 5B, 6)</td>
<td>N/A</td>
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<tr>
<td>Oils:Ginger</td>
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<tr>
<td>Oils:Hydraulic Oil (Petro)</td>
<td>N/A</td>
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<tr>
<td>Oils:Hydraulic Oil (Synthetic)</td>
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<td>Oils:Lemon</td>
<td>N/A</td>
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<tr>
<td>Oils:Linseed</td>
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<td>Oils:Mineral</td>
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<td>A-Excellent</td>
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</tr>
<tr>
<td>Oils:Orange</td>
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<tr>
<td>Oils:Palm</td>
<td>N/A</td>
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<tr>
<td>Oils:Peanut</td>
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<tr>
<td>Oils:Peppermint</td>
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<tr>
<td>Oils:Rapeseed</td>
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<tr>
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<tr>
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<tr>
<td>Oils: Rosin</td>
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<tr>
<td>Oils: Sesame Seed</td>
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<tr>
<td>Oils: Silicone</td>
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<tr>
<td>Oils: Soybean</td>
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<tr>
<td>Oils: Sperm (whale)</td>
<td>N/A</td>
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<tr>
<td>Oils: Tanning</td>
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<td>Oils: Transformer</td>
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<tr>
<td>Oils: Turbine</td>
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<tr>
<td>Oleic Acid</td>
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<tr>
<td>Oleum 100%</td>
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<tr>
<td>Oleum 25%</td>
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<tr>
<td>Oxalic Acid (cold)</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Phenol (10%)</td>
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<tr>
<td>Phenol (Carboxylic Acid)</td>
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<tr>
<td>Phosphoric Acid (&gt;40%)</td>
<td>A-Excellent</td>
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<tr>
<td>Phosphoric Acid (40%)</td>
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<tr>
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<tr>
<td>Phosphorus Trichloride</td>
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<tr>
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</tr>
<tr>
<td>Potash (Potassium Carbonate)</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Potassium Bicarbonate</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Potassium Bromide</td>
<td>C-Fair</td>
<td></td>
</tr>
<tr>
<td>Potassium Chlorate</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Potassium Chloride</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Potassium Chromate</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Potassium Cyanide Solutions</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Potassium Dichromate</td>
<td>B-Good</td>
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</tr>
<tr>
<td>Potassium Ferricyanide</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Potassium Ferrocyanide</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Potassium Hydroyxide (Caustic Potash)</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Potassium Hypochlorite</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Potassium Iodide</td>
<td>B-Good</td>
<td></td>
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<tr>
<td>Potassium Oxalate</td>
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<td>Potassium Permanganate</td>
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<tr>
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<tr>
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<td>Salad Dressings</td>
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<td>Salicylic Acid</td>
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<td>Salt Brine (NaCl saturated)</td>
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<tr>
<td>Soap Solutions</td>
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<tr>
<td>Soda Ash (see Sodium Carbonate)</td>
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<tr>
<td>Sodium Acetate</td>
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<tr>
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<tr>
<td>Sodium Bicarbonate</td>
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</tr>
<tr>
<td>Sodium Bisulfate</td>
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</tr>
<tr>
<td>Sodium Bisulfite</td>
<td>A-Excellent</td>
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</tr>
<tr>
<td>Sodium Borate (Borax)</td>
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<tr>
<td>Sodium Bromide</td>
<td>N/A</td>
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<tr>
<td>Sodium Carbonate</td>
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<tr>
<td>Sodium Chlorate</td>
<td>A-Excellent</td>
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</tr>
<tr>
<td>Sodium Chloride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sodium Chromate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sodium Cyanide</td>
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<td></td>
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<tr>
<td>Sodium Ferrocyanide</td>
<td>A-Excellent</td>
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<tr>
<td>Sodium Fluoride</td>
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</tr>
<tr>
<td>Sodium Hydrosulfite</td>
<td>N/A</td>
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</tr>
<tr>
<td>Sodium Hydroxide (20%)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sodium Hydroxide (50%)</td>
<td>A-Excellent</td>
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<tr>
<td>Sodium Hydroxide (80%)</td>
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<tr>
<td>Sodium Hypochlorite (&lt;20%)</td>
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<tr>
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<td></td>
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<tr>
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<td>Sodium Metasilicate</td>
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<tr>
<td>Sodium Nitrate</td>
<td>A-Excellent</td>
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</tr>
<tr>
<td>Chemical</td>
<td>Dosing Unit</td>
<td>Legende:</td>
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<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Sodium Peroxide</td>
<td>N/A</td>
<td>• A-Excellent.</td>
</tr>
<tr>
<td>Sodium Polyphosphate</td>
<td>N/A</td>
<td>• B-Good = Minor Effect, slight corrosion or discoloration.</td>
</tr>
<tr>
<td>Sodium Silicate</td>
<td>A-Excellent</td>
<td>• C-Fair = Moderate Effect, not recommended for continuous use. Softening, loss of strength, swelling may occur.</td>
</tr>
<tr>
<td>Sodium Sulfate</td>
<td>A-Excellent</td>
<td>• D-Not recommended = Severe Effect, not recommended for ANY use.</td>
</tr>
<tr>
<td>Sodium Sulfide</td>
<td>A-Excellent</td>
<td>• N/A = Information Not Available.</td>
</tr>
<tr>
<td>Sodium Sulfite</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sodium Tetraborate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sodium Thiosulfate (hypo)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Soy Sauce</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Stannic Chloride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Stannic Fluoborate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Stannous Chloride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Starch</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Stearic Acid</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Stoddard Solvent</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Styrene</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sugar (Liquids)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfur Dioxide (dry)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfur Hexafluoride</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfur Trioxide</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfur Trioxide (dry)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid (&lt;10%)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid (10-75%)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid (75-100%)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid (cold concentrated)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfuric Acid (hot concentrated)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Sulfurous Acid</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Sulfuryl Chloride</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Tallow</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Tannic Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Tanning Liquors</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Tartaric Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Tetrachloroethane</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Tin Salts</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Toluene (Toluol)</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Tomato Juice</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Trichloroacetic Acid</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Trichloroethane</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Trichloroethylene</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Trichloropropane</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Trigesylphosphate</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Triethylamine</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Trisodium Phosphate</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Turpentine</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Urea</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Uric Acid</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Urine</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Varnish</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Vegetable Juice</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Vinegar</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Vinyl Acetate</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Water, Acid, Mine</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Water, Deionized</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Water, Distilled</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Water, Fresh</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Water, Salt</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Weed Killers</td>
<td>B-Good</td>
<td></td>
</tr>
<tr>
<td>Whey</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Whiskey &amp; Wines</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>White Liquor (Pulp Mill)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>White Water (Paper Mill)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Xylene</td>
<td>A-Excellent</td>
<td></td>
</tr>
<tr>
<td>Zinc Chloride</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td>Zinc Hydrosulfite</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Zinc Sulfate</td>
<td>D-Not Recommended</td>
<td></td>
</tr>
<tr>
<td><strong>Legende:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• A-Excellent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• B-Good = Minor Effect, slight corrosion or discoloration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• C-Fair = Moderate Effect, not recommended for continuous use. Softening, loss of strength, swelling may occur.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• D-Not recommended = Severe Effect, not recommended for ANY use.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• N/A = Information Not Available.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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1 Einleitung

Die DU SP-50 ist eine volumetrische Dosiereinheit, mit der hochgenaue Dosierungen durchgeführt werden können. Gesteuert wird über das Touchscreen der jeweiligen Synthesearbeitsstation (OptiMax™, EasyMax®) oder über die iControl™ Software. Im Gegensatz zu anderen Dosiervorrichtungen benötigt die DU SP-50 kein eigenes Stromkabel, wenn sie an eine Synthesearbeitsstation von METTLER TOLEDO angeschlossen wird. Die gesamte Kommunikation und auch die Stromversorgung erfolgt über ein CAN Kabel.

- Es stehen vier verschiedene Spritzenvolumina (von 1 mL bis 50 mL) zur Auswahl.
- Die Installation und Inbetriebnahme ist dank Plug & Play einfach durchzuführen.
- Mit nur einer Dosiereinheit kann im Reaktor des OptiMax™ dosiert werden.
- Mit nur einer Dosiereinheit kann gleichzeitig in beide Reaktoren des EasyMax® dosiert werden.

Wir, die Mettler-Toledo AG, lehnen jede Haftung ab, wenn die folgenden Regeln und Massnahmen für den sicheren Betrieb der Dosiereinheit SP-50 nicht beachtet werden.
2 Sicherheitsmassnahmen

Die Dosiereinheit SP-50 ist für die Versuche und Bestimmungen geprüft, die in dieser Bedienungsanleitung dokumentiert sind. Dies befreit jedoch nicht von der Verpflichtung zur eigenen Prüfung des gelieferten Produkts auf seine Eignung für die beabsichtigten Verfahren und Zwecke. Befolgen Sie deshalb die folgenden Sicherheitsmassnahmen.

2.1 Massnahmen zu Ihrem Schutz

Stromausfall
- Treffen Sie geeignete Massnahmen gegen möglicherweise fatale Folgen eines Stromausfalls!

Explosionsgefahr

Explosionsgefährdete Umgebung
- Arbeiten Sie nicht in explosionsgefährdeter Umgebung! Das Gehäuse des Geräts ist nicht gasdicht (Explosionsgefahr durch Funkenbildung, Korrosion durch eindringende Gase).
- Vermeiden Sie statische Aufladung.
- Vermeiden Sie die Freisetzung von korrosiven oder explosionsgefährlichen Gasen.

Explosionsgefahr

Druck im Dosiersystem
- Die Dosiereinheit ist nicht für den Einsatz unter Druck geeignet. Versuchen Sie niemals das Dosiersystem unter Druck zu setzen oder mit einem unter Druck stehenden Dosiersystem zu arbeiten.

Explosionsgefahr

Schläuche
- Prüfen Sie die Schläuche und den Dosierkopf vor jedem Einsatz auf eventuelle Beschädigungen und Undichtheiten.

Explosionsgefahr
2.2 Massnahmen zur Betriebssicherheit

Anschluss von Kabeln
- Ziehen Sie die Kabel nicht während des Betriebs aus! Die Leiterplatte des Geräts kann sonst beschädigt werden.

Vorsicht

Service
- Öffnen Sie niemals das Gehäuse des Gerätes! Lassen Sie das Gerät nur vom METTLER TOLEDO Service warten!

Vorsicht

Allgemein
- Schliessen Sie folgende Umwelteinflüsse aus:
  - Starke Vibrationen
  - Direkte Sonneneinstrahlung
  - Luftfeuchtigkeit über 80%
  - Temperaturen unter 15 °C und über 40 °C
  - starke elektrische oder magnetische Felder

Vorsicht

Verwendung
- Es wird empfohlen, die Dosiereinheit SP-50 nur mit dem Lieferumfang und optionale Zubehör von METTLER TOLEDO zu betreiben.

Vorsicht

Flüssigkeiten
- Stellen Sie sicher, dass Sie keine Flüssigkeiten dosieren, deren Viskosität sich während der Dosierung (z.B. Kristallisation oder Polymerisation) ändern kann. Dies blockiert die Dosierleitungen / Ventil und kann zu Schäden führen.
- Reduzieren sie die Füllgeschwindigkeit mit zunehmender Flüchtigkeit der zu dosierenden Flüssigkeit. Es kann sich sonst ein Vakuum bilden, das Luftblasen zur Folge hat. Dies wiederrum führt zu einer nicht vollständigen Füllung der Spritzen und somit zu falschen Dosiermengen.
**Füll-/Dosiergeschwindigkeit**


**Genauigkeit/Reproduzierbarkeit**

- Bevor Sie Dosierungen mit "ihren" Flüssigkeiten durchführen, müssen Sie prüfen und sicherstellen, dass das Equipment ihre Anforderungen im Hinblick auf Genauigkeit und Reproduzierbarkeit erfüllt. Siehe Kapitel 8.5.
3  Dosiereinheit SP-50 - Vorder-/Rückseite

4  Dosiereinheit installieren

4.1  Positionierung der Dosiereinheit

Die Dosiereinheit kann auf der linken oder rechten Seite der Synthesearbeitsstation (OptiMax™, EasyMax®) aufgestellt werden. Eingebaute Magnete sichern den gegenseitigen Halt und verhindern versehentliches Verschieben.

Beim Arbeiten mit einem EasyMax® wird die Dosiereinheit idealerweise auf der Seite der Synthesearbeitsstation platziert auf der später dosiert wird (links: Zone 1, rechts: Zone 2).

Mit der Halterung auf der Rückseite ist es möglich die Dosiereinheit an einer Stativstange zu befestigen.

HINWEIS: Die magnetische Verbindung zwischen Dosiereinheit und Synthesearbeitsstation oder verschiedenen Dosiereinheiten ist nicht stark genug, um eine sichere Verbindung beim Transport zu gewährleisten.
4.2 Dosiereinheit an EasyMax® / OptiMax™ anschliessen

Die Stromversorgung und Kommunikation zwischen Synthesearbeitsstation und Dosiereinheit erfolgt über den CAN Bus. Das CAN Bus Kabel (Lieferumfang) muss zwischen der Synthesearbeitsstation (CAN OUT) und der Dosiereinheit (CAN IN) angeschlossen werden.

Anschliessen der Dosiereinheit an einen EasyMax® mit CAN Bus Kabel.

Anschliessen der Dosiereinheit an einen OptiMax™ mit CAN Bus Kabel.
5  Anzahl der Dosiereinheiten

Bis zu 4 Dosiereinheiten können an den EasyMax® oder den OptiMax™ via CAN Bus angeschlossen werden. Wenn mehr als eine Dosiereinheit angeschlossen ist, werden alle weiteren Dosiereinheiten in Serie angeschlossen. Das bedeutet, dass eine zweite Dosiereinheit an den CAN Out Anschluss der ersten Dosiereinheit angeschlossen wird.

HINWEIS: Nur eine Dosiereinheit kann zur pH-Kontrolle verwendet werden.

6  Dosiereinheit LED

Die LED der Dosiereinheit zeigt den Status des Gerätes an. Sie ist auf der unteren, rechten Vorderseite platziert.

Die LED der Dosiereinheit zeigt die verschiedenen Stati mit drei Farben an.

<table>
<thead>
<tr>
<th>Farbe</th>
<th>Bedeutung</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRÜN</td>
<td>Initialisiert / Aktiv</td>
<td>Normaler Status</td>
</tr>
<tr>
<td>GRÜN blinkt</td>
<td>Dosiern</td>
<td>Das Gerät dosiert</td>
</tr>
<tr>
<td>ROT</td>
<td>Fehler</td>
<td>Überprüfen Sie die Fehlermeldung auf dem Touchscreen oder in der iControl Software</td>
</tr>
<tr>
<td>ORANGE</td>
<td>Initialisierung im Gang</td>
<td>Warten Sie, bis der Prozess abgeschlossen ist</td>
</tr>
</tbody>
</table>
7 Installation der Schlauchverbindungen

Der Anschluss der Schläuche wird über UNF-Quetschverschraubungen (UNF 1/4" 28G) und GL14 Anschlüssen bewerkstelligt. Die dazugehörigen Schläuche sind aus PTFE und weisen einen Durchmesser von 1/8" = 3.2 mm bzw. 1/16" = 1.6 mm auf.

7.1 Verbindung zwischen Schlauch und Dosieradapter oder Flaschenverteiler

![Fig. 1: Schlauchverbindung zum Dosieradapter montieren (Schlauchdurchmesser 3.2 mm)](image1)

- Eine Schraubverbindungskappe GL14 (1) über den Schlauch schieben.
- Dann eine UNF 1/4" 28-Mutter (2) und eine UNF 1/4" 28-Klemmhülse (3) über den Schlauch schieben - hierbei darauf achten, dass die Klemmhülse mit der spitz zulaufenden Seite zur Mutter montiert wird.
- Anschließend kann die Verschraubung auf den Dosieradapter oder auf den Flaschenverteiler aufgeschraubt werden.

Für die entsprechende Schlauchverbindung mit dünnerem Schlauchdurchmesser (1.6 mm) muss anstelle der **gelben** UNF 1/4" 28-Klemmhülse (3) die **blaue** Klemmhülse (3a) und anstelle der UNF 1/4" 28-Mutter (2) die Mutter (2a) jeweils mit dem entsprechend kleineren Innendurchmesser verwendet werden.

![Fig. 2: Schlauchverbindung zum Dosieradapter montieren (Schlauchdurchmesser 1.6 mm)](image2)

**2a** UNF 1/4" 28-Mutter für 1/16" (1.6 mm) Schlauch

**3a** UNF 1/4" 28-Klemmhülse für 1/16" (1.6 mm) Schlauch
Die Schlauchverbindungen können nun auf den Dosieradapter (NS14-GL14, oder NS19-GL14) oder auf den Flaschenverteiler der Vorratsflasche geschraubt werden:

Fig. 3: Schlauchverbindung auf den Dosieradapter schrauben

Fig. 4: Schlauchverbindung auf den Flaschenverteiler schrauben

_Achtung!
_ Bei der Schlauchmontage müssen Sie auf den minimal zulässigen Biegeradius achten!
Bei 1/8"-Schläuchen darf ein Biegeradius von 1/2" (12.7 mm) nicht unterschritten werden.
_Falls Sie mit der Dosiereinheit nur eine Dosierung über einen der beiden Ausgänge (Out1 oder Out2) durchführen, sollten Sie den anderen, nicht benutzten Ausgang, mit einem der mitgelieferten Verschluss-Stopfen verschließen._
_Um Verwechslungen zu vermeiden, können die verschiedenen Schläuche mit Hilfe des beiliegenden Schrumpfschlauchsets verschiedenfarbig markiert werden._
8 Spritze installieren

Entfernen Sie die Schraube aus dem Stössel.

Nach der Initialisierung der Dosiereinheit via Touchscreen (siehe Dokumente 30036654 oder 30032003 OptiMax Touchscreen EasyMax), bewegen Sie den Stössel durch Auswahl von "Füllen In" auf dem Touchscreen nach unten.

Bewegen Sie den Stössel nach unten, um genügend Platz für den Einbau der Spritze zu haben.
8.1 Einbau der Spritze

1. Führen Sie die Schraube in das Loch im Stössel ein. 
2. Ziehen Sie den Stempel hinunter, so dass sie perfekt in den Stössel passt. 
3. Entfernen Sie die Schraube vom Stössel, nachdem Sie den Stempel heruntergezogen haben. 

8.2 Spritze installieren 

1. Schrauben Sie die Spritze von unten in das Ventil. 

HINWEIS: Achtung! Schrauben Sie die Spritze in einem 90 ° Winkel ein, um Schäden am Ventil zu vermeiden. 

2. Das Loch im Stössel muss perfekt auf den Antrieb passen. 

3. Setzen Sie die Schraube in den Stössel ein, um die Spritze zu befestigen. 

HINWEIS: Stellen Sie sicher, dass die Stößelschraube voll im Loch eingeschraubt ist. 

4. Die Spritze kann nun betrieben werden.
8.3 Dosierschläuche anschliessen


8.3.1 Schema: Schläuche von / zum Ventil

<table>
<thead>
<tr>
<th>EasyMax®</th>
<th>OptiMax™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Konfiguration mit einem Reaktor</td>
<td>zur Dosierflasche</td>
</tr>
<tr>
<td>zum Reaktor</td>
<td>UNF Schraube (Blindstopfen)</td>
</tr>
<tr>
<td>EasyMax®</td>
<td>Konfiguration mit zwei Reaktoren</td>
</tr>
<tr>
<td>zum Reaktor 1</td>
<td>zum Reaktor 2</td>
</tr>
</tbody>
</table>
8.4 Schläuche füllen

Stellen Sie sicher, dass keine Luft mehr in den Schläuchen ist, bevor Sie sie an den Reaktor anschliessen. Füllen Sie den Schlauch mit der gleichen Flüssigkeit, die im Experiment verwendet wird.

Steuern Sie die Dosiereinheit mit dem Touchscreen, um die Schläuche zu füllen:

HINWEIS: Detaillierte Informationen zur Initialisierung der Dosierung und zur pH-Kontrolle finden Sie in den Dokumenten 30036654 OptiMax Touchscreen oder 30032003 EasyMax Touchscreen).

8.4.1 Beschreibung des Dosieradapters

Siehe Kapitel 7, um zu lernen, wie man einen Schlauch an den Dosieradapter oder den Vorratsbehälter anschliesst, um den Schlauch für die Dosierung vorzubereiten. Der Dosieradapter garantiert die korrekte Montage der Schläuche in den Reaktor.


Ferner ist es möglich, den Dosiervorgang und die Dosiergeschwindigkeit im Dosieradapter zu beobachten.

Mit ihren Normschliffen (ST14 oder ST19) können sie leicht in eine freie Öffnung des Reaktors eingesetzt werden und mit einer passenden "Keck" Klemme befestigt werden.

HINWEIS: Die Verwendung beider Ausgänge der Dosiereinheit (OUT1 und OUT2) und der beiden mitgelieferten Adapter ST14 ist es möglich, zwei Dosierungen parallel in beide Reaktoren eines EasyMax® durchzuführen.
8.5 Dosiergenauigkeit

Die in untenstehender Tabelle aufgelisteten Daten wurden mit dem vollen Spritzenvolumen und Wasser als Dosierflüssigkeit bestimmt. Sie sind als Leitfaden gedacht.

<table>
<thead>
<tr>
<th>Dosiermodus</th>
<th>Spritzenvolumen in mL</th>
<th>Genauigkeit in Abhängigkeit der Dosiersgeschwindigkeit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Einzeldosierung</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>&lt; 2% zwischen 0.1 und 3.7 ml/min</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>&lt; 1% zwischen 1 und 37.5 ml/min</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>&lt; 1% zwischen 1 und 90 ml/min</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>&lt; 1% zwischen 1 und 50 ml/min</td>
</tr>
<tr>
<td><strong>Parallele Dosierung</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(nur EasyMax)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>&lt; 3% zwischen 2 ml/min und 3.7 ml/min</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>&lt; 2% zwischen 2 ml/min und 37.5 ml/min</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>&lt; 1% zwischen 1 und 90 ml/min</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>&lt; 1% zwischen 1 und 50 ml/min</td>
</tr>
</tbody>
</table>

Einige Eigenschaften der Dosierflüssigkeit wie Viskosität, Flüchtigkeit usw. beeinflussen den anwendbaren Einsatzbereich. **Prüfen Sie unbedingt vorher, ob die zu erwartenden Dosierparameter im Hinblick auf Genauigkeit und Reproduzierbarkeit den Anforderungen an Ihren Prozess erfüllen.**

Auch wenn die Spritzen in einem weiten Dosiersgeschwindigkeitsbereich arbeiten können (siehe Kapitel 10), empfehlen wir in den in obiger Tabelle aufgeführten Bereichen zu arbeiten oder ggf. die Spritzengröße zu ändern. Ausserhalb dieser Bereiche steigt die Ungenauigkeit.

Berücksichtigen Sie beim parallelen Dosieren (nur EasyMax), dass die Genauigkeit bei tiefen Dosierraten niedriger ist, als bei Einzeldosierungen. Es kann sinnvoll sein, entweder 2 separate Dosiereinheiten einzusetzen, oder die Dosierungen nacheinander zu fahren.
9 Wartung und Unterhalt

Alle Unterhalts- oder Servicearbeiten, die über die hier gegebenen Beschreibungen hinausgehen, müssen vom METTLER TOLEDO Service durchgeführt werden.

Wir, die Mettler-Toledo lehnen jede Haftung für Folgen von Service- und Unterhaltsarbeiten ab, wenn diese nicht in strikter Übereinstimmung mit obiger und den unter den einzelnen Punkten erwähnten Vorschriften durchgeführt werden!

Wir empfehlen Ihnen darüber hinaus, das Gerät jährlich durch den METTLER TOLEDO Service prüfen zu lassen.

9.1 Prüfung auf Beschädigungen

Wir empfehlen eine regelmässige Überprüfung der verwendeten Spritze, des Dosierkopfes, aller angeschlossenen Schläuche und aller Kabelverbindungen von und zum Gerät auf Beschädigungen. Beschädigte Komponenten müssen unverzüglich ausgetauscht werden!

9.2 Ventil ersetzen

Im Falle einer Beschädigung kann das Ventil ersetzt werden. Stellen Sie sicher, dass Sie die richtigen Werkzeuge benutzen und Sie die richtigen Schrauben lösen.

Lösen Sie die Schrauben (rote Pfeile) und ziehen das Ventil nach vorne. Achten Sie beim Wiedereinbau darauf, dass der Kolben in der richtigen Position steht und in das Ventil passt.

Benutzen Sie einen 2 mm Inbus-Schlüssel.

HINWEIS: Stellen Sie sicher, dass bei der Neuinstallation des Ventils, dieses perfekt in die Schnittstelle passt. Drehen Sie das Ventil, wie unten abgebildet, bis die richtige Position gefunden ist:
9.3 Dosierschläuche ersetzen

Im Falle einer Beschädigung der Schläuche, können Sie diese aus dem EasyMax® oder OptiMax™ Produktkataloge bestellen: 51710599 EasyMax Produktkatalog, 51727001 OptiMax Produktkatalog.

9.4 Spritze ersetzen

Im Falle einer Beschädigung der Spritze, können Sie diese aus dem EasyMax® oder OptiMax™ Produktkataloge bestellen: 51710599 EasyMax Produktkatalog, 51727001 OptiMax Produktkatalog.

9.5 Gerät reinigen


9.6 Entsorgung


Bitte entsorgen Sie dieses Produkt in einer getrennten Sammlung für Elektro- und Elektronikgeräte.

Bei allfälligen Fragen wenden Sie sich bitte an die zuständige Behörde oder den Händler, bei dem Sie dieses Gerät erworben haben.

Bei Weitergabe dieses Gerätes (z.B. für private oder gewerbliche/industrielle Weiternutzung) ist diese Bestimmung sinngemäß weiterzugeben.

Vielen Dank für Ihren Beitrag zum Schutz der Umwelt.
## Technische Daten

<table>
<thead>
<tr>
<th><strong>Dimensionen</strong></th>
<th>Breite</th>
<th>102 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tiefe</td>
<td>215 mm (mit 50 mL-Spritze)</td>
</tr>
<tr>
<td></td>
<td>Höhe</td>
<td>298 mm</td>
</tr>
<tr>
<td></td>
<td>Gewicht</td>
<td>4.5 kg</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Materialien</strong></th>
<th>Gehäuse</th>
<th>Edelstahl (beschichtet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chassis (Pumpeneinheit)</td>
<td>Aluminiumdruckguss</td>
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</table>

| **Stromversorgung** | Über CAN | 24 V |

<table>
<thead>
<tr>
<th><strong>Antrieb Stössel</strong></th>
<th>Antriebsart</th>
<th>Gewindespindel, angetrieben von einem Schrittmotor mit optischem Sensor für die Detektierung von Schrittverlusten.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Auflösung</td>
<td>48000 Schritte im Feinpositionierungs-Modus (0.00125 mm/Feinpositionierungsschritt)</td>
</tr>
<tr>
<td></td>
<td>Hub</td>
<td>60 mm</td>
</tr>
<tr>
<td></td>
<td>Stösselgeschwindigkeit</td>
<td>5 - 6,000 Pulse pro Sekunde</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ventilantrieb</strong></th>
<th>Drehgeschwindigkeit</th>
<th>&lt; 250 ms zwischen benachbarten Ausgängen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Antriebsart</td>
<td>Schrittmotor mit optischem Sensor für Positionierungs-Rückmeldung</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ventil</strong></th>
<th>Typ</th>
<th>3-Wege Keramikventil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material Korpus</td>
<td>Keramik</td>
</tr>
<tr>
<td></td>
<td>Dichtungen</td>
<td>1/4-28&quot; Schlauchanschluss, 1/4-28&quot; Spritzenanschluss</td>
</tr>
<tr>
<td></td>
<td>Flüssigkeitskontakt</td>
<td>Glas, Kel-F, Teflon®, Keramik</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Schnittstelle</strong></th>
<th>CAN IN Buchse</th>
<th>CAN Bus (RJ-12 Stecker, 6-Pol) zum Anschluss der Dosiereinheit SP-50 an die Synthese-arbeitsstation oder eine weitere Dosiereinheit.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAN OUT Buchse</td>
<td>CAN Bus (RJ-12 Stecker, 6-Pol) zum Anschluss einer weiteren Dosiereinheit in Serie.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Auswechselbare Spritzen</strong></th>
<th>Volumen</th>
<th>1, 10, 25 und 50 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material Zylinder</td>
<td>Borosilikatglas</td>
</tr>
<tr>
<td></td>
<td>Material Stempel</td>
<td>Edelstahl</td>
</tr>
<tr>
<td></td>
<td>Material Dichtung</td>
<td>Reines Teflon® (PTFE, TFE) und UHMWPE (Schwarze Dichtungen)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Umgebungsbedingungen</strong></th>
<th>Betriebstemperatur</th>
<th>15 °C (59 °F) bis 40 °C (104 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Betriebsfeuchtigkeit</td>
<td>20 - 80% RH bei 40 °C (104 °F)</td>
</tr>
<tr>
<td></td>
<td>Höhe</td>
<td>bis 2000 ü. M.</td>
</tr>
<tr>
<td></td>
<td>Verwendung</td>
<td>in Innenräumen</td>
</tr>
<tr>
<td></td>
<td>Überspannungskategorie</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>Verschmutzungsgrad</td>
<td>2</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Stösselantrieb</strong></th>
<th>Bestandteil</th>
<th>Schrittmotor-Antriebspindel mit optischem Encoder für Schritt-Verlust Delektion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Auflösung</td>
<td>48.000 Schritte in Feinpositions-Modus (0.00125 mm/Schritt Feinposition)</td>
</tr>
<tr>
<td></td>
<td>Programmierbare Dosiergeschwindigkeit</td>
<td>EasyMax®, OptiMax™</td>
</tr>
<tr>
<td></td>
<td>1 mL Spritze</td>
<td>0.1 - 3.7 mL/min 0.1 - 7.5 mL/min</td>
</tr>
<tr>
<td></td>
<td>10 mL Spritze</td>
<td>0.1 - 37.5 mL/min 0.1 - 75.0 mL/min</td>
</tr>
<tr>
<td></td>
<td>25 mL Spritze</td>
<td>0.1 - 93.0 mL/min 0.1 - 187.5 mL/min</td>
</tr>
<tr>
<td></td>
<td>50 mL Spritze</td>
<td>0.1 - 187.5 mL/min 0.1 - 375.0 mL/min</td>
</tr>
</tbody>
</table>
11 Übersicht der Chemikalienbeständigkeit


### Chemical Compatibility of Alumina Ceramic / Ceramic AL203

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Compatibility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetamide</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetate Solvent</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetic Acid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetic Acid 20%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetic Acid 80%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetic Acid, Glacial</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetic Anhydride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetone</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetyl Bromide</td>
<td>N/A</td>
</tr>
<tr>
<td>Acetyl Chloride (dry)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acetylene</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Acrylonitrile</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Adipic Acid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Amyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Benzyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Butyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Diacetone</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Ethyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Hexyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Isobutyl</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alcohols: Isopropyl</td>
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</tr>
<tr>
<td>Alcohols: Methyl</td>
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<tr>
<td>Alcohols: Octyl</td>
<td>A-Excellent</td>
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<tr>
<td>Alcohols: Propyl</td>
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</tr>
<tr>
<td>Aluminum Chloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Chloride 5%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Chloride 20%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Fluoride</td>
<td>N/A</td>
</tr>
<tr>
<td>Aluminum Hydroxide</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Nitrate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Potassium Sulfate 10%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aluminum Sulfate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Alums</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Amines</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonia 10%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonia Nitrate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonia anhydrous</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonia, liquid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Acetate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Bifluoride</td>
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</tr>
<tr>
<td>Ammonium Carbonate</td>
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</tr>
<tr>
<td>Ammonium Caseinate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Chloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Hydroxide</td>
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</tr>
<tr>
<td>Ammonium Nitrate</td>
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</tr>
<tr>
<td>Ammonium Oxalate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Persulfate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Phosphate, Dibasic</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Phosphate, Mono-basic</td>
<td>C-Fair</td>
</tr>
<tr>
<td>Ammonium Phosphate, Tribasic</td>
<td>C-Fair</td>
</tr>
<tr>
<td>Ammonium Sulfate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Sulfite</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Ammonium Thiosulfate</td>
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</tr>
<tr>
<td>Amyl Acetate</td>
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</tr>
<tr>
<td>Amyl Alcohol</td>
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<tr>
<td>Amyl Chloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aniline</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aniline Hydrochloride</td>
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</tr>
<tr>
<td>Antifreeze</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Antimony Trichloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Aqua Regia (80% HCl, 20% HNO3)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Arochlor 1248</td>
<td>A-Excellent</td>
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<tr>
<td>Aromatic Hydrocarbons</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Arsenic Acid</td>
<td>A-Excellent</td>
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<tr>
<td>Arsenic Salts</td>
<td>A-Excellent</td>
</tr>
<tr>
<td></td>
<td>Dosing Unit SP-50</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Asphalt</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Barium Carbonate</td>
<td>A-Excellent</td>
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<tr>
<td>Barium Chloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Barium Cyanide</td>
<td>A-Excellent</td>
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<tr>
<td>Barium Hydroxide</td>
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<tr>
<td>Barium Nitrate</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Barium Sulfate</td>
<td>C-Fair</td>
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<tr>
<td>Barium Sulfide</td>
<td>C-Fair</td>
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<td>Beer</td>
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<td>Beet Sugar Liquids</td>
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<td>Benzaldehyde</td>
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<td>Benzene</td>
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<td>Benzene Sulfonic Acid</td>
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<td>Boric Acid</td>
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<td>Bromine</td>
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<td>Butadiene</td>
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<td>Butane</td>
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<td>Butanol (Butyl Alcohol)</td>
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<td>Butyl Amine</td>
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<td>Butyl Ether</td>
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<td>A-Excellent</td>
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<td>Butyric Acid</td>
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<tr>
<td>Calcium Bisulfate</td>
<td>A-Excellent</td>
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<tr>
<td>Calcium Bisulfide</td>
<td>A-Excellent</td>
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<td>Calcium Bisulfite</td>
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<td>Calcium Carbonate</td>
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<tr>
<td>Calcium Chlorate</td>
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<tr>
<td>Calcium Hydroxide</td>
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<tr>
<td>Calcium Hypochlorite</td>
<td>C-Fair</td>
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<td>Calcium Nitrate</td>
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</tr>
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<td>Calcium Oxide</td>
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<td>Calgon</td>
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<td>Cane Juice</td>
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<td>Carbolic Acid (Phenol)</td>
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<tr>
<td>Carbon Bisulfide</td>
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<tr>
<td>Carbon Dioxide (dry)</td>
<td></td>
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<td>Carbon Dioxide (water)</td>
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<td>Carbon Disulfide</td>
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<tr>
<td>Carbon Monoxide</td>
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<tr>
<td>Honey</td>
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<td>Hydraulic Oil (Petro)</td>
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<td>Hydrazine</td>
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<tr>
<td>Hydrobromic Acid 100%</td>
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<tr>
<td>Hydrobromic Acid 20%</td>
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</tr>
<tr>
<td>Hydrochloric Acid 100%</td>
<td>C-Fair</td>
</tr>
<tr>
<td>Hydrochloric Acid 20%</td>
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<tr>
<td>Hydrochloric Acid 37%</td>
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<tr>
<td>Hydrocholic Acid, Dry Gas</td>
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<td>Hydrocyanic Acid</td>
<td>N/A</td>
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<tr>
<td>Hydrocyanic Acid (Gas 10%)</td>
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<td>Hydrofluoric Acid 100%</td>
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<td>Hydrofluoric Acid 50%</td>
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<tr>
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<tr>
<td>Hydrofluosilic Acid 100%</td>
<td>N/A</td>
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<tr>
<td>Hydrofluosilic Acid 20%</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Gas</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Peroxide 10%</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Peroxide 100%</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Hydrogen Peroxide 30%</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Peroxide 50%</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydrogen Sulfide (aquas)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Hydrogen Sulfide (dry)</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydroquinone</td>
<td>N/A</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Iodine</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>Oils: Creosote</td>
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<tr>
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<td>Substance</td>
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<td>Oils: Rosin</td>
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<td>Oils: Sesame Seed</td>
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<td>Oils: Silicone</td>
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<td>Oils: Sperm (whale)</td>
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<tr>
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<tr>
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<td>Substance</td>
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<tr>
<td>Styrene</td>
<td>N/A</td>
</tr>
<tr>
<td>Sugar (Liquids)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfate (Liquors)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Chloride</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Dioxide (dry)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Hexafluoride</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Trioxide</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfur Trioxide (dry)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfuric Acid (&lt;10%)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Sulfuric Acid (10-75%)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Sulfuric Acid (75-100%)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Sulfuric Acid (cold concentrated)</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfuric Acid (hot concentrated)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Sulfurous Acid</td>
<td>N/A</td>
</tr>
<tr>
<td>Sulfuryl Chloride</td>
<td>N/A</td>
</tr>
<tr>
<td>Tallow</td>
<td>N/A</td>
</tr>
<tr>
<td>Tannic Acid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Tanning Liquors</td>
<td>N/A</td>
</tr>
<tr>
<td>Tartaric Acid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Tetrachloroethane</td>
<td>N/A</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>N/A</td>
</tr>
<tr>
<td>Tetrahydrofuran</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Tin Salts</td>
<td>N/A</td>
</tr>
<tr>
<td>Toluene (Toluol)</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Tomato Juice</td>
<td>N/A</td>
</tr>
<tr>
<td>Trichloroacetic Acid</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Trichloroethylene</td>
<td>N/A</td>
</tr>
<tr>
<td>Trichloroethylene</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Trichloropropane</td>
<td>N/A</td>
</tr>
<tr>
<td>Tricresylphosphate</td>
<td>D-Not Recommended</td>
</tr>
<tr>
<td>Triethylamine</td>
<td>B-Good</td>
</tr>
<tr>
<td>Trisodium Phosphate</td>
<td>N/A</td>
</tr>
<tr>
<td>Turpentine</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Urea</td>
<td>B-Good</td>
</tr>
<tr>
<td>Uric Acid</td>
<td>D-Not Recommended</td>
</tr>
<tr>
<td>Urine</td>
<td>N/A</td>
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<tr>
<td>Varnish</td>
<td>N/A</td>
</tr>
<tr>
<td>Vegetable Juice</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Vinegar</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Vinyl Acetate</td>
<td>B-Good</td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Water, Acid, Mine</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Water, Deionized</td>
<td>B-Good</td>
</tr>
<tr>
<td>Water, Distilled</td>
<td>N/A</td>
</tr>
<tr>
<td>Water, Fresh</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Water, Salt</td>
<td>B-Good</td>
</tr>
<tr>
<td>Weed Killers</td>
<td>B-Good</td>
</tr>
<tr>
<td>Whey</td>
<td>N/A</td>
</tr>
<tr>
<td>Whiskey &amp; Wines</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>White Liquor (Pulp Mill)</td>
<td>N/A</td>
</tr>
<tr>
<td>White Water (Paper Mill)</td>
<td>N/A</td>
</tr>
<tr>
<td>Xylene</td>
<td>A-Excellent</td>
</tr>
<tr>
<td>Zinc Chloride</td>
<td>D-Not Recommended</td>
</tr>
<tr>
<td>Zinc Hydrosulfite</td>
<td>N/A</td>
</tr>
<tr>
<td>Zinc Sulfate</td>
<td>D-Not Recommended</td>
</tr>
</tbody>
</table>

**Legende:**

- **A-Excellent.**
- **B-Good = Minor Effect, slight corrosion or discoloration.**
- **C-Fair = Moderate Effect, not recommended for continuous use. Softening, loss of strength, swelling may occur.**
- **D-Not recommended = Severe Effect, not recommended for ANY use.**
- **N/A = Information Not Available.**
EC - DECLARATION OF CONFORMITY

Mettler-Toledo AG (MTANA)
Sonnenbergstrasse 74
CH-8603 Schwerzenbach, Switzerland

herewith declares that the product
Multi-reactor system for performing parallel synthesis
EASYMAX 102 (EASYMAX xxx - Series)
For additional types, see page type code
For optional equipment, see page accessories

certified model:
--

is in conformity with the provisions of the following EC directives (incl. all applicable amendments)
2006/95/EC Low voltage (LVD)
2004/108/EC Electromagnetic compatibility (EMC)

and that the standards have been applied.

Last two digits of the year in which the CE marking was affixed: 08

References of standards for this declaration of conformity, or parts thereof:
Harmonized standards of Europe and Switzerland:

EMC standards:
EN61326-1:2006 (class B)
EN61326-1:2006 (Industrial environments)

Metrological standards:
--

IP standards:
--

Standards for Canada, USA and Australia
CAN/CSA C22.2 No. 61010-1-04 & -2-010
UL Std No. 61010A-1

AS/NZS CISPR 22, AS/NZS 61000.4.3

Doku-Nr.: 20080006

Renate Müller
Product Manager

General Manager Mettler-Toledo AutoChem

02.02.2009

Rex Ferreira

released: 9.12.2004 / ATL
EC - DECLARATION OF CONFORMITY
EG-Konformitätserklärung
KD-Nr.: 51161711 A

Type code
Typenschlüssel

other types of same construction:
andere Typen/Modelle mit der gleichen Konstruktion:

EASYMAX 102
Tested type

EASYMAX
Series name

xxx
Design (number and size of reactors)

Where x in the model designation may be up to 3
digits can be any number 0 to 9 denoting
SELV/ELV secondary circuits or minor mechanical
differences.

Remarks
Bemerkungen.

released: 9.12.2004 / ATL
Seite 2 von 3
Accessories
Zubehör und Optionen

Dosing-Unit, type SP-50 (24VDC 36W)
**Quality certificate.** Development, production and testing according to ISO 9001. Environmental management system according to ISO 14001.

**Worldwide service.** Our extensive service network is among the best in the world and ensures maximum availability and service life of your product.

**European conformity.** The CE conformity mark provides you with the assurance that our products comply with the most recent EU directives.

**On the internet.** You will quickly find lots of essential information about our products, our services and our company at [http://www.mt.com](http://www.mt.com)