Documentation OptiFlex 2 V

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using OptiFlex 2 V Fresh powder system.

These safety regulations must be read and understood before the OptiFlex 2 V is put into operation.

Safety symbols (pictograms)

The following contains a list of warnings with their meanings found in the Gema operating instructions. Apart from the regulations in the relevant operating instructions, the general safety precautions must also be followed.

DANGER!

danger due to live electricity or moving parts. Possible consequences: Death or serious injury

ATTENTION!

improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

INFORMATION!

useful tips and other information
The OptiFlex 2 V Fresh powder system is state of the art equipment that conforms to the recognized technical safety regulations and is designed for normal powder coating applications.

Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If the OptiFlex 2 V is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use.

The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.

Furthermore, the country-specific safety regulations also must be observed.

Additional safety and operation notices can be found on the accompanying CD or on the homepage www.gemapowdercoating.com.

Start-up is forbidden until it has been established that the OptiFlex 2 V fresh powder system has been set up and wired according to the EU guidelines for machinery.

Unauthorized modifications to the OptiFlex 2 V fresh powder system exempt the manufacturer from any liability from resulting damages or accidents.

The operator must ensure that all users do have the appropriate training for powder spraying equipment and are aware of the possible sources of danger.

Any operating method, which will negatively influence the technical safety of the powder spraying equipment, is to be avoided.
For your own safety, only use accessories and attachments listed in the operating instructions. The use of other parts can lead to risk of injury. Only original Gema spare parts should be used!

Repairs must only be carried out by specialists or by authorized Gema service centers. Unauthorized conversions and modifications can lead to injuries and damage to the equipment and invalidate the Gema Switzerland GmbH guarantee.

The connecting cables between the control unit and the spray gun must be installed in such a way, that they cannot be damaged during the operation. Please observe the local safety regulations!

The plug connections between the powder spraying equipment and the mains should only be removed when the power supply is switched off.

All maintenance activities must take place when the powder spraying equipment is switched off.

The powder coating equipment may not be switched on until the booth is in operation. If the booth stops, the powder coating device must switch off too.

The control units for the spray guns must be installed and used in zone 22. Spray guns are allowed in zone 21.

Only original Gema OEM parts are guaranteed to maintain the explosion protection rating. If damages occur by using spare parts from other manufacturers, the warranty or compensation claim is void!

Conditions leading to dangerous levels of dust concentration in the powder spraying booths or in the powder spraying areas must be avoided. There must be sufficient technical ventilation available, to prevent a dust concentration of more than 50% of the lower explosion limit (UEG = max. permissible powder/air concentration). If the UEG is not known, then a value of 10 g/m³ should be considered (see EN 50177).

All unauthorized conversions and modifications to the electrostatic spraying equipment are forbidden for safety reasons.

No safety devices should be dismantled or put out of operation.

Mandatory operational and workplace notices from the operating company must be written in a comprehensible manner in the language of equipment operators and posted in a suitable place.
Powder lying on the floor around the powder spraying equipment is a potentially dangerous source of slipping. Booths may be entered only in the places suitable for it.

**Static charges**

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Proper grounding must be in place to prevent objects from becoming charged.

**Grounding**

All electrically conductive parts found in the workplace of 5 meters around each booth opening, and particularly the objects to be coated, have to be grounded. The grounding resistance of each object must amount to maximally 1 MOhm. This resistance must be checked/tested regularly when starting work.

The condition of the work piece attachments, as well as the hangers, must guarantee that the work pieces remain grounded. The appropriate measuring devices must be kept ready in the workplace, in order to check the grounding.

The floor of the coating area must conduct electricity (normal concrete is generally conductive).

The supplied grounding cable (green/yellow) must be connected to the grounding screw of the fresh powder system. The grounding cable must have a good metallic connection with the coating booth, the recovery unit and the conveyor chain, respectively with the suspension arrangement of the objects.

Smoking and igniting fire are forbidden in the entire vicinity of the system! No work that could potentially produce sparks is allowed!
As a general rule for all powder spraying installations, persons with pacemakers should never enter high voltage areas or areas with electromagnetic fields. Persons with pacemakers should not enter areas with powder spraying installations!

Photographing with flashlight can lead to unnecessary releases and/or disconnections by safety devices.

Disconnect the plugs before the machines are opened for maintenance or repair.

The plug connections between the powder spraying equipment and the mains should only be removed when the power supply is switched off.

As far as it is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).

A dust mask corresponding to filter class FFP2 or N95 at minimum must be worn during any cleaning work.

The operating personnel must wear electrically conductive, steel-toe footwear (e.g. leather soles).

The operating personnel should hold the gun with bare hands. If gloves are worn, these must also conduct electricity.

These general safety regulations must be read and understood in all cases prior to start-up!
Intended use

1. The OptiFlex 2 V Fresh powder system is state of the art equipment that conforms to the recognized technical safety regulations and is designed for normal powder coating applications.

2. Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If the OptiFlex 2 V is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.

3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The OptiFlex 2 V should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the OptiFlex 2 V has been set up and wired according to the guidelines for machinery (2006/42 EG). EN 60204-1 (machine safety) must also be observed.

5. Unauthorized modifications to the OptiFlex 2 V fresh powder system exempt the manufacturer from any liability from resulting damage.

6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.

7. Furthermore, the country-specific safety regulations also must be observed.

Product-specific safety measures

- The installation work to be done by the customer must be carried out according to local regulations.
- It must be ensured, that all components are earthed according to the local regulations before start-up.

OptiFlex 2 V Fresh powder system

The OptiFlex 2 V fresh powder system is a constituent part of the equipment and is therefore integrated in the system’s safety concept.

If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.

NOTE:
For further information, see the more detailed Gema safety regulations.
About this manual

General information

This operating manual contains all important information which you require for the working with the OptiFlex 2 V Fresh powder system. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the function mode of the individual system components – booth, gun control unit, manual gun or powder injector – can be found in the supplied documents.

NOTE:
These operating instructions describe all the features and functions of the fresh powder system that were available at the time this operating instructions went to press.
Please note that your fresh powder system may not be equipped with all described functions.
Product description

Field of application

The OptiFeed 2 V Fresh powder system (with powder box) is exclusively intended for electrostatic coating using organic powders (For more on this please also review chapter "Technical Data").

Any other use is considered non-compliant. The manufacturer is not responsible for any incorrect use and the risks associated with such actions are assumed by the user alone!

For a better understanding of the interrelationships in powder coating, it is recommended that the operating instructions for all other components be read as well, so as to be familiar with their functions too.

Utilization

The fresh powder system is ideally suited for the powder supply for one or two manual or automatic powder guns with synthetic fresh powder directly from the powder container. The powder will be vibrated in its container and directly sucked up by the fluidizing/suction unit.
Reasonably foreseeable misuse

- Operation without the proper training
- Use with insufficient compressed air quality and grounding
- Use in connection with unauthorized coating devices or components

Technical Data

Powder output (reference values)

*General conditions for the OptiFlow Injector*

<table>
<thead>
<tr>
<th>Powder type</th>
<th>Epoxy/polyester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of powder hose (m)</td>
<td>6</td>
</tr>
<tr>
<td>Powder hose Ø (mm)</td>
<td>10</td>
</tr>
<tr>
<td>Type of powder hose</td>
<td>POE with guide strips</td>
</tr>
<tr>
<td>Input pressure (bar)</td>
<td>5.5</td>
</tr>
<tr>
<td>Conveying air nozzle (mm)</td>
<td>1.6</td>
</tr>
<tr>
<td>Correction value C0</td>
<td>Powder output zeroing adjustment</td>
</tr>
</tbody>
</table>

Guide values for OptiStar with OptiFlow Injector IG06

All values in these tables are guide values. Differing environmental conditions, wear and different powder types can affect the table values.

<table>
<thead>
<tr>
<th>Total air</th>
<th>3 Nm³/h</th>
<th>4 Nm³/h</th>
<th>5 Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder output (%)</td>
<td>20</td>
<td>85</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>150</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>210</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>270</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>300</td>
<td>360</td>
</tr>
</tbody>
</table>

Air flow rates

<table>
<thead>
<tr>
<th>OptiFlex 2 V</th>
<th>Range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate – fluidizing air:</td>
<td>0-1.0 Nm³/h</td>
<td>0.1 Nm³/h</td>
</tr>
</tbody>
</table>
# Electrical data

<table>
<thead>
<tr>
<th>OptiFlex 2 V</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vibrator connection and performance</strong></td>
<td>110/230 VAC: max. 100 W</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50-60 Hz</td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>0 °C - +40 °C (+32 °F - +104 °F)</td>
</tr>
<tr>
<td><strong>Max. surface temperature</strong></td>
<td>120 °C (+248 °F)</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td>Ex II 3 D IP54 120 °C</td>
</tr>
</tbody>
</table>

# Dimensions

<table>
<thead>
<tr>
<th>OptiFlex 2 V</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width</strong></td>
<td>460 mm</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>862 mm</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>900 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>32 kg</td>
</tr>
</tbody>
</table>

# Processible powders

<table>
<thead>
<tr>
<th>OptiFlex 2 V</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plastic powder</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Metallic powder</strong></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Enamel powder</strong></td>
<td>no</td>
</tr>
</tbody>
</table>
Design and function

Overall view

OptiFlex 2 V Fresh powder system – Structure

1 OptiFlow injector
2 Swivel arm with guide sleeve
3 Fluidizing/suction unit
4 Vibrating table
5 Swivel wheel
6 Rubber wheel
7 Frame
8 Hose holder

OptiFlow injector

All information about the OptiFlow injector will be found in the corresponding enclosed documentation!

Scope of delivery

OptiFlex 2 V

- Mobile frame with hose holder
- vibrating base and a fluidizing/suction unit
- plug-in OptiFlow injector
- Pneumatic hoses for conveying air (red), supplementary air (black) and fluidizing air (black)
- Operating manual
- Short description
Optional accessories for OptiFlex 2 V
- A second fluidizing/suction unit with plug-in OptiFlow injector, double arm, pneumatic kit and screw joints
- Pneumatic hoses for conveying air (red) and fluidizing air (black)

Typical characteristics – properties of the functions

Processing the powder directly from the original powder manufacturer's container

The OptiFlex 2 V fresh powder system allows for powder to be processed directly out of the original powder manufacturer's container. A titled vibrating floor has been included to ensure that the powder container empties itself completely.
Start-up

Preparation for start-up

Basic conditions

When starting up the OptiFlex 2 V Fresh powder system, the following general conditions impacting the coating results must be taken into consideration:

- fresh powder system is set up properly
- corresponding power supply available
- device grounded properly
- Powder preparation and powder quality

Set-up

The OptiFlex 2 V fresh powder system should always be set up vertically on a flat surface.

WARNING:
The fresh powder system must not under any circumstances be set up near a heat source (such as an enameling furnace) or an electromagnetic source (such as a control cabinet).
Assembly guide

The OptiFlex 2 V fresh powder system must be set up in accordance with the following setup and connecting instructions.

OptiFlex 2 V Fresh powder system
Note:
Use clamp to connect grounding cable to the cabin or the suspension arrangement. Check ground connections with Ohm meter and ensure 1 MOhm or less

Note:
The compressed air must be free of oil and water!
Initial start-up

Note:
If a malfunction occurs, see section "Troubleshooting".

Grounding
Power/tension/supply

1. [Grounding symbol]

2. [Pressure gauge] 5,5 bar

3. [Voltage symbol] 110 V/230 V

4. [Power switch] on
Operation

Coating

WARNING:
If the fresh powder system is not being used for coating in conjunction with a sufficiently powerful suction unit, then the stirred-up dust from the coating powder can cause respiratory issues or cause a slippage/falling hazard.

- The fresh powder system may only be operated in conjunction with a sufficiently powerful suction unit (such as Gema Classic Open booth).

1. Switch on the vibrator
2. Swivel aside the fluidizing/suction unit
3. Place the open powder container on the vibrating table

WARNING:
If a container is placed on the vibrating plate, then fingers caught in the gap between the two plates can be crushed.

- The container may weight a max. of 30 kg.

4. Place the fluidizing/suction unit onto the powder
5. Setting the fluidization = guide value 0.1 Nm³/h
   a) Check the powder fluidization in the powder container. The powder fluidization in the powder containers depends on the powder characteristic, the humidity and the ambient air temperature. Fluidizing and vibration start by switching on the control unit.

WARNING:
If the fluidization has been incorrectly adjusted, then the coating powder can create a dust cloud capable of causing respiratory problems.

- Adjust the fluidization correctly
Color change

General information

When a color change takes place, the individual components of the fresh powder system must be cleaned carefully. All powder particles of the former color must be removed during this process!

The following describes an 'extreme' color change (light to dark).
Initial start-up OptiFlex 2 V
Shutdown

1. Switch off the vibrator

*If in disuse for several days*

1. Separate from power mains
2. Clean the coating equipment (see the corresponding operating manual)
3. Turn off the compressed air main supply
Cleaning and maintenance

Note:
Regular and conscientious maintenance increases the service life of the fresh powder system and provides for a longer continuous coating quality!
The parts to be replaced during maintenance work are available as spare parts. These parts can be found in the corresponding spare parts list!

Daily maintenance

1. Clean the injector (see therefore the user manual of the OptiFlow injector)
2. Clean the powder hose; Please also review the section "Color change"

Weekly maintenance

1. Clean the fluidizing/suction unit with compressed air. Place the fluidizing/suction unit back into the powder shortly before restarting operation
2. Check the control unit grounding connections to the coating booth, the suspension devices of the work pieces, or the conveyor chain

If in disuse for several days

1. Separate from power mains
2. Clean the Fresh powder system
3. Turn off the compressed air main supply

Powder hose rinsing
If longer downtimes take place, the powder hose has to be cleaned.

Procedure:
1. Disconnect the powder hose from the hose connection on the injector
2. Blow through the hose manually with a compressed air gun
3. Connect the powder hose again to the hose connection on the injector
Cleaning

WARNING:
If no dust mask or one of an insufficient filter class is worn when cleaning the product, then the dust that is stirred up from the coating powder can cause respiratory problems.
- The ventilation system must be turned on for all cleaning work.
- A dust mask corresponding to filter class FFP2 or N95 at minimum must be worn during any cleaning work.

Cleaning the fluidizing/suction unit

1. Remove the injector
2. Remove the fluidizing/suction unit
3. Clean the fluidizing/suction unit with compressed air. Also blow off the suction tube with compressed air
4. Clean the injector (see therefore the injector user manual)
5. Reassemble the individual parts
# Troubleshooting

## General information

<table>
<thead>
<tr>
<th>Failure</th>
<th>Causes</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>No powder transport or the transport becomes irregular</td>
<td>Compressed air not present</td>
<td>Connect the equipment to the compressed air</td>
</tr>
<tr>
<td></td>
<td>Injector or powder hose clogged</td>
<td>Clean the corresponding part</td>
</tr>
<tr>
<td></td>
<td>Insert sleeve in the injector is worn</td>
<td>Check with the plug gauge and replace, if necessary</td>
</tr>
<tr>
<td></td>
<td>Insert sleeve in the injector is clogged</td>
<td>Clean the corresponding part</td>
</tr>
<tr>
<td></td>
<td>Insert sleeve is not installed</td>
<td>Mount insert sleeve</td>
</tr>
<tr>
<td></td>
<td>Fluidization not running</td>
<td>see below</td>
</tr>
<tr>
<td>The powder is not fluidized</td>
<td>Compressed air not present</td>
<td>Connect the equipment to the compressed air</td>
</tr>
<tr>
<td></td>
<td>Fluidizing air adjustment is set too low</td>
<td>Set the fluidizing air correctly</td>
</tr>
<tr>
<td></td>
<td>Vibrator/condenser broken</td>
<td>Contact local Gema representative</td>
</tr>
<tr>
<td></td>
<td>Vibrator not plugged in</td>
<td>plug in</td>
</tr>
</tbody>
</table>
Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- **Type** OptiFlex 2 V  **Serial number** 1234 5678
- **Order no.** 203 386, 1 piece, Clamp – Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this bulk stock is always marked with an *.

Wearing parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

**ATTENTION!**

Only original Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!
# OptiFlex 2 V fresh powder system – Spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>IG06 injector – complete (see corresponding user manual)</td>
<td>1007 780</td>
</tr>
<tr>
<td>4</td>
<td>Pneumatic connection for conveying air – complete (incl. Pos. 4.1, 4.2, 4.3)</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Quick release connection – NW5, Ø 8 mm, red</td>
<td>261 645</td>
</tr>
<tr>
<td>4.2</td>
<td>Nut with kink protection – M12x1 mm, Ø 8 mm</td>
<td>201 316</td>
</tr>
<tr>
<td>4.3</td>
<td>Plastic tube – Ø 8/6 mm, red</td>
<td>103 500*</td>
</tr>
<tr>
<td>5</td>
<td>Pneumatic connection for supplementary air – complete (incl. Pos. 5.1, 5.2 and 5.3)</td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Quick release connection – NW5, Ø 8 mm, black</td>
<td>261 637</td>
</tr>
<tr>
<td>5.2</td>
<td>Nut with kink protection – M12x1 mm, Ø 8 mm</td>
<td>201 316</td>
</tr>
<tr>
<td>5.3</td>
<td>Plastic tube – Ø 8/6 mm, black</td>
<td>1008 038*</td>
</tr>
<tr>
<td>8</td>
<td>Fluidizing/suction unit – complete</td>
<td>1007 509</td>
</tr>
<tr>
<td>9</td>
<td>Pneumatic connection for Fluidizing air – complete (incl. pos. 9.1, 9.2 and 9.3)</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Quick release connection – NW5, Ø 6 mm</td>
<td>200 840</td>
</tr>
<tr>
<td>9.2</td>
<td>Nut with kink protection – M10x1 mm, Ø 6 mm</td>
<td>201 308</td>
</tr>
<tr>
<td>9.3</td>
<td>Plastic tube – Ø 6/4 mm, black</td>
<td>1001 973</td>
</tr>
<tr>
<td>12</td>
<td>Rubber damper – Ø 20x25 mm, M6/2 mm</td>
<td>246 000</td>
</tr>
<tr>
<td>13</td>
<td>Hexagon shakeproof nut – M6</td>
<td>244 430</td>
</tr>
<tr>
<td>14</td>
<td>Powder hose – Ø 15/10 mm, 6 m</td>
<td>1001 673*#</td>
</tr>
<tr>
<td>15</td>
<td>Short description</td>
<td>1007 143</td>
</tr>
<tr>
<td>16</td>
<td>Operating manual</td>
<td></td>
</tr>
</tbody>
</table>

* Please indicate length

# Wearing part
OptiFlex 2 V fresh powder system – Spare parts list

OptiFlex 2 V fresh powder system – Spare parts