



**Flame Spraying System**  
*MINISPRAYJET*  
*F 311 FX*

Superflash Compressed Gas Equipment / IBEDA Inc.  
28825 Ranney Parkway, Westlake, OH 44145 Phone 1+440-716-9960 Fax 1+440-871-9964  
E-Mail: [sales@oxyfuelsafety.com](mailto:sales@oxyfuelsafety.com) – Internet: [www.oxyfuelsafety.com](http://www.oxyfuelsafety.com)

*MiniSprayJet F311 FX*



## Contents

### Description

<b>Description of the Flame Spraying System IBEDA MINISPRAYJET F 311 FX</b> .....	<b>6</b>
1. IBEDA powder flamespraying gun MINISPRAYJET F 311 FX:.....	6
2. IBEDA MINISPRAYJET F 311 FX - Powder-Feeder-System.....	7
3. The powder feeding pump.....	8
<b>Remarks for the user</b> .....	<b>9</b>
Technical knowledge and education of the user .....	9
Personal protection equipment.....	9
Transport, .....	9
<b>Safety information</b> .....	<b>9</b>
<b>Usage</b> .....	<b>10</b>
Intended usage.....	10
IBEDAPlast – Application range.....	10
Non intended usage: .....	10
<b>Safety instructions</b> .....	<b>11</b>
<b>Instructions</b> .....	<b>12</b>
<b>I. Installation and connection of the IBEDA MINISPRAYJET F 311 FX</b>	
<b>Powder-Feeder-System</b> .....	<b>13</b>
Commissioning.....	13
Powder feed from container .....	13
Function of control unit. ....	14
Adjustment of Fluidization .....	15
Adjustment of Fluidization air of powder cloud.....	15
Adjusting of the powder quantity .....	15
Adjusting of the powder feeding rate.....	15
<b>II. Installation and connection tubings for IBEDA MINISPRAYJET F 311 FX</b>	
<b>Flame Spraying Gun</b> .....	<b>16</b>
Start up:.....	16
Connection of Gun to Fuel gas and Oxygen.....	16
Connection of gun to cooling gas.....	16
<b>III. Adjusting Parameter of Flame Spraying System for Operation</b>	
<b>IBEDA MINISPRAYJET F 311 FX</b> .....	<b>17</b>
<b>IV. Coating with the IBEDA MINISPRAYJET F 311 FX</b> .....	<b>18</b>
<b>Using Plastic Powders ( IBEDA-Thermoplastics)</b> .....	<b>18</b>
<b>Maintenance and Cleaning</b> .....	<b>19</b>
Daily maintenance.....	19
Weekly maintenance .....	20
<b>Taking out of operation:</b> .....	<b>21</b>
<b>Maintenance</b> .....	<b>21</b>
<b>Avoiding of disturbances</b> .....	<b>21</b>
<b>Disassembly, erection and disposal</b> .....	<b>21</b>

*MiniSprayJet F311 FX*



*MiniSprayJet F311 FX*



### Description of the Flame Spraying System IBEDA MINISPRAYJET F 311 FX

The flame spraying system IBEDA MINISPRAYJET F 311 FX consists out of the following three main parts and accessories

1. IBEDA powder flame spraying gun MINISPRAYJET F 311 FX
2. IBEDA MINISPRAYJET F 311 FX - Powder-Feeder-System
3. Powder feeding pump
4. Options for the flame spraying system IBEDA MINISPRAYJET F 311 FX :
  - 4.1 Powder hose , 5 m complete
  - 4.2 Regulator for compressed air
  - 4.3 Hose for compressed air 6m complete
  - 4.4 Hose for fuel gas and oxygen 6 m complete
  - 4.5 Manual slide valve for cooling gas
  - 4.6 Regulator for oxygen 1 stage
  - 4.7 Regulator for oxygen 2 stages
  - 4.8 Flashback arrestor for fuel gas
  - 4.9 Flashback arrestor for oxygen

#### 1. IBEDA powder flamespraying gun MINISPRAYJET F 311 FX:

The body of the gun is made of a light aluminum alloy.  
On the rear side it has four connections::

1. Connection for fuel gas R 3/8" LH
2. Connection for oxygen R 1/4" RH
3. Connection for cooling gas R 1/8" RH (standard cooling gas compressed air)
4. Connection for powder R 1/8" RH

The flame spraying gun is made to use with **propane and oxygen**.

To avoid flashbacks the gun is equipped with a special injector type nozzle for propane and oxygen.

The construction of the nozzle guarantees that the cooling gas separates the powder flow from the Propane-oxygen flame. This avoids an overheating of the nozzle and that the powder will be burned by the flame during usage.

The powder flow can be turned on and off by a lever integrated in the handle of the gun.

The IBEDA powder flame spraying gun MINISPRAYJET F 311 FX is easy to use and maintain.

The IBEDA powder flame spraying gun MINISPRAYJET F 311 FX is constructed according to the DIN 8543 and complies with the UW VGB 15 19 Abs. 1 " Cutting, welding and related operations".

## **2. IBEDA MINISPRAYJET F 311 FX - Powder-Feeder-System**

The powder feeding system is constructed for working direct from the original powder container. It consists of a mobile electro-pneumatic control unit with vibrating table and suction device.

The powder feeding pump pops directly into the original powder container and transports the powder through the powder hose tot he gun.

The feeding rate accords to the adjusted feeding gas pressure (compressed air).

1. Control valve and gauge for the fluidizing function  
(Symbol-Turbulence sinter bath)
2. Control valve and gauge for the powder feeding pump and for the gun.  
(Symbol-Gun )
4. Electrical main switch with control light
5. Electrical switch for the gun  
(Magnetic valve to open and close feeding gas) (Symbol-gun )

The different compressed air hoses are connected to the control unit by quick couplings.

The IBEDA *MINISPRAYJET F 311 FX* Powder-Feeder-System is as standard equipped with a powder feeding pump.

### **3. The powder feeding pump.**

The pump is working according to the injector principle.

The elements off the pump like pressure and mixing nozzles are made of brass.  
The body is made off an aluminium alloy.

How it works:

The powder suction device is fixed on a carrier and is fed in the powder container.

The powder pump transports the powder to the flame spraying gun *MINISPRAYJET F311FX*.  
During feeding the powder the vibrating table has to be always in action.

The pressure of the feeding gas has to be adjusted with the valve showing the symbol of the spraying gun.

When the lever on the gun is pushed the flows to the gun.

The quantity of powder can be controlled by:

1. By increasing or reducing of the powder feeding pressure.
2. At a standard feeding gas pressure of 6 bar the feedrate is approx. 10kg/h.



## Remarks for the user

### Technical knowledge and education of the user

work equipment are only to be used by people over the age of 18, who are physically qualified, have required knowledge and were instructed by a qualified person. Documented training instruction is recommended to be done at periodical intervals, at least once a year.

### Personal protection equipment

The necessary personal protection equipment has to be used. Additional security arrangements may be anticipated according to requirements.


Users guide for dangerous goods has to be considered.

### Transport,

Transport and handling has to be done carefully by qualified staff with appropriate equipment. Storage of work equipment (temporary storage) have to be at a temperature of +5°C to +35°C and have to be kept free from dust and moisture.

Please check the goods for transport damage upon receipt. It is not approved for use with damaged components.

## Safety information

All safety instructions are marked with this sign .

Without permission of the producer it is not allowed to make any changing on the flame spraying system IBEDA MINISPRAYJET F 311 FX.

If it's done without a permission there will be danger for the user or other persons nearby.

Formatted: Body Text,Datenblätter Pulver

## Usage

### Intended usage

The IBEDA powder flame spraying gun MINISPRAYJET F311 FX F is to be used with plastic powders made for the thermal spray process.

IBEDAPlast is a perfect long-time corrosion wear for any noncorrosive metals. It's saltwater resistance causes a large application spectrum for installation works which encounters saltwater. It may also be used for decorative reasons because of the huge variety of colours. IBEDAPlast is absolutely not dangerous for health and can be used for coatings in food industry.

### IBEDAPlast – Colours overview

Name of Powder/Colour	IBEDA-Purchase Order No.
Plastic Spray Powder-PPA571110 white	7760-0017
Plastic Spray Powder -PPA571700 black	7760-0018
Plastic Spray Powder -PPA571613 grey	7760-0019
Plastic Spray Powder -PPA571344 yellow	7760-0020
Plastic Spray Powder -PPA571475 green	7760-0021
Plastic Spray Powder -PPA571233 red	7760-0022
Plastic Spray Powder -PPA571536 blue	7760-0023
Plastic Spray Powder -PPA571838 brown	7760-0024

(Other colours on request)

(Minimum quantity 20 kg bunch)

### IBEDAPlast – Application range

IBEDA Name	Alloying component	Hardness Shore A	Application
IBEDAPlast	Ethylene-Vinyl acetate Copolymer	95	- Roadworks - Steel construction work - Chemical industry - Fresh water- and waste water treatment - Food industry

### Non intended usage:

Any usage not according to this manual or with other pressures gas quantities or temperatures is a non intended usage.

## Safety instructions

This flame spray unit conforms to the latest state-of-the-art technology and the requirements of the established standards and regulations.

Refrain from every mode of operation that affects the safety of the flame spray unit. The operating company must ensure that the flame spray unit is only operated in a proper and sound condition.

No modifications to or rebuilding may be carried out without permission from the manufacturer.



Risk of explosion: All components on the flame spray systems are to be kept free of oil, grease and other contaminants..

- Do not wear clothing that has been contaminated with oil or grease. Be sure your hands are clean. Do not use ointments or gels.
- After spending time in an oxygen-enriched atmosphere clothing must be carefully aired out because the oxygen can cling very well there. A source of ignition could cause clothing to catch fire.
- No access to flame spray systems with open flame and fire. Do not smoke where there is a suspected excess of an oxygen/industrial gas
- Ensure that the room is well-ventilated.
- No access for unauthorised persons!

## Instructions

Please follow the local national instructions, standards and laws (for Germany as following):

98/37/EG  
97/ 23/ EG  
Directive 73/ 23/ EWG  
89/336/EWG

Machinery Directive  
Pressure Equipment Directive  
Low Voltage Directive  
Electromagnetic compatibility

## BGVR

(German Employers' Liability Insurance Association Rules and Regulations)

BGR 500 Chap.2.26  
BGR 500 Chap.2.31  
BGR 500 Chap.2.32  
BGR 500 Chap.2.33

Welding, cutting and related processes  
Working on gas lines  
Operation of oxygen systems  
Gases

## Standards

EN 559  
EN 560  
EN 561  
EN 562  
EN 730-1  
EN 954 Teil 1  
EN ISO 2503  
EN ISO 12100  
EN ISO 14114  
DIN EN ISO 5172  
DIN EN 657  
DIN EN 13214  
DIN EN 13214  
DIN EN 14616  
DIN EN 1395  
DIN ISO 9090  
DIN ISO 9539  
VDE 0113 / EN 60204

Rubber hoses  
Hose connections  
Quick-action couplings  
Pressure gauge  
Safety devices  
Safety related parts of control systems  
Pressure regulator  
Machine safety  
Acetylene cylinders - Manifolds  
Burner for welding, warming and cutting  
Thermal spraying - Terminology, classification  
Thermal spraying - Coordination Tasks and Responsibilities  
Thermal spraying - Coordination Tasks and Responsibilities  
Thermal spraying - Recommendations for thermal spraying  
Approval test for thermal spraying plants  
Gas proofness  
Materials  
Safety of machinery – Electrical equipment of machines, part 1: Specification for general requirements

## Laws

GPSG  
BetrSichV  
GefStoffV  
BImSchG

Product Safety Act  
Health and Safety at Work Regulations  
Ordinance of Hazardous Substances  
German Federal Emissions Protection Law

## Technical regulations

TRAC 204,206,207,401,402  
TRG  
TRF  
DVS-Data-Sheet

Technical regulations for acetylene and calcium carbide systems  
Technical regulations pressure gases  
Technical regulations liquid gases  
DVS 0221, DVS 2307, DVS 2314, DVS M 2304 etc.

Formatted: Font: 10 pt, Bold, English (United Kingdom)

## I. Installation and connection of the IBEDA *MiniSprayJet F 311 FX* Powder-Feeder-System

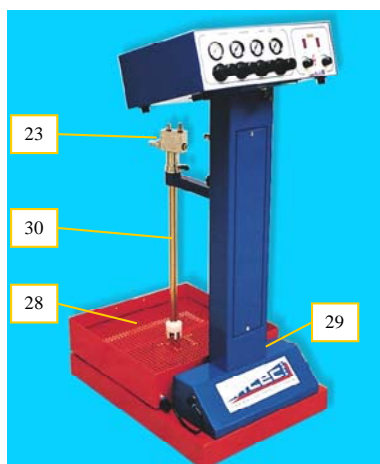
The IBEDA *MINISPRAYJET F 311 FX* Powder-Feeder-System complete, consists of:

- 1 Piece carriage system F 311 FX-S with electro-pneumatic control system, power supply, mounted hoses for compressed air, vibrating table.
- 1 Piece venting hose with 90 ° connector
- 1 Piece earth cable
- 1 Piece powder pump incl. hose and connection

### Commissioning

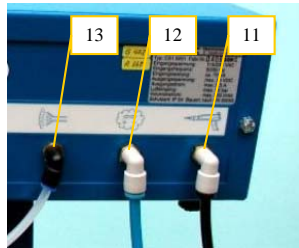
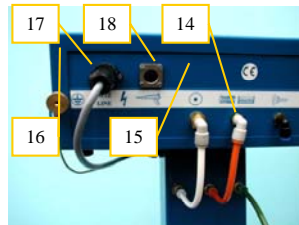
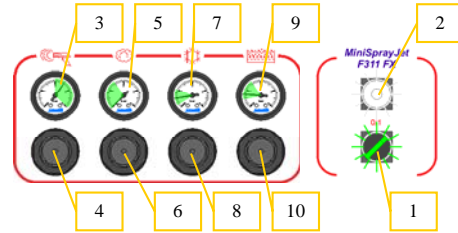
#### Powder feed from container

- vibrating table (28) placed on the carriage system (29)
  - Powder container (27) placed on the vibrating table.
  - Powder suction device (30) fixed on the carriage system (29) with powder suction lance (30) put in the powder-container(27).
  - Powder injector (23) connected to the feeding (black) and control air (blue)
  - The sideways situated fluid air connection (green) connected with the control unit.
  - The control of the fluid air is done with the integrated impendence (32)
  - Powder quantity is adjusted by activated powder lever on the gun.
- Connect all compressed air hoses to the pipeline system or bottles and the plug to 220 V / 50 Hz (110 V / 50Hz).



**Function of control unit.**

- 1 Switch ON/Off
- 2 Control lamp
- 3 Gauge for Control-air.
- 4 Regulator for Control-air.
- 5 Gauge for regulating-air
- 6 Regulator for regulating-air
- 7 Gauge for Atomizing-air
- 8 Regulator for Atomizing Air
- 9 Gauge for Fluidization-air
- 10 Regulator for Fluidization-air
- 11 Feeding Air
- 12 Control Air
- 13 Atomizing Air
- 14 Fluidization Air
- 15 Air Connection
- 16 Earth Terminal
- 17 Power Connection
- 18 Gun Connection



### Adjustment of Fluidization



The adjustment of air supply of vibrating table and fluid bottom is made on regulator **10** (fluid air), the adjusted pressure is visible on gauge **9**.

For adjusting the interlock at the regulator has to be released by pulling the adjustment button of the regulator. After adjustment of compressed air the regulator button has to be pushed in front panel direction and locked.

#### Feeding out of a Container

Connect fluid-air-hose to the vibrating table. Adjust air pressure until the vibrating table with container on starts vibrating slightly. The correct value has to be found in praxis. To strong vibration can densify the powder inside the container and the feeding becomes irregular. The fluidization of the suction unit is adjusted with the restrictor installed sidewise on the carriage.

### Adjustment of Fluidization air of powder cloud



The adjustment of the atomizing air of the flame spraying gun *MINISPRAYJET F311 FX* is made on regulator **8**, the adjusted pressure is visible on gauge **7**.

For adjusting the interlock of the regulator has to be released by pulling the adjustment button of the regulator. After adjustment of compressed air the regulator button has to be pushed in front panel direction and locked.

Here applies: High pressure causes higher air portion within powder cloud and respective velocity.

Recommended initial value: approx. 1,0 bar

### Adjusting of the powder quantity



The adjusting of the powder quantity is done by the control valve **6**, the adjusted pressure is shown on the gauge **5**.

Remark: high pressure causes a higher feeding velocity by a smaller quantity.

The recommended start pressure is 0.5 bar

### Adjusting of the powder feeding rate

The adjusting of the powder feeding is done by control valve **4** the adjusted pressure is shown on gauge **3**.



Function:

High pressure = huge powder quantity

Low pressure = low powder quantity

The recommended start pressure is approx. 1.5 bar

## II. Installation and connection tubings for IBEDA *MINISPRAYJET F 311 FX* Flame Spraying Gun

The IBEDA MINISPRAYJET F 311 FX operates with following gas combinations:

Propane - Oxygen – Compressed Air ( Spraying nozzle Type: MSJ - L/T (P) necessary)

The spraying gun IBEDA MINISPRAYJET F 311 FX has following connection threads:

- Fuel gases = (Propane)  
Symbol: " Pn " yellow : R 3/8" left hand male
- Oxygen  
Symbol: " O " blue: R 1/4" right hand male
- Cooling gas  
Symbol: " ext.G " : R 1/8" right hand male
- for external powder feeding (Thermoplastic powder u. transportation gas)  
Symbol : " ext.P " : R 1/8" right hand male

### Start up:

#### Connection of Gun to Fuel gas and Oxygen

- Use of special hose package.
- Cylinder armatures:  
Propane  
Oxygen  
With using safety armatures and devices for fuel gas and oxygen

The a.m. mentioned safety armatures have to be screwed on free of leakage on following the hoses for propane and oxygen have to be connected.

- Connection at gun on back side as per markings:

(„Pn " = Propane  
„O " = Oxygen)

- Leakage test to be done.

#### Connection of gun to cooling gas (Compressed air)

The compressed air armature has to be connected to a supply tubing system.

Connection thread R 3/8" right hand male.

- Inlet – middle via diaphragm shut off valve
- Outlet – left and right
- Outlet "left" – Installation of compressed air hose
- Connection at IBEDA *MINISPRAYJET F 311 FX* an Symbol "ext.G" R 1/8"right to the air slide valve.

After basic adjustment of IBEDA *MINISPRAYJET F 311 FX* powder hose of Powder Feeder System is connected to the right outlet of the compressed air supply and then connected to the gun symbol "ext.P"..

(Powder hose with hose pins nuts R 3/8" RH and R 1/8" RH 5.0 m. long

Formatted: Font: 9 pt, English (United Kingdom)

Formatted: Font: 9 pt, English (United Kingdom)



### III. Adjusting Parameter of Flame Spraying System for Operation IBEDA MINISPRAYJET F 311 FX

Flame spraying gun on IBEDA *MINISPRAYJET F 311 FX*  
(running with Propane-Oxygen-Compressed-air)

- Spraying nozzle Type F311FX (P)
- Adjusting pressures:
- |                        |   |                |
|------------------------|---|----------------|
| Propane                | : | 1.2 BAR        |
| Oxygen:                |   | 2,5 BAR        |
| (Flame adjustment)::   |   | neutral        |
| (Cooling gas pressure) |   | (max. 3,0 BAR) |

#### Remark

The exchange of the spraying nozzle has to be done as follows:

1. Before removing the spraying nozzle the whole system has to be switched off. This means the working gas supplies and feeding gas supplies have to be shut and the electric main switch has to be turned off.
2. Screw of the screw sleeve from the gun by turning left. The spraying nozzle adapter with spraying nozzle is taken off from gun body. Loosen nozzle-pressing screws SW 24 – Fix nozzle adapter with a monkey key on the spanning device. Prior to installing the new spraying nozzle all sealing surfaces of the nozzle adapter have to be free for powder residues. The assembly is done analogue to the removing. Before pushing in the nozzle adaptor with nozzle pressing screws it has to be checked that all O-rings on the index sleeves don't have any mechanical damages. If necessary they have to be exchanged. The connection area between gun body and nozzle adaptor has to be cleaned carefully and in order to obtain absolute leakage tightness.

#### **ATTENTION VERY IMPORTANT !!!**

The spraying nozzle adaptor has to be pushed in the gun body until block before the screw sleeve is fixed.

#### IBEDA *MINISPRAYJET F 311 FX* Powder-Feeder-System

- Adjusting parameters:
- |                              |                       |
|------------------------------|-----------------------|
| Fluid air:                   | 1,0 - 2,0 BAR         |
| Powder feeding gas:<br>(gun) | 4,0 BAR<br>(STANDARD) |

#### **IV. Coating with the IBEDA *MINISPRAYJET F 311 FX* Using Plastic Powders ( IBEDA-Thermoplastics)**

After correct installation, adjustment of the system IBEDA *MINISPRAYJET F 311 FX* coating is done best as follows.:

- Correct preparation of the surface of the parts to be coated by degreasing and succeeding blasting.
- local preheating of the base material in accordance to the powder used.  
80 °C - 180 °C.
- Flame adjustment at gun (neutral)
- First open valve „O“ and than valve „Pn“
- Open manual-slide-valve for cooling gas – slide in forward direction.
- Spraying distance : > 200 mm -(max. 300 mm)
- Press move lever at gun backwards and spraying cycle starts.
- Maintain the gun in constant distance and with constant speed over the surface to be coated in order to receive a homogeneous, melted plastic coating.

### Maintenance and Cleaning



#### Advice

Maintain regularly and faithfully. This rises durability of the system and causes a constant quality!



The unit has to be protect against damage. (regular visual controls)  
Prior to any maintenance work at the powder unit the control unit has to be switched off.

### Daily maintenance



Disconnect Hose junction from powder injector



Pull injector from sucking unit.



Clean injector by using compressed air gun.



Clean powder hose with compressed air..





Check single part for abrasion.  
↳ *Change damaged single part.*

Clean your gun.

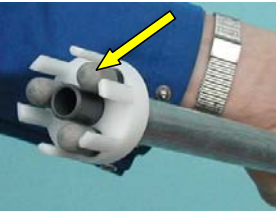
### Weekly maintenance



Remove sucking unit.



Clean sucking unit from both sides with compressed air.



Check fluid nipples for damage.  
↳ *Change damaged fluid nipples.*

**Control Unit:**

For controlling the pneumatic connections the drawer can be taken out of the housing. For doing this the connections at the back side have to be loosened, the earthing screw and the screw M6 have to be removed. Only authorised staff is allowed to open the electric control unit inside the housing.

**Taking out of operation:**

**Switching off or interruption of spraying cycle.**

The powder feeding can be interrupted by pushing the trigger in forward direction. By pulling the slide of the slide valve the cooling gas supply is interrupted. With "turning right" of the slide "Pn" valve (fuel gas control and shut off valve until lock the fuel gas supply is interrupted and the flame extinguishes..

Now the „O“-valve („O“ = Oxygen control and shut off valve) is closed.

**Maintenance**

Only skilled persons or the manufacturer is allowed to do any repairs.

Only with using original spare parts the safe and correct working is guaranteed.

Any arbitrary repairs or modifications done by the user or third parties there is no liability of the manufacturer.

**Avoiding of disturbances**

- Read instructions carefully.
- Check fuel gas and oxygen connections for any leakage.
- Exchange defective O-rings at the gun..
- Don't use damaged spraying nozzles.
- For cleaning the spraying nozzles only the supplied cleaning needles shall be used.

**Disassembly, erection and disposal**

The advises of the manufacturer and the local environmental regulations have to be followed when disposing powders and cleaning materials.

Formatted: Font: 10 pt, English (United Kingdom), Highlight



**Legal notice**

All rights reserved.

## *MiniSprayJet F311 FX*

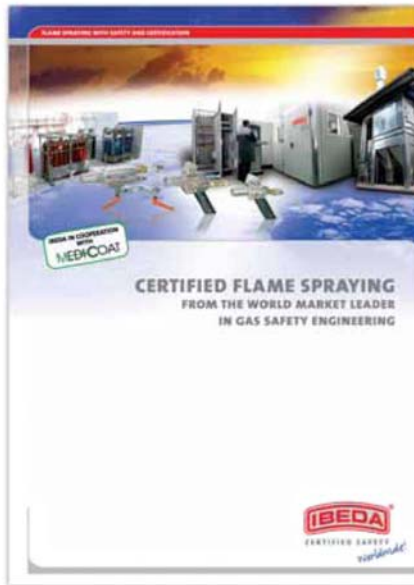
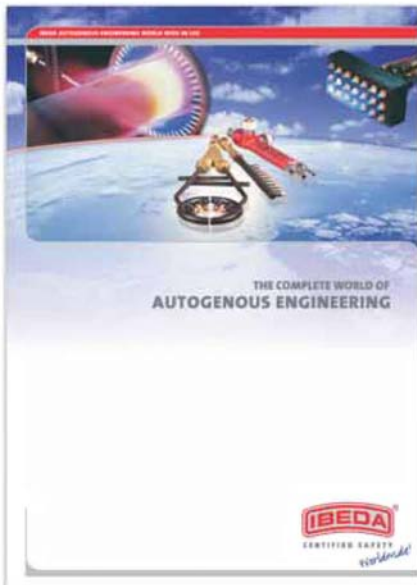
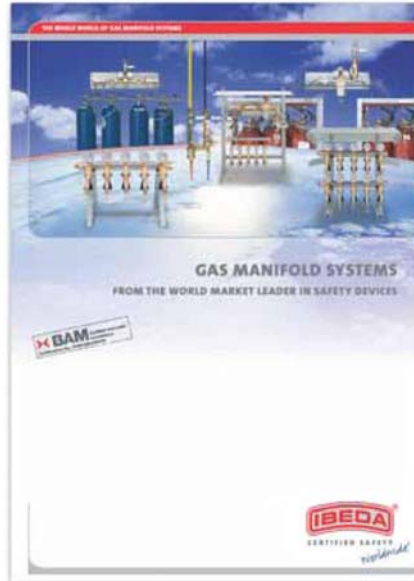
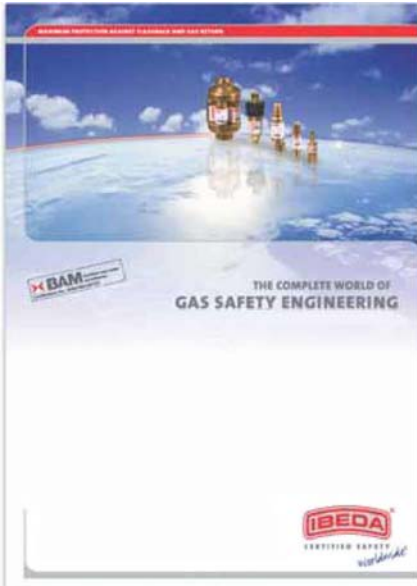


Reprinting is not permitted, including extracts. No part of this user manual may be reproduced in any form, or processed, republished or distributed using electronic systems in any form (photocopy, microfilm or any other process) without written approval from IBEDA Sicherheitsgeräte und Gastechnik GmbH & Co. KG.



*MiniSprayJet F311 FX*





For further information about our program Gas Safety engineering, Gas Manifold Systems, Autogenous engineering and Flame Spraying please don't hesitate to contact your local IBEDA agent or alternatively contact us directly. IBEDA Videos "Gas Safety Device", "Safety Device ATEX", "PV-GD testing unit" as well as "resettable Flashback arrestors DS1000/DS2000 are also available.