

MOLDED CASE CIRCUIT BREAKERS - Q LINE (THQL, THQB, THQC, THHQL, THHQB, THHQC)

# PEP ecopassport®

## Product Environmental Profile



Product Environmental Profile - PEP Ecopassport.

Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"

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# ABB Purpose & Embedding Sustainability

ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow. With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.

Read more about ABB's sustainability framework and goals here:  
<https://global.abb/group/en/sustainability>



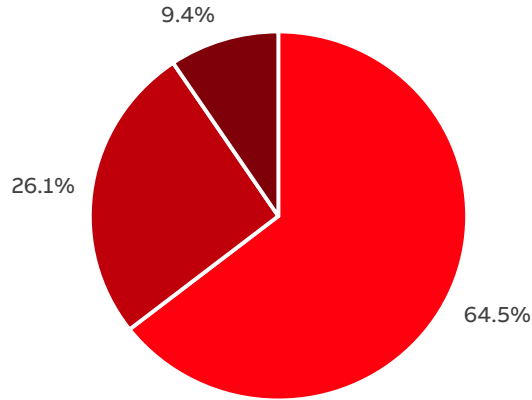
## General Information

<b>Reference product</b>	Catalog description: THQL2150 Plug-in Breaker Product ID: 1TQQ021050X0000 PSR product category: Circuit Breaker
<b>Description of the product</b>	The UL Molded Case Q Line Breaker is designed to protect electrical circuits from overloads and short circuits, ensuring reliability and safety under all operating conditions.
<b>Functional unit</b>	Protect the household installation from overload and short circuits in a circuit with rate voltage 120/240 V, rated current 50 A, with 2 poles (1P+1P), a rated breaking capacity 10 kA, and the tripping curve GES-9888, according to the appropriate use scenario, and during the reference service life of the product of 20 years.
<b>Other products covered</b>	The Molded Case Breaker Q Line types THQL, THQB, THQC, THHQL, THHQB and THHQC covered in this EPD, differ on the size (1" per pole), number of poles (1-2 poles), rated current (THQL, THQB = 15-50A for 1-pole & 15 - 60A for 2-pole, THQC/ THHQC = 20-60A for 1 and 2-pole, THHQL, THHQB = 15-60A for 1 and 2-pole) and trip time curve. In total, the Q Line breaker series covered in this EPD contains 90 unique product catalog numbers.

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# Constituent Materials



■ Plastics 201.71 g ■ Metals 81.62 g ■ Others 29.50 g

**Total weight of Reference product with packaging**

312.83

g

Plastics as % of weight		Metals as % of weight		Others as % of weight	
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%
Plastics	64.5	Metals	26.1	Other	9.4

Product compliant with RoHS and TSCA requirements.

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## Additional Environmental Information

<b>Manufacturing</b>	This product line is manufactured in ABB's net-zero Belo Horizonte, Brazil plant. This site is certified according to ISO 9001 and is part of ABB's Mission to Zero™ program.
<b>Distribution</b>	Distribution scenario has been modelled considering ABB average market for the product. Q Line delivery scenario includes truck, train and ship transportaiton scenarios.
<b>Installation</b>	The installation of the breakers in the load centers is performed manually, no environmental burdens are associated to this phase besides the disposal or recycling of the product packaging.
<b>Use</b>	No consumables and maintenance.
<b>End of life</b>	Due to lack of data around customer disposal methodology, landfill disposal is the assumed standard scenario.
<b>Benefits and loads beyond the system boundaries</b>	Not considered or evaluated.

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# Environmental Impacts

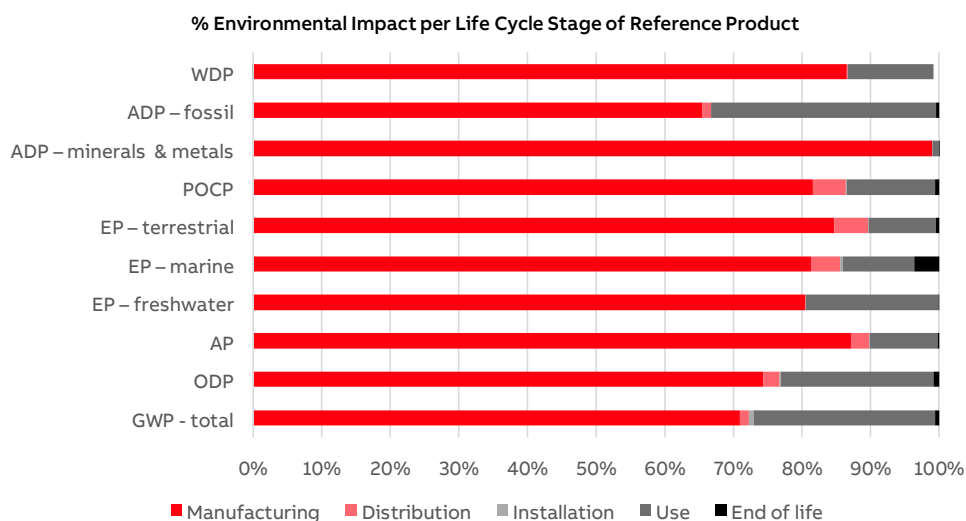
Reference lifetime	20 years
Product category	Circuit breakers
Installation elements	No special installation elements required.
Use scenario	Load time: 15% of rated current. Use time rate: 30% of reference lifetime.
Geographical representativeness	United States of America (USA)
Technological representativeness	Represents the Molded Case Q Line Circuit Breaker types THQB, THQC, THQL, THHQB, THHQC, THHQL.
Software and database used	SimaPro 9.6 with ecoinvent database 3.10

## Energy model used

Manufacturing	Electricity, high voltage [RoW]   electricity production, hydro, pumped storage   Cut-off, S
Installation	-
Use	Electricity, low voltage {US}   market for electricity, low voltage   Cut-off, S
End of life	-

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## Common base of mandatory indicators



### Environmental impact indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
<b>GWP-total</b>	<b>kg CO<sub>2</sub> eq.</b>	8.64E+00	6.13E+00	1.18E-01	5.98E-02	2.28E+00	5.03E-02
<b>GWP-fossil</b>	<b>kg CO<sub>2</sub> eq.</b>	8.53E+00	6.09E+00	1.18E-01	5.89E-03	2.27E+00	5.00E-02
<b>GWP-biogenic</b>	<b>kg CO<sub>2</sub> eq.</b>	8.36E-02	1.85E-02	1.49E-05	5.40E-02	1.08E-02	3.41E-04
<b>GWP-luluc</b>	<b>kg CO<sub>2</sub> eq.</b>	2.06E-02	1.94E-02	5.56E-05	2.23E-06	1.17E-03	1.58E-05
GWP-fossil = Global Warming Potential fossil fuels GWP-biogenic = Global Warming Potential biogenic GWP-luluc = Global Warming Potential land use and land use change							
<b>ODP</b>	<b>kg CFC-11 eq.</b>	7.09E-08	5.27E-08	1.73E-09	8.48E-11	1.58E-08	5.47E-10
ODP = Depletion potential of the stratospheric ozone layer							
<b>AP</b>	<b>H<sup>+</sup> eq.</b>	7.54E-02	6.57E-02	2.06E-03	2.83E-05	7.48E-03	1.48E-04
AP = Acidification potential, Accumulated Exceedance							
<b>EP-freshwater</b>	<b>kg P eq.</b>	7.57E-03	6.09E-03	6.58E-06	4.94E-07	1.47E-03	2.76E-06
<b>EP-marine</b>	<b>kg N eq.</b>	1.29E-02	1.05E-02	5.48E-04	4.81E-05	1.35E-03	4.72E-04
<b>EP-terrestrial</b>	<b>mol N eq.</b>	1.23E-01	1.04E-01	6.06E-03	1.03E-04	1.20E-02	5.89E-04
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment EP-terrestrial = Eutrophication potential, Accumulated Exceedance							
<b>POCP</b>	<b>kg NMVOC eq.</b>	3.64E-02	2.97E-02	1.73E-03	5.09E-05	4.69E-03	2.17E-04
POCP = Formation potential of tropospheric ozone							
<b>ADP-minerals &amp; metals</b>	<b>kg Sb eq.</b>	1.95E-03	1.93E-03	2.11E-07	1.76E-08	1.90E-05	9.07E-08
<b>ADP-fossil</b>	<b>MJ</b>	1.27E+02	8.32E+01	1.56E+00	7.47E-02	4.17E+01	5.07E-01
ADP-minerals & metals = Abiotic depletion potential for non-fossil resources ADP-fossil = Abiotic depletion for fossil resources potential							
<b>WDP</b>	<b>m<sup>3</sup> eq. depr.</b>	4.04E+00	3.56E+00	5.95E-03	-4.45E-03	5.13E-01	-2.96E-02
WDP = Water Deprivation potential							

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## Common base of mandatory indicators

### Inventory flows indicator – Resource use indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
PERE	MJ	1.36E+01	8.33E+00	1.73E-02	2.97E-03	5.27E+00	6.85E-03
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.36E+01	8.33E+00	1.73E-02	2.97E-03	5.27E+00	6.85E-03
PENRE	MJ	1.36E+02	8.92E+01	1.66E+00	7.94E-02	4.41E+01	5.39E-01
PENRM	MJ	1.59E-03	1.59E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.36E+02	8.92E+01	1.66E+00	7.94E-02	4.41E+01	5.39E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM = Use of renewable primary energy resources used as raw materials

PERT = Total Use of renewable primary energy resources

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total Use of non-renewable primary energy resources

### Inventory flows indicator – Indicators describing the use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
SM	kg	2.95E-02	2.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	1.02E-03	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m <sup>3</sup>	2.95E-03	2.95E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SM = Use of secondary material

RSF = Use of renewable secondary fuels

NRSF = Use of non-renewable secondary fuels

FW = Use of net fresh water

### Inventory flows indicator – Waste category indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
Hazardous waste disposed	kg	7.50E-07	7.50E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non- hazardous waste disposed	kg	2.91E-01	5.92E-02	0.00E+00	2.95E-02	0.00E+00	2.02E-01
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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## Common base of mandatory indicators

### Inventory flows indicator – Output flow indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
Components for re- use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.03E-01	9.22E-02	0.00E+00	2.95E-02	0.00E+00	8.16E-02
Materials for energy recovery	kg	2.61E-01	5.92E-02	0.00E+00	0.00E+00	0.00E+00	2.02E-01
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

### Inventory flow indicator – other indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
Biogenic carbon content of the product	kg of C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	kg of C	0.00E+00	2.77E-02	0.00E+00	-2.77E-02	0.00E+00	0.00E+00

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## Optional indicators

### Environmental indicators

Indicator	Unit	Total	Manu- facturing	Distri- bution	Installation	Use	End of life
Total use of primary energy during the life cycle	MJ	1.97E+01	2.60E+00	0.00E+00	0.00E+00	1.71E+01	0.00E+00
Emissions of fine particles	incidence of diseases	4.63E-07	4.14E-07	7.62E-09	5.68E-10	3.65E-08	3.59E-09
Ionizing radiation, human health	kBq U235 eq.	4.63E-07	3.68E-01	1.11E-03	1.48E-04	8.78E-01	4.59E-04
Ecotoxicity (fresh water)	CTUe	4.63E-07	2.61E+02	6.78E-01	2.56E+00	1.37E+01	1.63E+00
Human toxicity, car-cinogenic effects	CTUh	4.63E-07	8.79E-08	1.14E-09	6.64E-11	8.06E-09	3.51E-10
Human toxicity, non-carcinogenic effects	incidence of diseases	4.63E-07	7.51E-07	1.37E-09	4.28E-10	4.68E-08	1.49E-09
Impact related to land use/soil quality		4.63E-07	3.56E+01	8.42E-01	7.02E-02	7.19E+00	5.77E-01

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## Extrapolation Factors

For other products than the Reference product covered by this PEP, the environmental impacts for each phase of the lifecycle are obtained by multiplying the values of the Reference product by the following coefficients:

\* if the coefficient is "1", the impacts of the phase of the life cycle are assimilated to the Reference product, meaning that the impacts are unchanged in comparison to the Reference product

Product name	Manu- facturing	Distri- bution	Installation	Use	End of life
THQL1115	0.48	0.48	0.50	0.46	0.48
THQL1120	0.48	0.48	0.50	0.48	0.48
THQL1125	0.48	0.48	0.50	0.65	0.48
THQL1130	0.48	0.48	0.50	0.71	0.48
THQL1135	0.49	0.49	0.50	0.55	0.49
THQL1140	0.49	0.49	0.50	0.73	0.49
THQL1145	0.49	0.49	0.50	0.88	0.49
THQL1150	0.49	0.49	0.50	1.00	0.49
THQL2115	0.97	0.97	1.00	0.46	0.97
THQL2120	0.97	0.97	1.00	0.48	0.97
THQL2125	0.97	0.97	1.00	0.65	0.97
THQL2130	0.97	0.97	1.00	0.71	0.97
THQL2135	1.00	1.00	1.00	0.55	1.00
THQL2140	1.00	1.00	1.00	0.73	1.00
THQL2145	1.00	1.00	1.00	0.88	1.00
THQL2150	1.00	1.00	1.00	1.00	1.00
THQL2160	1.00	1.00	1.00	1.56	1.00
THQB1115	0.49	0.49	0.50	0.21	0.49
THQB1120	0.49	0.49	0.50	0.50	0.49
THQB1125	0.49	0.49	0.50	0.61	0.49
THQB1130	0.49	0.49	0.50	0.77	0.49
THQB1135	0.51	0.51	0.50	0.77	0.51
THQB1140	0.51	0.51	0.50	0.90	0.51
THQB1145	0.51	0.51	0.50	1.16	0.51
THQB1150	0.51	0.51	0.50	1.06	0.51
THQB2115	1.01	1.01	1.00	0.21	1.01
THQB2120	1.01	1.01	1.00	0.50	1.01
THQB2125	1.01	1.01	1.00	0.61	1.01
THQB2130	1.01	1.01	1.00	0.77	1.01
THQB2135	1.04	1.04	1.00	0.77	1.04
THQB2140	1.04	1.04	1.00	0.90	1.04
THQB2145	1.04	1.04	1.00	1.16	1.04
THQB2150	1.04	1.04	1.00	1.06	1.04
THQB2160	1.04	1.04	1.00	1.39	1.04
THQC1120	0.57	0.57	0.50	0.48	0.57
THQC1130	0.57	0.57	0.50	0.75	0.57

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## Extrapolation Factors

Product name	Manu- facturing	Distri- bution	Installation	Use	End of life
THQC1140	0.58	0.58	0.50	0.86	0.58
THQC1150	0.58	0.58	0.50	1.08	0.58
THQC1160	0.58	0.58	0.50	2.49	0.58
THQC2120	1.16	1.16	1.00	0.48	1.16
THQC2130	1.16	1.16	1.00	0.75	1.16
THQC2140	1.17	1.17	1.00	0.86	1.17
THQC2150	1.17	1.17	1.00	1.08	1.17
THQC2160	1.17	1.17	1.00	2.49	1.17
THHQL1115	0.48	0.48	0.50	0.46	0.48
THHQL1120	0.48	0.48	0.50	0.48	0.48
THHQL1125	0.48	0.48	0.50	0.65	0.48
THHQL1130	0.48	0.48	0.50	0.71	0.48
THHQL1135	0.49	0.49	0.50	0.55	0.49
THHQL1140	0.49	0.49	0.50	0.73	0.49
THHQL1145	0.49	0.49	0.50	0.88	0.49
THHQL1150	0.49	0.49	0.50	1.00	0.49
THHQL1160	0.49	0.49	0.50	1.56	0.49
THHQL2115	0.97	0.97	1.00	0.46	0.97
THHQL2120	0.97	0.97	1.00	0.48	0.97
THHQL2125	0.97	0.97	1.00	0.65	0.97
THHQL2130	0.97	0.97	1.00	0.71	0.97
THHQL2135	1.00	1.00	1.00	0.55	1.00
THHQL2140	1.00	1.00	1.00	0.73	1.00
THHQL2145	1.00	1.00	1.00	0.88	1.00
THHQL2150	1.00	1.00	1.00	1.00	1.00
THHQL2160	1.00	1.00	1.00	1.56	1.00
THHQB1115	0.49	0.49	0.50	0.21	0.49
THHQB1120	0.49	0.49	0.50	0.50	0.49
THHQB1125	0.49	0.49	0.50	0.61	0.49
THHQB1130	0.49	0.49	0.50	0.77	0.49
THHQB1135	0.51	0.51	0.50	0.77	0.51
THHQB1140	0.51	0.51	0.50	0.90	0.51
THHQB1145	0.51	0.51	0.50	1.16	0.51
THHQB1150	0.51	0.51	0.50	1.06	0.51
THHQB1160	0.51	0.51	0.50	1.39	0.51
THHQB2115	1.01	1.01	1.00	0.21	1.01
THHQB2120	1.01	1.01	1.00	0.50	1.01
THHQB2125	1.01	1.01	1.00	0.61	1.01
THHQB2130	1.01	1.01	1.00	0.77	1.01
THHQB2135	1.04	1.04	1.00	0.77	1.04
THHQB2140	1.04	1.04	1.00	0.90	1.04

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## Extrapolation Factors

Product name	Manu- facturing	Distri- bution	Installation	Use	End of life
THHQB2145	1.04	1.04	1.00	1.16	1.04
THHQB2150	1.04	1.04	1.00	1.06	1.04
THHQB2160	1.04	1.04	1.00	1.39	1.04
THHQC1120	0.57	0.57	0.50	0.48	0.57
THHQC1130	0.57	0.57	0.50	0.75	0.57
THHQC1140	0.58	0.58	0.50	0.86	0.58
THHQC1150	0.58	0.58	0.50	1.08	0.58
THHQC1160	0.58	0.58	0.50	2.49	0.58
THHQC2120	1.16	1.16	1.00	0.48	1.16
THHQC2130	1.16	1.16	1.00	0.75	1.16
THHQC2140	1.17	1.17	1.00	0.86	1.17
THHQC2150	1.17	1.17	1.00	1.08	1.17
THHQC2160	1.17	1.17	1.00	2.49	1.17

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## Environmental Impact Indicator Glossary


### Impact indicators

Indicator	Description	Distribution
Global warming potential (GWP) - total	Indicator of potential global warming caused by emissions to air contributing to the greenhouse effect. The total global warming potential (GWP-total) is the sum of three sub-categories of climate change. GWP-total = GWP-fossil + GWP-biogenic + GWP- land use and land use change	kg CO <sub>2</sub> eq.
Ozone depletion (ODP)	Emissions to air that contribute to the destruction of the stratospheric ozone layer	kg CFC-11 eq.
Acidification of soil and water (A)	Acidification of soils and water caused by the release of certain gases to the atmosphere, such as nitrogen oxides and sulphur oxides	H+ eq.
Eutrophication (E)	Indicator of the contribution to eutrophication of water by the enrichment of the aquatic ecosystem with nutritional elements, e.g. industrial or domestic effluents, agriculture, etc. This indicator is divided to three: freshwater, marine and terrestrial.	kg P eq., kg N eq., mole N eq.
Photochemical ozone creation (POCP)	Indicator of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) because of the rays of the sun.	kg NMVOC eq.
Depletion of abiotic resources – elements (ADPe)	Indicator of the depletion of natural non-fossil resources	kg Sb eq.
Depletion of abiotic resources – fossil fuels (ADPf)	The use of non-renewable fossil resources in an unsustainable way (e.g. from material to waste)	MJ (lower heating value)
Water Deprivation potential (WDP)	Deprivation-weighted water consumption. Assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived.	m <sup>3</sup> eq. depr.

### Resource use indicators

Indicator	Description	Distribution
Total use of primary energy	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) + Total use of renewable primary energy re-sources (primary energy and primary energy resources used as raw materials)	MJ (lower heating value)

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Verifier accreditation number: <b>VH44</b>	Information and reference documents: <b>www.pep-ecopassport.org</b>
Date of issue: <b>07-2024</b>	Validity period: <b>5 years</b>
<b>Independent verification of the declaration and data, in compliance with ISO 14025: 2006</b>	
<b>Internal:</b> <input type="radio"/>	<b>External:</b> <input checked="" type="radio"/>
The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)	
PEP are compliant with XP C08-100-1 :2016 or EN 50693:2019 or NE E38-500 :2022 The components of the present PEP may not be compared with elements from any other program.	
Document in compliance with ISO 14025: 2006 "Environmental labels and declarations. Type III environmental declarations"	
	

STATUS	SECURITY LEVEL	REGISTRATION NUMBER	REV.	LANG.	PAGE
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