



# Products for the solar industry

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



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# 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
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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

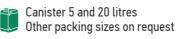
#### Customer added values:

- 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:

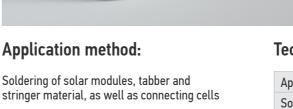
Appearance/odd Solids content: Density 20 °C: Acid value: Activators/resi Solvents: Flash point:



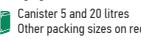








Packaging units:



**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

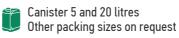
#### SOLAR FLUX-EO-S-009 Cat.-Nr. 6209



#### 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

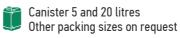


- Available as concentrate

#### **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

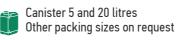
# n-S-01

- 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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