

Low voltage circuit breaker

SACE Emax



SACE Emax is a highly advanced low voltage air circuit-breakers with unparalleled versatility of use and able to solve all installation problems brilliantly and respond successfully to all plant engineering requirements, from standard ones to the most technologically advanced ones.

SACE Emax can be found in the three-pole and four-pole, fixed and withdrawable versions, fitted with the very latest generation electronic trip units, with the possibility of interchangeability. SACE Emax set up a new technological standard and leave you free to think up and build installations with extraordinary performances.

The present document applies to products made in Italy and manufactured in Frosinone plant.

This manufacturing site is certified according to ISO 9001, IRIS, ISO 14001, OHSAS 18001 and SA 8000.

Product Conformity & Compliance

REACH (Regulation EC 1907/2006)

SACE Emax and related accessories were classified as Articles and, during normal and reasonably foreseeable conditions of use, do not intentionally release any substance or preparation.

ABB SACE continuously undertakes communications throughout its supply chain in order to collect information about suppliers' compliance with REACH regulation.

SVHC (Regulation EC 1907/2006 REACH)

ABB SACE continuously assesses its products for content of Substances of Very High Concern (SVHC), as included in the "Candidate List" by the European Chemicals Agency (ECHA).

RoHS II

SACE Emax and related accessories are within the scope of Directive 2011/65/EU (RoHS II) starting from July 2019.

However, according to our best knowledge, SACE Emax and related accessories do not contain any of the restricted substances listed into RoHS II directive.

WEEE

SACE Emax and related accessories are included in the scope of Directive 2012/19/EU, starting from August 15th 2018.

Product Safety

Certification of conformity with the product Standards is carried out in the ABB SACE tests laboratory (accredited by ACCREDIA) in respect of UNI CEI EN ISO /IEC 17025 Standard, by the Italian certification body ACAE (Association for Certification of Electrical Apparatus), member of the European LOVAG organization (Low Voltage Agreement Group) and by the Swedish certification body Intertek Semko, belonging to the international IECEE organization.

Standard:

- IEC 60947-2.

Directives:

- EC “Low Voltage Directive (LVD) 2014/35/EC.
- EC “Electromagnetic Compatibility Directive” (EMC) 2014/30/EC.

Naval Registers:

- Lloyd’s Register of Shipping, Germanischer Lloyd, Bureau Veritas, Rina, Det Norske Veritas, Russian Maritime Register of Shipping, ABS.

Certifications and awards

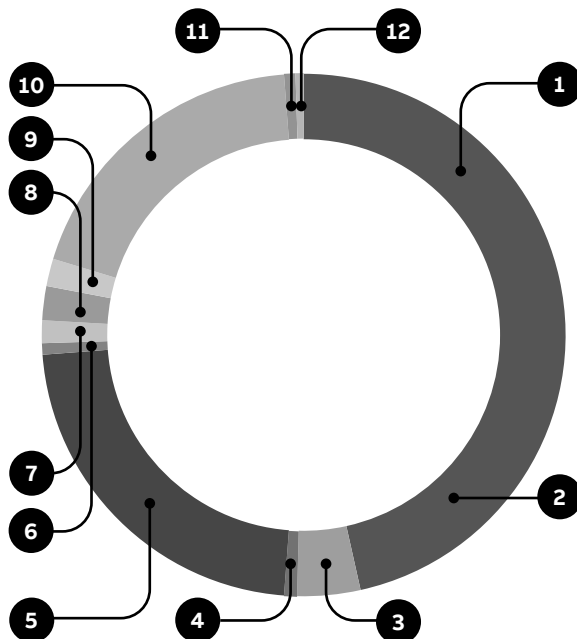


Material declaration

The charts below show the constituents of Emax 3-poles. The constituent materials are distributed as follows.

Emax E1 3P

The total weight of the product is 45.009 gr.



Material	Mass (g)	% wt
1 Steel	20.937	46,5%
2 Stainless steel	1747	3,9%
3 Precious metals	373	0,8%
4 Cu and Cu alloys	10.180	22,6%
5 Aluminium	309	0,7%
6 PA Compounds	644	1,4%
7 PC Compounds	931	2,1%
8 PET Compounds	774	1,7%
9 BMC/SMC	8.580	19,1%
10 Electronics	321	0,7%
11 Other	214	0,5%
TOTAL	45.009	100,0%

Emax E2 3P

The total weight of the product is 50.380 gr.

Material	Mass (g)	% wt
① Steel	23.263	46,2%
② Stainless steel	941	3,9%
③ Precious metals	414	0,8%
④ Cu and Cu alloys	12.726	25,3%
⑤ Aluminium	309	0,6%
⑥ PA Compounds	716	1,4%
⑦ PC Compounds	1035	2,1%
⑧ PET Compounds	861	1,7%
⑨ BMC/SMC	8.580	17,0%
⑩ Electronics	321	0,6%
⑪ Other	214	0,4%
TOTAL	50.380	100,0%

Emax E3 3P

The total weight of the product is 66.222 gr.

Material	Mass (g)	% wt
① Steel	26.797	40,5%
② Stainless steel	2809	4,2%
③ Precious metals	954	1,4%
④ Cu and Cu alloys	20.100	30,4%
⑤ Aluminium	309	0,5%
⑥ PA Compounds	1210	1,8%
⑦ PC Compounds	1135	1,7%
⑧ PET Compounds	1422	2,1%
⑨ BMC/SMC	10.839	16,4%
⑩ Electronics	353	0,5%
⑪ Other	294	0,4%
TOTAL	66.222	100,0%

Emax E4 3P

The total weight of the product is 96.422 gr.

Material	Mass (g)	% wt
① Steel	44.200	45,8%
② Stainless steel	3106	3,2%
③ Precious metals	1035	1,1%
④ Cu and Cu alloys	24.816	25,7%
⑤ Aluminium	371	0,4%
⑥ PA Compounds	1380	1,4%
⑦ PC Compounds	1995	2,1%
⑧ PET Compounds	1659	1,7%
⑨ BMC/SMC	17.160	17,8%
⑩ Electronics	385	0,4%
⑪ Other	316	0,3%
TOTAL	96.422	100,0%

Emax E6 3P

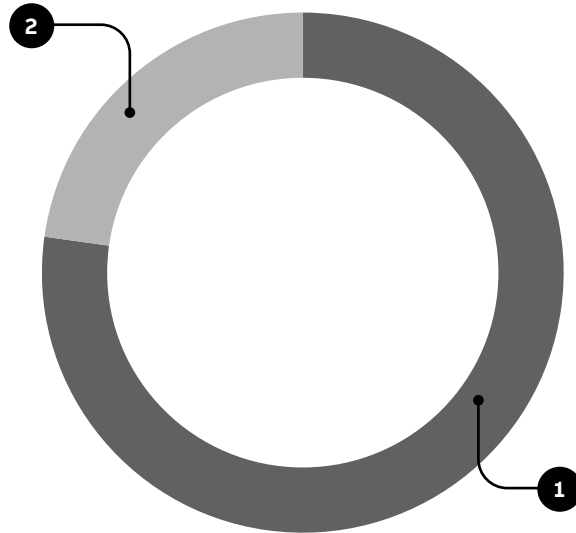
The total weight of the product is 136.268 gr.

Material	Mass (g)	% wt
① Steel	56.274	41,3%
② Stainless steel	4775	3,5%
③ Precious metals	1813	1,3%
④ Cu and Cu alloys	42.210	31,0%
⑤ Aluminium	371	0,3%
⑥ PA Compounds	2332	1,7%
⑦ PC Compounds	2187	1,6%
⑧ PET Compounds	2741	2,0%
⑨ BMC/SMC	22.762	16,7%
⑩ Electronics	424	0,3%
⑪ Other	380	0,3%
TOTAL	136.268	100,0%

Packaging

The total weight for Emax types packaging material is indicated below. The chart provides information for each packaging material used.

Emax packing material composition



Circuit-breaker	Weight (Kg)	Material	%
E1	8.760	① Wood	77,2%
		② Cardbox	22,8%
E2	8.760	① Wood	77,2%
		② Cardbox	22,8%
E3	10.050	① Wood	72,1%
		② Cardbox	27,9%
E4	10.862	① Wood	70%
		② Cardbox	30%
E6	16.600	① Wood	75,9%
		② Cardbox	24,1%

Product Use



Energy

The power losses for Emax is:

- 126 W per pole for E1 1600
- 110 W per pole for E2 2000
- 190 W per pole for E3 3200
- 220 W per pole for E4 4000
- 367 W per pole for E6 6300.

This value represent about 0.02% of the total power flowing through Emax. The energy consumption during the use of Emax has been estimated assuming 20 years of continuous operation with a 30% load rate and 100% operation time.

Energy consumption

Type	Energy (KWh)
E1 1600	5960
E2 2000	5203
E3 3200	8988
E4 4000	10407
E6 6300	17345

End-of-life

At the end of operating life, constituent components of Emax have been optimized in order to reduce waste amount and increase recovery of the material. Metals and polymers contained into Emax are characterized by high recycling rates.

Most plastic parts are marked for easy sorting. The recyclability potential of the product has been evaluated using IEC / TR 62635.

According to this standard, the potential recyclability ratio is > 70% for the whole Emax range.