



Products for the solar industry

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Table of content

| Product overvie | w solar fluxes |
|-----------------|----------------|
| | |
| Solar fluxes | |
| Cleaning agents | |
| | |
| Contact | |

DO YOU HAVE ANY QUESTIONS ABOUT OUR PRODUCTS? WE WILL BE HAPPY TO ADVISE YOU UNDER: +49 (6123) 7046 - 0



.....47 – 131416





Product overview solar fluxes:

| Solar Flux | E0-S-001 | E0-S-002 | E0-S-007 | E0-S-008 | E0-S-009 | E0-S-010 |
|-------------------------|------------|-----------|-----------|----------|-----------|-----------|
| Cat.Nr. | 6200 | 6202 | 6207 | 6208 | 6209 | 6210 |
| Carrier material | Alcohol | Alcohol | Alcohol | Alcohol | Alcohol | Alcohol |
| Dangerous good | Yes | Yes | Yes | Yes | Yes | Yes |
| Solid content [wt%] | 1,3 | 2,0 | 2,0 | 2,0 | 1,8 | 1,5 |
| Acid value [mg KOH/g] | 9,5 — 10,5 | 16 – 19 | 15 – 18 | 15 – 18 | 16 — 18 | 11 – 15 |
| Halogen-free | Yes | Yes | Yes | Yes | Yes | Yes |
| Synthetic resin content | No | Very low | Nein | Very low | Very low | Verylow |
| Best activation [°C] | 140 — 130 | 150 – 170 | 110 – 170 | 85 – 120 | 130 – 160 | 130 – 170 |
| ISO 9454 | 2131 | 2231 | 2131 | 2131 | 2231 | 2231 |
| DIN EN 61190-1-1 IEC | ORLO | ORLO | ORLO | ORLO | ORLO | ORLO |
| Concentrate | Yes | Yes | Yes | Yes | Yes | Yes |
| Quick-drying version | Yes | Yes | Yes | Yes | Yes | Yes |
| Low melting (BSA) | No | No | No | Yes | No | No |
| Page | 7 | 7 | 8 | 8 | 9 | 9 |

| E0-S-011 | E0-S-012 | E0-S-013 | E0-S-014 | E0-S-015 | EO-S-016 | E0-S-017 |
|----------------------|-------------------------|-----------|-----------|----------------------|-----------|----------------------|
| 6211 | 6212 | 6213 | 6214 | 6215 | 6216 | 6217 |
| 60 % IPA 40 % H₂O | 85 % H20 15% alcohol | Alcohol | Alcohol | 70 % IPA 30 % H₂O | Alcohol | 75 % IPA 25 % H₂O |
| Yes | No | Yes | Yes | Yes | Yes | Yes |
| 2,0 | 2,0 | 2,0 | 2,1 | 1,8 | 1,9 | 2,0 |
| 16 – 19 | 15 – 19 | 5 – 7 | 13 – 16 | 15 – 18 | 15 – 18 | 18 – 21 |
| Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Very low | Very low | Very low | Very low | No | Very low | Very low |
| 110 – 160 | 110 – 160 | 140 - 180 | 120 – 170 | 130 – 175 | 120 – 170 | 110 — 160 |
| 2231 | 2231 | 1231 | 2231 | 2131 | 2231 | 2231 |
| ORLO | ORLO | RELO | ORLO | ORLO | ORLO | ORLO |
| No | No | Yes | Yes | No | Yes | No |
| No | No | Yes | Yes | No | Yes | No |
| No | No | No | No | No | No | No |
| 10 | 11 | 11 | 12 | 12 | 13 | 13 |

Products for the solar industry

Emil Otto offers a wide portfolio for the soldering of solar modules, tabber and stringer material, as well as the joining of cells. This includes flux, rinsing and cleaning agents.

The fluxes are No Clean products that are formulated halogen-free. All fluxes leave no sticky residues. Process tests with renowned machine builders from the stringer technology sector prove this. Furthermore, the activators are specially designed for the high temperatures required for the production of solar modules without impairing the efficiency of the activators. This also applies to the actual application in particularly sunny and hot regions.

SOLAR FLUX-EO-S-001 Cat.-No. 6200

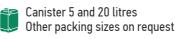
Customer added values:

- Available as concentrate
- · Available as fast-drying variant

Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Technical data:

Appearance/od Solids content: Density 20 °C:

Acid value: Activators/resi

Solvents: Flash point:

SOLAR FLUX-EO-S-002 Cat.-No. 6202

Customer added values:

- Very good soldering properties
- Halogen-free formulation
- No staining and sticky residues · Available as concentrate
- · Available as fast-drying variant

Technical data:

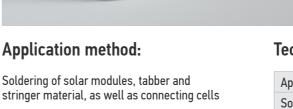
Appearance/odd Solids content: Density 20 °C: Acid value: Activators/resi Solvents: Flash point:



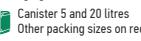








Packaging units:



Application method:

Other packing sizes on request



 Flux for soldering solar modules, tabber and stringer material, as well as the connection of cells Very good wetting properties Very good soldering properties • Halogen-free and resin-/rosin-free • No staining and sticky residues

| our: | colourless, clear liquid |
|------|---|
| | 1.3 wt. % |
| | 0.793 – 0.800 g/ml |
| | 9.5 – 10.5 mg KOH/g |
| n: | halogen-free di-carboxylic acid complex |
| | short-chain alcohols |
| | 12 °C |

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO 9454: 2231 (2.2.3.A) DIN-EN 61190-1-1 (acc. J-STD-004B): (IEC ORLO)

· Flux for the soldering of solar modules, tabber and stringer material, as well as connecting of cells Very good wetting properties

| lour: | colourless, clear liquid |
|-------|---|
| | 2.0 wt. % |
| | 0.793 – 0.800 g/ml |
| | 16 – 19 mg KOH/g |
| n: | halogen-free di-carboxylic acid-resin complex |
| | short-chain alcohols |
| | 12 °C |

SOLAR FLUX-EO-S-007 Cat.-No. 6207

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO 9454: 2131 (2.1.3.A) DIN-EN 61190-1-1 (acc. J-STD-004B): (IEC ORLO)



Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:

Canister 5 and 20 litres Uther packing sizes on request

Customer added values:

- Flux for soldering solar modules, tabber and stringer material, as well as the connection of cells
- Very good wetting properties
- Very good soldering properties
- Halogen-free and resin-/rosin-free
- No staining and sticky residues
- Available as concentrate
- · Available as fast-drying variant

Technical data:

| Appearance/odour: | colourless, clear liquid |
|-------------------|---|
| Solids content: | 2.0 wt. % |
| Density 20 °C: | 0.793 – 0.800 g/ml |
| Acid value: | 15 – 18 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex |
| Solvents: | short-chain alcohols |
| Flash point: | 12 °C |

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free

SOLAR FLUX-EO-S-008 Cat.-Nr. 6208



Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Canister 5 and 20 litres Other packing sizes on request

Customer added values:

WEEE /RoHS compliant, ISO 9454: 2131

DIN-EN 61190-1-1 (acc. J-STD-004B): (IEC ORLO)

- Flux for the soldering of solar modules, tabber and
- stringer material, as well as the connection of cells
- Very good wetting properties
- Very good soldering properties
- Halogen-free formulation
- No staining and sticky residues
- Available as concentrate
- Available as fast-drying variant

Technical data:

| colourless light yellow, clear liquid |
|---|
| 2.0 wt. % |
| 0.794 (+/- 0.003) g/ml |
| 15 – 18 mg KOH/g |
| halogen-free di-carboxylic acid complex |
| short-chain alcohols |
| 12 °C |
| |

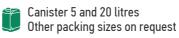
SOLAR FLUX-EO-S-009 Cat.-Nr. 6209



Technical data:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Application method:

Packaging units:

Soldering of solar modules, tabber and

Other packing sizes on request

Canister 5 and 20 litres

stringer material, as well as connecting cells

Application method:

Acid value: Activators/resir

SOLAR FLUX-EO-S-010 Cat.-Nr. 6210

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO-9454: 2231 DIN-EN 61190-1-1 (acc. J-STD-004B): L0 (IEC ORLO)

Customer added values:

- Halogen-free formulation
- · No staining and sticky residues
- Available as concentrate
- Available as fast-drying variant

Technical data:

| Appearance/odour: | farcolourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 1.5 wt. % |
| Density 20 °C: | 0,793 (+/- 0,003) g/ml |
| Acid value: | 11 – 15 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex with resin additive |
| Solvents: | short-chain alcohols |
| Flash point: | 12 °C |

Customer added values:

· Flux for soldering solar modules, tabber and stringer material, as well as the connection of cells Very good wetting properties Very good soldering properties Halogen-free formulation • No staining and sticky residues Available as concentrate · Available as fast-drying variant

| Appearance/odour: | colourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 1.8 wt. % |
| Density 20 °C: | 0,793 (+/- 0,003) g/ml |
| Acid value: | 16 – 18 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex with resin additive |
| Solvents: | short-chain alcohols |
| Flash point: | 12 °C |

• Flux for soldering solar modules, tabber and stringer material, as well as the connection of cells Very good wetting properties Very good soldering properties



SOLAR FLUX-EO-S-011 Cat.-Nr. 6211

No Clean-Flux, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO-9454: 2231 DIN-EN 61190-1-1 (acc. J-STD-004B): L0 (IEC ORLO)



Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



10

Canister 5 and 20 litres Other packing sizes on request

Customer added values:

- Flux for soldering solar modules, tabber and stringer material, as well as the connection of cells
- Very good wetting properties
- Very good soldering properties
- Halogen-free formulation
- No staining and sticky residues

Technical data:

| Aussehen/Geruch: | colourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 2.0 wt. % |
| Density 20 °C: | 0,86 – 0,88 g/ml |
| Acid value: | 16 – 19 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex with resin additive |
| Solvent: | alcohol/partial water basis |
| Flash point: | 20 °C |

SOLAR FLUX-EO-S-012 Cat.-Nr. 6212



- Very good wetting properties
- Very good soldering properties
- Halogen-free formulation
- of synth. resin

Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:

Canister 5 and 20 litres Other packing sizes on request

Technical data:

Additives: VOC:

SOLAR FLUX-EO-S-013 Cat.-Nr. 6213

Customer added values:

- · Flux for soldering solar modules, tabber and stringer material,
- as well as the connection of cells
- Very good wetting properties • Very good soldering properties
- Halogen-free formulation
- No staining and sticky residues
- Available as concentrate
- · Available as fast-drying variant

Technical data:

| Aussehen/Geruch: | colourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 2.0 wt. % |
| Density 20 °C: | 0,793 (+/- 0,003) g/ml |
| Acid value: | 5 – 7 mg KOH/g |
| Activators/resin: | halogen-free resin-di-carboxylic acid complex |
| Solvents: | short-chain alcohols |
| Flash point: | 12 °C |
| | |



Application method:

Packaging units:

Soldering of solar modules, tabber and

Other packing sizes on request

Canister 5 and 20 litres

stringer material, as well as connecting cells.

Customer added values:

- Flux for soldering solar modules, tabber and stringer material,
- as well as the connection of cells
- Contains organic, halogen-free, activating additives with low addition

• No staining and sticky residues

| Appearance/odour: | colourless-transparent liquid |
|-------------------|---------------------------------------|
| Solids content: | 2.0 wt. % |
| Density 20 °C: | 0,9 – 1,0 g/ml |
| Acid value: | 15 – 19 mg KOH/g |
| Activators/resin: | Di-carboxylic acids, synth. Resin |
| Solvent: | water with added alcohol |
| Flash point: | not applicable |
| Additives: | Wetting agent, alcohol compound <15 % |
| VOC: | 15 % |

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO-9454: 1231 DIN-EN 61190-1-1 (acc. J-STD-004B): L0 (IEC REL0)

SOLAR FLUX-EO-S-014 Cat.-Nr. 6214

No Clean-Flux, alcohol-based, especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO-9454: 2231 (2.2.3.A) DIN-EN 61190-1-1 (acc. J-STD-004B): L0 (IEC ORL0)



Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:

Canister 5 and 20 litres Other packing sizes on request

Customer added values:

- Flux for the soldering of solar modules, tabber and stringer material, as well as the connection of cells
- Very good wetting properties
- Very good soldering properties
- Halogen-free formulation
- No staining and sticky residues
- Available as concentrate
- · Available as fast-drying variant



| Appearance/odour: | colourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 2.1 wt. % |
| Density 20 °C: | 0,793 (+/- 0,003) g/ml |
| Acid value: | 13 – 16 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex with resin additive |
| Solvents: | short-chain alcohols |
| Flash point: | 12 °C |

No Clean-Flux especially for the solar industry, halogen-free and resin-/rosin-free

SOLAR FLUX-EO-S-015 Cat.-Nr. 6215

Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Canister 5 and 20 litres Other packing sizes on request

· Flux for the soldering of solar modules, tabber and stringer material,

Customer added values:

as well as the connection of cells

WEEE /RoHS compliant, ISO-9454: 2131 (2.1.3.A)

DIN-EN 61190-1-1 (acc. J-STD 004B): L0 (IEC ORLO)

- Very good wetting properties
- Very good soldering properties ٠
- Halogen-free formulation
- No staining and sticky residues

Technical data:

| Appearance/odour: | colourless, clear liquid |
|-------------------|--|
| Solids content: | 1.8 wt. % |
| Density 20 °C: | 0,86 – 0,88 g/ml |
| Acid value: | 15 – 18 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex, resin-/rosin-free |
| Solvent: | alcohol / partial water base |
| Flash point: | 20 °C |

SOLAR FLUX-EO-S-016 Cat.-Nr. 6216

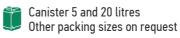


- Available as concentrate

Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Appearance/od Solids content: Density 20 °C: Acid value:

Activators/resi

Solvents: Flash point:

SOLAR FLUX-EO-S-017 Cat.-Nr. 6217

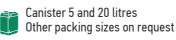
n-S-01

- Very good soldering properties Halogen-free formulation
- No staining and sticky residues

Application method:

Soldering of solar modules, tabber and stringer material, as well as connecting cells

Packaging units:



Technical data:

| Appearance/odour: | colourless light yellow, clear liquid |
|-------------------|---|
| Solids content: | 2.0 wt. % |
| Density 20 °C: | 0,82 – 0,88 g/ml |
| Acid value: | 18 – 21 mg KOH/g |
| Activators/resin: | halogen-free di-carboxylic acid complex with resin additive |
| Solvent: | alcohol/partial water basis |
| Flash point: | 12 °C |
| Additives: | wetting agent, alcohol compound 75 % |
| VOC: | 75 % |

Customer added values:

 Flux for the soldering of solar modules, tabber and stringer material, as well as the connection of cells Very good wetting properties Very good soldering properties Halogen-free formulation • No staining and sticky residues

· Available as fast-drying variant

Technical data:

| our: | colourless light yellow, clear liquid |
|------|--|
| | 1.9 % wt. % |
| | 0,793 (+/- 0,003) g/ml |
| | 15 – 18 mg KOH/g |
| n: | halogen-free di-carboxylic acid complex with synth. resin additive |
| | short-chain alcohols |
| | 12 °C |
| | |

No Clean-Flux especially for the solar industry, halogen-free WEEE /RoHS compliant, ISO-9454: 2131 (2.1.3.A) DIN-EN 61190-1-1 (acc. J-STD 004B): L0 (IEC ORLO)

Customer added values:

· Flux for the soldering of solar modules, tabber and stringer material,

- as well as the connection of cells
- Very good wetting properties

ETIMOL SEM 12 RAA Cat.-Nr. 5118

Cleaning agents especially for the solar industry



Customer added values:

- Etimol SEM 12 RAA is ideal for cleaning machines for the manufacturing of

- Solar modules and tabber and stringer material.
 Aqueous formulation, foaming, practical spray bottle with foam nozzle
 Low odour development even when the machine is still warm
 No need for flammable and corrosive chemicals during maintenance cleaning
- Etimol SEM 12 RAA is completely label-free

Application method:

Cleaning of machines for the production of solar modules and tabber and stringer material

Packaging units:



Spray bottle 1 litre

Technical data:

| Appearance/odour: | beige-brown, clear |
|------------------------------|--|
| Form of application: | ready for use |
| pH-value: | alkaline |
| Density 20 °C: | 1,000 (+/- 0,005) g/cm3 |
| Boiling point/boiling range: | >100 °C |
| System: | water-based |
| Application temperature: | room temperature |
| Cleans reliably: | flux residues, outgassing of printed circuit boards |
| Shelf life: | 36 months |
| Storage conditions: | ideally in sealed original container at 10 °C – 25 °C |
| Transport: | no dangerous goods, no labelling required |
| Flash point: | not applicable (>70 °C, non-flammable) |

EO-RA-V Cat.-Nr. 2946

Rinsing and cleaning agents, WEEE/RoHS compliant



Application method:

Cleaning of fluxer systems and their surrounding

Packaging units:

Canister 20 litres

Customer added values:

- EO-RA-V was particularly developed for the cleaning of fluxer systems and their surrounding
- When used properly, it enables meaningful testing of new fluxes on soldering systems

Technical data:

| Appearance/odour: | colourless, clear liquid |
|-------------------|--------------------------|
| Density 20 °C: | 0,82 – 0,84 g/ml |
| Solvent: | isopropyl alcohol/water |
| Flash point: | 12 °C |





Products for the solar industry

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