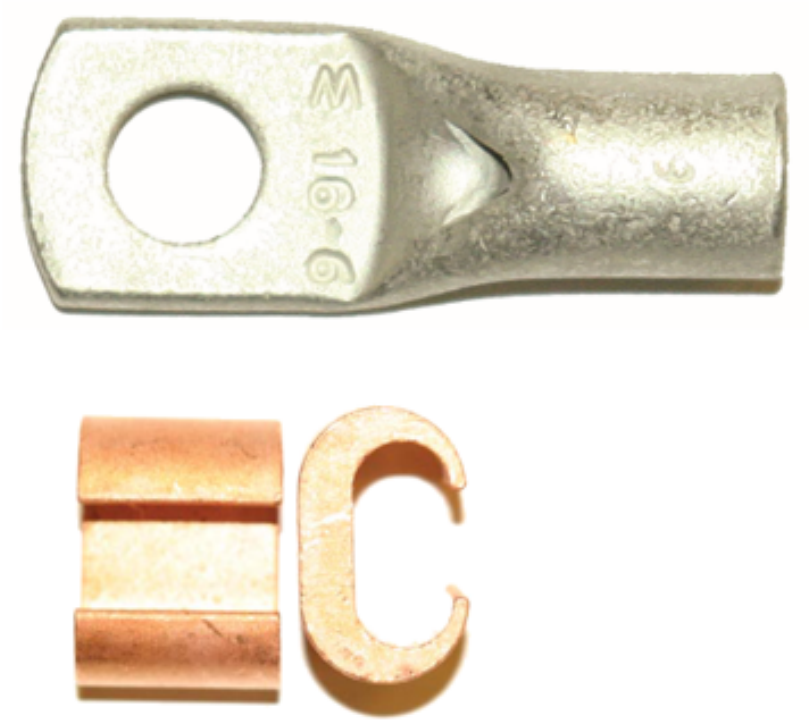
Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Abiko Cable lugs and C-clamps



Registration number:	EPD-Kiwa-EE-204954-EN
Issue date:	05-06-2025
Valid until:	05-06-2030
Declaration owner:	Ingeniørfirma ABIKO norsk AS, Norway
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Abiko Cable lugs and C-clamps

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-204954-EN

1.3 VALIDITY

Issue date: 05-06-2025

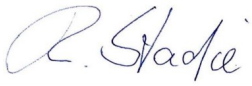
Valid until: 05-06-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Manufacturer: Ingeniørfirma ABIKO norsk AS, Norway

Address: Haslevollen 3, 0579 Oslo, Norway

E-mail: abiko@abiko.no

Website: www.abiko.no

Production location: Third-party production facility, Arlandastad, Sweden

Address production location: Daléns gata 7, 19561 Arlandastad, Sweden

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Kripanshi Gupta, Kiwa GmbH

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.2.0 Annex B1 Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804/ ISO 21930, SOP EE 1203_R. 2.0 (27.02.2025).

The Norwegian EPD Foundation - NPCR 013 Part B for Steel and Aluminium Construction Products (references to EN 15804 +A2).

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of

1 General information

the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: R<THINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.19 (20250306)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Abiko Cable lugs and C-clamps' with the calculation identifier ReTHiNK-104954.

2 Product

2.1 PRODUCT DESCRIPTION

Ingeniørfirma ABIKO Norsk AS cable lugs and C-clamps are produced by cutting/ tumbling/heating copper tubes/profiles to the appropriate temperature for processing. The tubes are then punched and machined into the specified shape before the surface is tinned, the C-profiles are cut and marked accordingly.

Compression cable lugs and C-clamps provide the most reliable and durable connection points for cables in electrical installations. The copper tubular compression lugs, suitable for copper cables ranging from 0,75 to 800 mm², and from 1 gram to 1750 gram, are tinned and feature an inspection hole. The C-clamps suitable for branch and splicing earth cables ranging 6-300mm² and from 1 gram to 255 grams.

This declaration pertains to one unit of cable lugs with the weight of 1,75 kg which serves as the declared unit in this EPD. This EPD represents a *worst-case scenario*, covering the largest and heaviest product variant within the product range. All other variations of Ingeniørfirma ABIKO Norsk AS cable lugs and C-clamps that are smaller in size and weight and all produced at the same locations described in the production process, are also included within the scope of this declaration.

Raw material	Value (%)
Copper	99,90
Tin	0,10

All types of cable lugs and C-clamps evaluated in this study are listed in the table below.

ABIKO NR	cable lugs and C-clamps	EL.NR
KR 0,75-3 G	Std. tubular cable lugs,Cu 0,75mm². Fork	2014100
KR 0,75-4 G	Std. tubular cable lugs,Cu 0,75mm². Fork	2014102
KR 1,5-3 G	Std. tubular cable lugs, Cu 1,5mm². Fork	2014104
KR 1,5-4 G	Std. tubular cable lugs, Cu 1,5mm². Fork	2014106
KR 1,5-5 G	Std. tubular cable lugs, Cu 1,5mm². Fork	2014108
KR 1,5-6 G	Std. tubular cable lugs, Cu 1,5mm². Fork	2014110
KR 2,5-5 G	Std. tubular cable lugs, Cu 2,5mm². Fork	2014114
KR 2,5-6 G	Std. tubular cable lugs, Cu 2,5mm². Fork	2014116
KR 4-4 G	Std. tubular cable lugs, Cu 4mm². Fork	2014118
KR 4-5 G	Std. tubular cable lugs, Cu 4mm². Fork	2014120
KR 4-6 G	Std. tubular cable lugs, Cu 4mm². Fork	2014122
KR 6-4 G	Std. tubular cable lugs, Cu 6mm². Fork	2014124
KR 6-5 G	Std. tubular cable lugs, Cu 6mm². Fork	2014128
KR 6-6 G	Std. tubular cable lugs, Cu 6mm². Fork	2014130
KRF 16-6 G	Std. tubular cable lugs, Cu 16mm², Fork	2014132
KRTS 35-6	KRT tubular cable lugs, narrow splice 15mm	2014136
KRTS 50-6	KRT tubular cable lugs, narrow splice 15mm	2014150
KRTS 50-8	KRT tubular cable lugs, narrow splice 17mm	2014154
KRTS 50-10	KRT tubular cable lugs, narrow splice 19mm	2014155
KRTS 70-6	KRT tubular cable lugs, narrow splice 17mm	2014156
KRTS 70-8	KRT tubular cable lugs, narrow splice 17mm	2014158
KRTS 70-10	KRT tubular cable lugs, narrow splice 19mm	2014159
KRTS 70-12	KRT tubular cable lugs, narrow splice	2014160
KRTS 95-6	KRT tubular cable lugs, narrow splice 19mm	2014161
KRTS 95-8	KRT tubular cable lugs, narrow splice 19mm	2014164
KRTS 95-10	KRT tubular cable lugs, narrow splice 19mm	2014165
KRTS 95-12	KRT tubular cable lugs, narrow splice 19mm	2014166
KRTS 120-6	KRT tubular cable lugs, narrow splice 19mm	2014167
KRTS 120-8	KRT tubular cable lugs, narrow splice 19mm	2014170
KRTS 120-10	KRT tubular cable lugs, narrow splice 19mm	2014171
KRTS 120-12	KRT tubular cable lugs, narrow splice 22mm	2014172
KRTS 150-6	KRT tubular cable lugs, narrow splice 19mm	2014173
KRTS 150-8	KRT tubular cable lugs, narrow splice 19mm	2014176
KRTS 150-10	KRT tubular cable lugs, narrow splice 19mm	2014177
KRTS 150-12	KRT tubular cable lugs, narrow splice 22mm	2014178
KRTS 185-10	KRT tubular cable lugs, narrow splice 26mm	2014179
KRTS 185-12	KRT tubular cable lugs, narrow splice 26mm	2014181
KRTS 185-16	KRT tubular cable lugs, narrow splice 26mm	2014182
KRTS 240-10	KRT tubular cable lugs, narrow splice 30mm	2014183
KRTS 240-12	KRT tubular cable lugs, narrow splice 30mm	2014188

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KRTS 240-16	KRT tubular cable lugs, narrow splice 30mm	2014189
KRTS 300-10	KRT tubular cable lugs, narrow splice 31mm	2014190
KRTS 300-12	KRT tubular cable lugs, narrow splice 31mm	2014191
KR 0,75-3	Std. tubular cable lugs, Cu 0,75mm² M3	2014192
KR 0,75-4	Std. tubular cable lugs, Cu 0,75mm² M4	2014210
KR 1,5-3	Std. tubular cable lugs, Cu 1,5mm² M3	2014212
KR 1,5-4	Std. tubular cable lugs, Cu 1,5mm² M4	2014220
KR 1,5-5	Std. tubular cable lugs, Cu 1,5mm² M5	2014224
KR 1,5-6	Std. tubular cable lugs, Cu 1,5mm² M6	2014228
KR 2,5-3	Std. tubular cable lugs, Cu 2,5mm² M3	2014230
KR 2,5-4	Std. tubular cable lugs, Cu 2,5mm² M4	2014240
KR 2,5-5	Std. tubular cable lugs, Cu 2,5mm² M5	2014244
KR 2,5-6	Std. tubular cable lugs, Cu 2,5mm² M6	2014248
KR 2,5-8	Tubular cable lugs, UL, Cu 2,5mm² M8	2014252
KR 4-4	Std. tubular cable lugs, Cu 4mm² M4	2014254
KR 4-5	Std. tubular cable lugs, Cu 4mm² M5	2014270
KR 4-6	Std. tubular cable lugs, Cu 4mm² M6	2014274
KR 4-8	Std. tubular cable lugs, Cu 4mm² M8	2014278
KR 6-4	Std. tubular cable lugs, Cu 6mm² M4	2014280
KR 6-5	Std. tubular cable lugs, Cu 6mm² M5	2014310
KR 6-6	Std. tubular cable lugs, Cu 6mm² M6	2014314
KR 6-8	Std. tubular cable lugs, Cu 6mm² M8	2014318
KRF 10-4	Std. tubular cable lugs, Cu 10mm² M4	2014322
KRF 10-5	Std. tubular cable lugs, Cu 10mm² M5	2014328
KRF 10-6	Std. tubular cable lugs, Cu 10mm² M6	2014330
KRF 10-8	Std. tubular cable lugs, Cu 10mm² M8	2014334
KRF 10-10	Std. tubular cable lugs, Cu 10mm² M10	2014338
KRF 10-12	Std. tubular cable lugs, Cu 10mm² M12	2014342
KRF 16-5	Std. tubular cable lugs, Cu 16mm² M5	2014346
KRF 16-6	Std. tubular cable lugs, Cu 16mm² M6	2014358
KRF 16-8	Std. tubular cable lugs, Cu 16mm² M8	2014360
KRF 16-10	Std. tubular cable lugs, Cu 16mm² M10	2014364
KRF 16-12	Std. tubular cable lugs, Cu 16mm² M12	2014368
KRF 16-16	Std. tubular cable lugs, Cu 16mm² M16	2014370
KRF 25-5	Std. tubular cable lugs, Cu 25mm² M5	2014372
KRF 25-6	Std. tubular cable lugs, Cu 25mm² M6	2014379
KRF 25-8	Std. tubular cable lugs, Cu 25mm² M8	2014380
KRF 25-10	Std. tubular cable lugs, Cu 25mm² M10	2014384
KRF 25-12	Std. tubular cable lugs, Cu 25mm² M12	2014388
KRF 25-16	Std. tubular cable lugs, Cu 25mm² M16	2014390
KRF 35-5	Std. tubular cable lugs, Cu 35mm² M5	2014392
KRF 35-6	Std. tubular cable lugs, Cu 35mm² M6	2014409
KRF 35-8	Std. tubular cable lugs, Cu 35mm² M8	2014410
KRF 35-10	Std. tubular cable lugs, Cu 35mm² M10	2014414
KRF 35-12	Std. tubular cable lugs, Cu 35mm² M12	2014418
KRF 35-16	Std. tubular cable lugs, Cu 35mm² M16	2014420
KRF 50-6	Std. tubular cable lugs, Cu 50mm² M6	2014422
KRF 50-8	Std. tubular cable lugs, Cu 50mm² M8	2014428
KRF 50-10	Std. tubular cable lugs, Cu 50mm² M10	2014430
KRF 50-12	Std. tubular cable lugs, Cu 50mm² M12	2014434
KRF 50-16	Std. tubular cable lugs, Cu 50mm² M16	2014438
KRF 50-20	Std. tubular cable lugs, Cu 50mm² M20	2014440
KRF 70-6	Std. tubular cable lugs, Cu 70mm² M6	2014442
KRF 70-8	Std. tubular cable lugs, Cu 70mm² M8	2014448
KRF 70-10	Std. tubular cable lugs, Cu 70mm² M10	2014450
KRF 70-12	Std. tubular cable lugs, Cu 70mm² M12	2014454
KRF 70-16	Std. tubular cable lugs, Cu 70mm² M16	2014458
KRF 70-20	Std. tubular cable lugs, Cu 70mm² M20	2014460
KRF 95-8	Std. tubular cable lugs, Cu 95mm² M8	2014462
KRF 95-10	Std. tubular cable lugs, Cu 95mm² M10	2014468

2 Product

KRF 95-12	Std. tubular cable lugs, Cu 95mm² M12	2014470
KRF 95-16	Std. tubular cable lugs, Cu 95mm² M16	2014474
KRF 95-20	Std. tubular cable lugs, Cu 95mm² M20	2014478
KRF 120-8	Std. tubular cable lugs, Cu 120mm² M8	2014480
KRF 120-10	Std. tubular cable lugs, Cu 120mm² M10	2014488
KRF 120-12	Std. tubular cable lugs, Cu 120mm² M12	2014490
KRF 120-16	Std. tubular cable lugs, Cu 120mm² M16	2014494
KRF 150-8	Std. tubular cable lugs, Cu 150mm² M8	2014498
KRF 150-10	Std. tubular cable lugs, Cu 150mm² M10	2014506
KRF 150-12	Std. tubular cable lugs, Cu 150mm² M12	2014508
KRF 150-16	Std. tubular cable lugs, Cu 150mm² M16	2014510
KRF 150-20	Std. tubular cable lugs, Cu 150mm² M20	2014514
KRF 185-10	Std. tubular cable lugs, Cu 185mm² M10	2014518
KRF 185-12	Std. tubular cable lugs, Cu 185mm² M12	2014528
KRF 185-16	Std. tubular cable lugs, Cu 185mm² M16	2014530
KRF 185-20	Std. tubular cable lugs, Cu 185mm² M20	2014534
KRF 240-10	Std. tubular cable lugs, Cu 240mm² M10	2014538
KRF 240-12	Std. tubular cable lugs, Cu 240mm² M12	2014546
KRF 240-16	Std. tubular cable lugs, Cu 240mm² M16	2014548
KRF 240-20	Std. tubular cable lugs, Cu 240mm² M20	2014550
KRF 300-10	Std. tubular cable lugs, Cu 300mm² M10	2014554
KRF 300-12	Std. tubular cable lugs, Cu 300mm² M12	2014564
KRF 300-16	Std. tubular cable lugs, Cu 300mm² M16	2014566
KRF 300-20	Std. tubular cable lugs, Cu 300mm² M20	2014568
KRF 400-12	Std. tubular cable lugs, Cu 400mm² M12	2014570
KRF 400-16	Std. tubular cable lugs, Cu 400mm² M16	2014586
KRF 400-20	Std. tubular cable lugs, Cu 400mm² M20	2014588
KRFA 240-10	Tubular cable lugs, KRFA (30 Grounding clamp)	2014590
KRFA 240-12	Tubular cable lugs, KRFA (30 Grounding clamp)	2014591
KRFA 240-16	Tubular cable lugs, KRFA (30 Grounding clamp)	2014592
KRFA 240-20	Tubular cable lugs, KRFA (30 Grounding clamp)	2014593
KRFA 300-10	Tubular cable lugs, KRFA (32 Grounding clamp)	2014594
KRFA 300-12	Tubular cable lugs, KRFA (32 Grounding clamp)	2014595
KRFA 300-16	Tubular cable lugs, KRFA (32 Grounding clamp)	2014596
KRFA 300-20	Tubular cable lugs, KRFA (32 Grounding clamp)	2014597
KRFA 400-12	Tubular cable lugs, KRFA (38 Grounding clamp)	2014598
KRFA 400-16	Tubular cable lugs, KRFA (38 Grounding clamp)	2014599
KR 6-6 90 GR	Std. tubular cable lugs, 90° angle, 6mm²	2014600
KRF 10-6 90 GR	Std. tubular cable lugs, 90° angle, 10mm²	2014608
KRF 16-5 90 GR	Std. tubular cable lugs, 90° angle, 16mm²	2014612
KRF 16-6 90 GR	Std. tubular cable lugs, 90° angle, 16mm²	2014615
KRF 16-8 90 GR	Std. tubular cable lugs, 90° angle, 16mm²	2014616
KRF 16-10 90 GR	Std. tubular cable lugs, 90° angle, 16mm²	2014617
KRF 25-6 90 GR	Std. tubular cable lugs, 90° angle, 25mm²	2014618
KRF 25-8 90 GR	Std. tubular cable lugs, 90° angle, 25mm²	2014623
KRF 25-10 90 GR	Std. tubular cable lugs, 90° angle, 25mm²	2014624
KRF 35-6 90 GR	Std. tubular cable lugs, 90° angle, 35mm²	2014625
KRF 35-8 90 GR	Std. tubular cable lugs, 90° angle, 35mm²	2014629
KRF 35-10 90 GR	Std. tubular cable lugs, 90° angle, 35mm²	2014630
KRF 50-6 90 GR	Std. tubular cable lugs, 90° angle, 50mm²	2014631
KRF 50-8 90 GR	Std. tubular cable lugs, 90° angle, 50mm²	2014635
KRF 50-10 90 GR	Std. tubular cable lugs, 90° angle, 50mm²	2014636
KRF 50-12 90 GR	Std. tubular cable lugs, Cu 50mm² M10	2014637
KRF 70-6 90 GR	Std. tubular cable lugs, 90° angle, 70mm²	2014638
KRF 70-8 90 GR	Std. tubular cable lugs, 90° angle, 70mm²	2014642
KRF 70-10 90 GR	Std. tubular cable lugs, 90° angle, 70mm²	2014643
KRF 70-12 90 GR	Std. tubular cable lugs, 90° angle, 70mm²	2014644
KRF 95-8 90 GR	Std. tubular cable lugs, 90° angle, 95mm²	2014645
KRF 95-10 90 GR	Std. tubular cable lugs, 90° angle, 95mm²	2014650
KRF 95-12 90 GR	Std. tubular cable lugs, 90° angle, 95mm²	2014651

2 Product

KRF 120-10 90 GR	Std. tubular cable lugs, 90° angle, 120mm²	2014652
KRF 150-10 90 GR	Std. tubular cable lugs, 90° angle, 150mm²	2014656
KRF 150-12 90 GR	Std. tubular cable lugs, 90° angle, 150mm²	2014662
KRF 185-12 90 GR	Std. tubular cable lugs, 90° angle, 185mm²	2014663
KRF 240-12 90 GR	Std. tubular cable lugs, 90° angle, 240mm²	2014668
KRF 10-6-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	2014673
KRF 16-6-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	2014674
KRX 10-12	Cable lugs for excel-cable	2014675
KRT 6-10	KRT tubular cable lugs, Cu 6mm² M10	2016352
KRT 10-5	KRT tubular cable lugs, Cu 10mm² M5	2046625
KRT 10-6	KRT tubular cable lugs, Cu 10mm² M6	2046630
KRT 10-8	KRT tubular cable lugs, Cu 10mm² M8	2046634
KRT 10-10	KRT tubular cable lugs, Cu 10mm² M10	2046638
KRT 10-12	KRT tubular cable lugs, Cu 10mm² M12	2046642
KRT 16-5	KRT tubular cable lugs, Cu 16mm² M5	2046646
KRT 16-6	KRT tubular cable lugs, Cu 16mm² M6	2046658
KRT 16-8	KRT tubular cable lugs, Cu 16mm² M8	2046660
KRT 16-10	KRT tubular cable lugs, Cu 16mm² M10	2046664
KRT 16-12	KRT tubular cable lugs, Cu 16mm² M12	2046668
KRT 25-5	KRT tubular cable lugs, Cu 25mm² M5	2046670
KRT 25-6	KRT tubular cable lugs, Cu 25mm² M6	2046671
KRT 25-8	KRT tubular cable lugs, Cu 25mm² M8	2046672
KRT 25-10	KRT tubular cable lugs, Cu 25mm² M10	2046684
KRT 25-12	KRT tubular cable lugs, Cu 25mm² M12	2046688
KRT 25-16	KRT tubular cable lugs, Cu 25mm² M16	2046690
KRT 35-6	KRT tubular cable lugs, Cu 35mm² M6	2046692
KRT 35-8	KRT tubular cable lugs, Cu 35mm² M8	2046710
KRT 35-10	KRT tubular cable lugs, Cu 35mm² M10	2046714
KRT 35-12	KRT tubular cable lugs, Cu 35mm² M12	2046718
KRT 35-16	KRT tubular cable lugs, Cu 35mm² M16	2046720
KRT 50-6	KRT tubular cable lugs, Cu 50mm² M6	2046722
KRT 50-8	KRT tubular cable lugs, Cu 50mm² M8	2046726
KRT 50-10	KRT tubular cable lugs, Cu 50mm² M10	2046730
KRT 50-12	KRT tubular cable lugs, Cu 50mm² M12	2046734
KRT 50-16	KRT tubular cable lugs, Cu 50mm² M16	2046738
KRT 70-6	KRT tubular cable lugs, Cu 70mm² M6	2046740
KRT 70-8	KRT tubular cable lugs, Cu 70mm² M8	2046748
KRT 70-10	KRT tubular cable lugs, Cu 70mm² M10	2046750
KRT 70-12	KRT tubular cable lugs, Cu 70mm² M12	2046754
KRT 70-16	KRT tubular cable lugs, Cu 70mm² M16	2046758
KRT 95-6	KRT tubular cable lugs, Cu 95mm² M6	2046760
KRT 95-8	KRT tubular cable lugs, Cu 95mm² M8	2046766
KRT 95-10	KRT tubular cable lugs, Cu 95mm² M10	2046768
KRT 95-12	KRT tubular cable lugs, Cu 95mm² M12	2046770
KRT 95-16	KRT tubular cable lugs, Cu 95mm² M16	2046774
KRT 120-6	KRT tubular cable lugs, Cu 120mm² M6	2046778
KRT 120-8	KRT tubular cable lugs, Cu 120mm² M8	2046786
KRT 120-10	KRT tubular cable lugs, Cu 120mm² M10	2046788
KRT 120-12	KRT tubular cable lugs, Cu 120mm² M12	2046790
KRT 120-16	KRT tubular cable lugs, Cu 120mm² M16	2046794
KRT 120-20	KRT tubular cable lugs, Cu 120mm² M20	2046798
KRT 150-10	KRT tubular cable lugs, Cu 150mm² M10	2046800
KRT 150-12	KRT tubular cable lugs, Cu 150mm² M12	2046808
KRT 150-16	KRT tubular cable lugs, Cu 150mm² M16	2046810
KRT 150-20	KRT tubular cable lugs, Cu 150mm² M20	2046814
KRT 185-10	KRT tubular cable lugs, Cu 185mm² M10	2046818
KRT 185-12	KRT tubular cable lugs, Cu 185mm² M12	2046828
KRT 185-16	KRT tubular cable lugs, Cu 185mm² M16	2046830
KRT 185-20	KRT tubular cable lugs, Cu 185mm² M20	2046834
KRT 240-12	KRT tubular cable lugs, Cu 240mm² M12	2046838

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KRT 240-16	KRT tubular cable lugs, Cu 240mm² M16	2046848
KRT 240-20	KRT tubular cable lugs, Cu 240mm² M20	2046850
KRT 300-12	KRT tubular cable lugs, Cu 300mm² M12	2046854
KRT 300-16	KRT tubular cable lugs, Cu 300mm² M16	2046866
KRT 300-20	KRT tubular cable lugs, Cu 300mm² M20	2046868
KRT 400-12	KRT tubular cable lugs, Cu 400mm² M12	2046870
KRT 400-16	KRT tubular cable lugs, Cu 400mm² M16	2046886
KRT 400-20	KRT tubular cable lugs, Cu 400mm² M20	2046888
KR 2,5-4 90GR-SP	Special cable lugs angle, CC-7mm	2046890
KR 2,5-4 G	Std. tubular cable lugs, Cu 2,5mm². Fork	--
KR 2,5-6 90GR	Special. 90° tubular cable lugs, Cu 2,5mm²	--
KR 4-5-2 CC16	Tubular cable lugs, 4-6mm² with 2 holes, CC=16	--
KR 4-6-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	--
KR 6-5 90 GR	Std. tubular cable lugs, 90° angle, 6mm²	--
KR 6-8 45 GR	Std. tubular cable lugs, 45° angle, 6mm²	--
KR 6-8 G	Std. tubular cable lugs, Cu 6mm². Fork	--
KRD 630-20	Thin-walled tubular cable lugs, Cu	--
KRF 10-4 90 GR	Std. tubular cable lugs, 90° angle, 10mm²	--
KRF 10-5 90GR	Tubular cable lugs, in angle	--
KRF 10-6-2 CC12,5	Std tubular cable lugs, with 2 holes, CC=12,5	--
KRF 10-8 90 GR	Std. tubular cable lugs, 90° angle, 10mm²	--
KRF 120-10 45 GR	Std. tubular cable lugs, 45° angle, 120mm²	--
KRF 120-12 45 GR	Std. tubular cable lugs, 45° angle, 120mm²	--
KRF 120-12 90 GR	Std. tubular cable lugs, 90° angle, 120mm²	--
KRF 120-12-2 CC40	Std tubular cable lugs, with 2 holes, CC=40	--
KRF 120-16 45 GR	Std. tubular cable lugs, 45° angle, 120mm²	--
KRF 120-16 90 GR	Special tubular cable lugs, 90° angle, 120mm²	--
KRF 120-20	Std. tubular cable lugs, Cu 120mm² M20	--
KRF 150-10 45 GR	Std. tubular cable lugs, 45° angle, 150mm²	--
KRF 150-10-2 CC26	Std tubular cable lugs, with 2 holes, CC=26	--
KRF 150-12-2 CC26	Std tubular cable lugs, with 2 holes, CC=26	--
KRF 150-12-2 CC40	Std tubular cable lugs, with 2 holes, CC=40	--
KRF 150-16 90 GR	Std. tubular cable lugs, 90° angle, 150mm²	--
KRF 16-10 G	Std. tubular cable lugs, Cu 16mm², Fork	--
KRF 16-4	Std. tubular cable lugs, Cu 16mm² M4	--
KRF 16-6 45 GR	Std. tubular cable lugs, 45° angle, 16mm²	--
KRF 16-6-2 CC16 90 GR	Std tubular cable lugs, with 2 holes, CC=16, angle, 16mm²	--
KRF 16-6-2 CC19	Std tubular cable lugs, with 2 holes, CC=19	--
KRF 16-8 90 POW	Std. tubular cable lugs,90°,long splice,16mm²	--
KRF 16-8-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	--
KRF 16-8-2 CC16 90GR	Tubular cable lugs,2-holess, CC=16, 90 degrees	--
KRF 185-00	Std. tubular cable lugs, Cu 185mm², undrilled	--
KRF 185-14-2 CC40	Std tubular cable lugs, with 2 holes, CC=38	--
KRF 240-12 45 GR	Special	--
KRF 240-12-2 CC35	Std tubular cable lugs, with 2 holes, CC=35	--
KRF 240-14-2 cc40	Std tubular cable lugs, with 2 holes, CC=40	--
KRF 240-16 45 GR	Std. tubular cable lugs, 45° angle, 240mm²	--
KRF 240-6	Std. tubular cable lugs, Cu 240mm² M6	--
KRF 25-10-2 CC26	Std tubular cable lugs, 2 holes, CC=26	--
KRF 25-10-2 CC26 90 GR	Std tubular cable lugs, 2 holes, CC=26, 90°	--
KRF 25-4	Std. tubular cable lugs, Cu 25mm² M4	--
KRF 25-6 90 POW	Std. tubular cable lugs, 90° 35mm angle, 25mm²	--
KRF 25-6-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	--
KRF 25-6-2 CC19	Std tubular cable lugs, with 2 holes, CC=19	--
KRF 25-8 45 GR	Std. tubular cable lugs, 45° angle, 25mm²	--
KRF 25-8 90 POW	KRF tubular cable lugs, angle, special	--
KRF 25-8-2 CC22	Std tubular cable lugs, with 2 holes, CC=22	--

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KRF 300-14-2 CC45	Std tubular cable lugs, with 2 holes, CC=45	--
KRF 300-16-2 CC38	Std tubular cable lugs, with 2 holes, CC=38	--
KRF 35-10 45 GR	Std. tubular cable lugs, 45° angle, 35mm²	--
KRF 35-12 90 GR	Std. tubular cable lugs, 90° angle, 35mm²	--
KRF 35-6 45 GR	Std. tubular cable lugs, 45° angle, 35mm²	--
KRF 35-6 90 ELT	KRF tubular cable lugs, angle, special	--
KRF 35-6 90 POW	KRF tubular cable lugs, angle, special	--
KRF 35-6-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	--
KRF 35-8 90 gr spesial	KRF tubular cable lugs, angle, bent cc=37	--
KRF 35-8 90 POW	KRF tubular cable lugs, angle, special	--
KRF 35-8-2 CC22	Std tubular cable lugs, with 2 holes, CC=22	--
KRF 400-00	Std. tubular cable lugs, Cu 400mm², undrilled	--
KRF 400-12-2 45gr	Tubular cable lugs, 45° angle, 400mm² M12 with 2 holes CC40	--
KRF 400-16-2 CC50	Std tubular cable lugs, with 2 holes, CC=50	--
KRF 400-24	Std. tubular cable lugs, Cu 400mm² M24	--
KRF 500-12	Std. tubular cable lugs, Cu 500mm² M12	--
KRF 500-16	Std. tubular cable lugs, Cu 500mm² M16	--
KRF 50-10 45 GR	Std. tubular cable lugs, 45° angle, 50mm²	--
KRF 50-6 90 POW	KRF tubular cable lugs, angle, special	--
KRF 50-6-2 CC19	Std tubular cable lugs, with 2 holes, CC=19	--
KRF 50-8 45 GR	Std. tubular cable lugs, 45° angle, 50mm²	--
KRF 50-8 90 POW	KRF tubular cable lugs, angle, special	--
KRF 50-8-2 CC22	Std tubular cable lugs, with 2 holes, CC=22	--
KRF 630-00	Std. tubular cable lugs, Cu 630mm², undrilled	--
KRF 630-12	Std. tubular cable lugs, Cu 630mm² M12	--
KRF 70-10 45 GR	Std. tubular cable lugs, 45° angle, 70mm²	--
KRF 70-10 UF	Std. tubular cable lugs, untinned, 70mm²	--
KRF 70-10-2 CC25	Std tubular cable lugs, with 2 holes, CC=25	--
KRF 70-12-2 CC40	Std tubular cable lugs, with 2 holes, CC=40	--
KRF 70-16 90 GR	Std. tubular cable lugs, 90° angle, 70mm²	--
KRF 70-8 45 GR	Std. tubular cable lugs, 45° angle, 70mm²	--
KRF 70-8 90 POW	KRF tubular cable lugs, angle, special	--
KRF 70-8-2 CC16	Std tubular cable lugs, with 2 holes, CC=16	--
KRF 70-8-2 CC26	Std tubular cable lugs, with 2 holes, CC=26	--
KRF 800-00	Std. tubular cable lugs, Cu 800mm², undrilled	--
KRF 95-10 45 GR	Std. tubular cable lugs, 45° angle, 95mm²	--
KRF 95-10-2 CC25	Std tubular cable lugs, with 2 holes, CC=25	--
KRF 95-12 45 GR	Std. tubular cable lugs, 45° angle, 95mm²	--
KRF 95-12-2 CC38	Std tubular cable lugs, with 2 holes, CC=38	--
KRF 95-12-2 CC40	Std tubular cable lugs, with 2 holes, CC=40	--
KRF 95-6	Std. tubular cable lugs, Cu 95mm² M6	--
KRF 95-6 45 GR	Std. tubular cable lugs, 45° angle, 95mm²	--
KRFA 240-12-2	Std tubular cable lugs, with 2 holes, CC=40	--
KRFA 300-12-2 CC40	Tubular cable lugs, KRFA (32 Grounding clamp) CC=40	--
KRFA 300-16-2 CC45	Tubular cable lugs, KRFA (32 Grounding clamp) CC=40	--
KRFA 400-12-2 CC40	Tubular cable lugs, KRFA (38 Grounding clamp) CC=40	--
KRFA 400-20	Tubular cable lugs, KRFA (38 Grounding clamp)	--
KRT 10-10 90GR	KRT tubular cable lugs, Cu 10mm² M10 90°	--
KRT 10-4	KRT tubular cable lugs, Cu 10mm² M4	--
KRT 10-4 70 GR	KRT tubular cable lugs, 70° angle, 10mm²	--
KRT 10-4 90 GR	KRT tubular cable lugs, 90° angle, 10mm²	--
KRT 10-8 90GR	KRT angle cable lugs, Cu 10mm² M8	--
KRT 120-10 45 GR	KRT tubular cable lugs, 45° angle, 120mm²	--
KRT 120-10 90 GR	KRT tubular cable lugs, 90° angle, 120mm²	--
KRT 120-12 45 GR	KRT tubular cable lugs, 45° angle, 120mm²	--

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KRT 120-12 90 GR	KRT tubular cable lugs, 90° angle, 120mm²	--
KRT 120-16 90GR	KRT 90° angle cable lugs, Cu 120mm² M16	--
KRT 120-20 90 GR	KRT tubular cable lugs, 90° angle, 120mm²	--
KRT 150-10 45 GR	KRT tubular cable lugs, 45° angle, 150mm²	--
KRT 150-10 90 GR	KRT tubular cable lugs, 90° angle, 150mm²	--
KRT 150-12 45 GR	KRT tubular cable lugs, 45° angle, 150mm²	--
KRT 150-12 90 GR	KRT tubular cable lugs, 90° angle, 150mm²	--
KRT 150-8	KRT tubular cable lugs, Cu 150mm² M8	--
KRT 16-4 70 GR	KRT tubular cable lugs, 70° angle, 16mm²	--
KRT 16-6-2 CC16	KRT tubular cable lugs, with 2 holes, CC=16	--
KRT 16-6-2 CC16 90GR	KRT tubular cable lugs, 2 holes, CC=16 90GR	--
KRT 16-8 45 GR	KRT tubular cable lugs, 45° angle, 16mm²	--
KRT 16-8 90 GR	KRT tubular cable lugs, 90° angle, 16mm²	--
KRT 185-12 90 GR	KRT tubular cable lugs, 90° angle, 185mm²	--
KRT 240-12-2 CC44	KRT tubular cable lugs, with 2 holes, CC=44	--
KRT 25-8 90 GR	KRT tubular cable lugs, 90° angle, 25mm²	--
KRT 300-10	KRT tubular cable lugs, Cu 300mm² M10	--
KRT 35-10 45 GR	KRT tubular cable lugs, 45° angle, 35mm²	--
KRT 35-20	KRT tubular cable lugs, Cu 35mm² M20	--
KRT 35-6 90 GR	KRT tubular cable lugs, 90° angle, 35mm²	--
KRT 35-8 90 GR	KRT tubular cable lugs, 90° angle, 35mm²	--
KRT 400-12-2 CC40	KRT tubular cable lugs, with 2 holes, CC=40	--
KRT 50-10 45 GR	KRT tubular cable lugs, 45° angle, 50mm²	--
KRT 50-10 90 GR	KRT tubular cable lugs, 90° angle, 50mm²	--
KRT 50-20	KRT tubular cable lugs, Cu 50mm² M20	--
KRT 50-6 45 GR	KRT tubular cable lugs, 45° angle, 50mm²	--
KRT 50-6 90 GR	KRT tubular cable lugs, 90° angle, 50mm²	--
KRT 50-8 45 GR	KRT tubular cable lugs, 45° angle, 50mm²	--
KRT 70-10 45 GR	KRT tubular cable lugs, 45° angle, 70mm²	--
KRT 70-10 90 GR	KRT tubular cable lugs, 90° angle, 70mm²	--
KRT 70-12 45 GR	KRT tubular cable lugs, 45° angle, 70mm²	--
KRT 70-12 90 GR	KRT tubular cable lugs, 90° angle, 70mm²	--
KRT 70-20	KRT tubular cable lugs, Cu 70mm² M20	--
KRT 70-6 90 GR	KRT tubular cable lugs, 90° angle, 70mm²	--
KRT 70-8 45GR	KRT angle cable lugs, Cu 70mm² M8	--
KRT 70-8 90 GR	KRT tubular cable lugs, 90° angle, 70mm²	--
KRT 95-10 90 GR	KRT tubular cable lugs, 90° angle, 95mm²	--
KRT 95-12 45 GR	KRT tubular cable lugs, 45° angle, 95mm²	--
KRT 95-12 90 GR	KRT tubular cable lugs, 90° angle, 95mm²	--
KRT 95-20	KRT tubular cable lugs, Cu 95mm² M20	--
KRT 95-6 90 gr	KRT tubular cable lugs, Cu 95mm² M6 90 degrees	--
KRT 95-8 45 GR	KRT tubular cable lugs, 45° angle, 95mm²	--
KRT 95-8 90 GR	KRT tubular cable lugs, 90° angle, 95mm²	--
KRTS 185-8	KRT tubular cable lugs, narrow splice 26mm	--
KRTS 35-8	KRT tubular cable lugs, narrow splice 15mm	--
KRTS 70-6 SPESIAL	KRT narrow splice, 7mm from edge to center	--
C-4	C-clamp 10mm²	2013014
C-5	C-clamp 16mm²	2013026
C-6	C-clamp 25mm²/25-2x2,5 mm²	2013030
C-6-3	C-clamp 25/6mm²	2013031
C-8-6	C-clamp 35-25/25-16	2013034
C-8	C-clamp 35mm²	2013038
C-9-6	C-clamp 50-35/25-16	2013042
C-9-8	C-clamp 50-35/35-25	2013046
C-9	C-clamp 50mm²	2013048
C-11-8	C-clamp 70-50/35-25	2013050
C-11-9	C-clamp 70-50/50-35	2013054
C-11	C-clamp 70mm²	2013058
C-13-8	C-clamp 95-70/35-25	2013062

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C-13-9	C-clamp 95-70/50-35	2013066
C-13-11	C-clamp 95-70/70-50	2013070
C-13	C-clamp 95mm²	2013074
C-15-8	C-clamp 120-95/35-25	2013078
C-15-9	C-clamp 120-95/50-35	2013082
C-15-11	C-clamp 120-95/70-50	2013086
C-15-13	C-clamp 120-95/95-70	2013090
C-15	C-clamp 120mm²	2013094
C-16-9	C-clamp 150-120/50-35	2013096
C-16-13	C-clamp 150-120/95-70	2013097
C-16	C-clamp 150mm²	2013098
C-89	C-clamp covers 12-100mm² total 6mm² smallest	2014033

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The applications of cable lugs and C-clamps are extensive, covering various electrical uses in industrial, utility, rail, automotive and domestic machinery and systems. To use cable lugs or C-clamps, the stripped end of a wire is inserted into the barrel of the lug, which is then crimped with special certified tools to secure the connection. The purpose of the product is to ensure efficient electrical conductivity.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

This statement is based on the experience of Ingeniørfirma ABIKO Norsk AS and is further supported by similar Environmental Product Declarations (EPDs) available within the industry.

USED RSL (YR) IN THIS LCA CALCULATION:

80

2.4 TECHNICAL DATA

The environmental impacts are from production and transportation for the listed cable lugs and C-clamps. Full information of the products performances are published in the International Electrotechnical Commission (IEC) 61238-1-3 tests. The cable lug samples and C-clamps were tested at SINTEF and certified by DNV.

This EPD represents a worst-case scenario, covering the largest and heaviest product variant within the product range. All other variations of cable lugs and C-clamps that are smaller in size and weight and all produced at the same locations described in the production process, are also included within the scope of this declaration. A conversion factor of 0,57 is provided to scale the results for smaller product sizes.

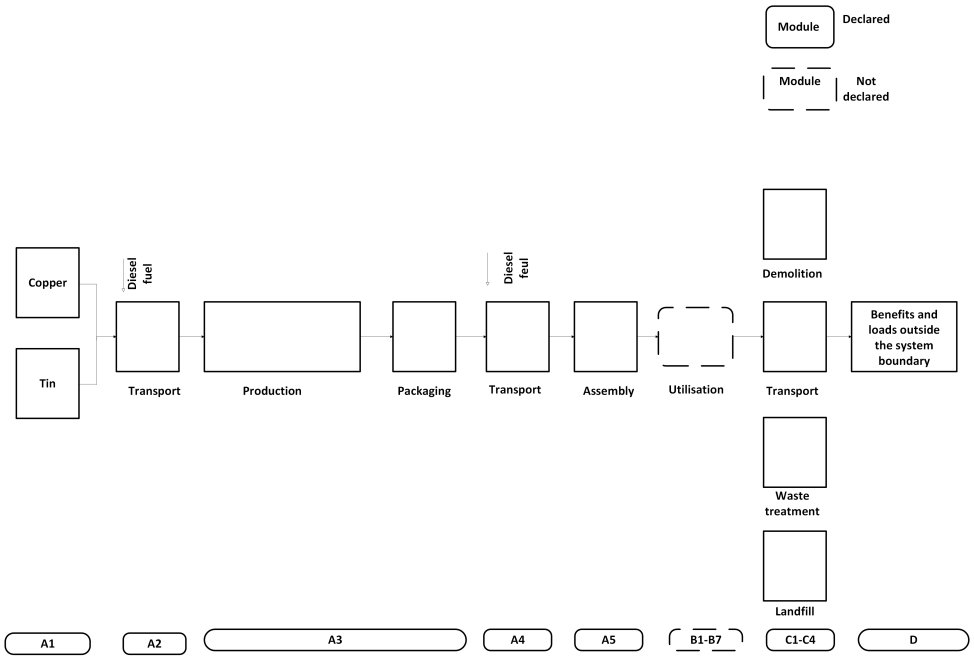
2.5 SUBSTANCES OF VERY HIGH CONCERN

None of the substances contained in the product with a content of more than 0,1 % of the total weight is on the “List of Substances of Very High Concern” (SVHC) that are eligible for authorization under the REACH Regulation.

2.6 DESCRIPTION PRODUCTION PROCESS

The process begins with the production of raw materials, copper and tin. The copper is then formed into tubes. These tubes are transported to a facility where they are pressed into tubular cable lugs and C-clamps ranging from 0,75 to 800 mm². The tin, which is a recycled product, is alloyed onto the copper tubes. Finally, the finished product is transported to Ingeniørfirma ABIKO Norsk AS warehouse in Oslo.

2 Product


Module
Declared
Module
Not declared
Copper
Tin
Diesel fuel
Transport
Production
Packaging
Diesel feul
Transport
Assembly
Utilisation
Demolition
Transport
Benefits and loads outside the system boundary
Waste treatment
Landfill
A1
A2
A3
A4
A5
B1-B7
C1-C4
D

3 Calculation rules

3.1 DECLARED UNIT

1 piece of Abiko Cable lugs and C-clamps

The declared unit is 1 piece of cable lugs. All other variations of cable lugs and C-clamps that are smaller in size and weight are also included within the scope of this declaration.

Reference unit: piece (p)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	p
Weight per reference unit	1,752	kg
Conversion factor to 1 kg	0,570718	p

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options, modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for Cable lugs, a product of Abiko. The results of this EPD are representative for Norway, UK, and the EU.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do

3 Calculation rules

therefore not exceed the limit of 5% of energy use and mass. The packaging material is transported from the supplier Christer Nöjd AB by lorry and with a distance of 483 km.

Transport to the Construction (A4)

All input flows (transportation to the construction site) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

Excluded Elements from LCA Calculation

- Capital goods
- Personnel transportation
- Research and development activities;
- Long-term emissions.

3.6 ALLOCATION

Allocation has not been applied in this LCA.

3.7 DATA COLLECTION & REFERENCE PERIOD

Data is collected from Ingeniørfirma ABIKO norsk AS for the reference period of 1 year from Jan 2024 to December 2024. The EPD consist of modules A1-A4, C1-C4 and D.

3.8 ESTIMATES AND ASSUMPTIONS

The product is assumed to have a lifespan of 80 years, based on Abiko's experience and the lifespan of the components to which the cable lugs or C-clamps are connected

The customers are primarily located in Scandinavia. The transport distance to these customers was estimated based on the average distance from Abiko's office to the central regions of Norway, Sweden, Denmark, and Finland.

To calculate the surface area (m^2) of the cable lugs and C-clamps, a rectangular approximation is used. This method is chosen due to the complex geometry of the products, making precise surface measurement difficult. The calculation is based on the largest and heaviest product variant to ensure that the estimated area fully encompasses all smaller variants. The surface area is determined using the formula:
Area = Length × Width.

All scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

3.9 DATA QUALITY

Data was collected for the 2024 -2025 operating year and is therefore up to date. The values are based on the annual average. To ensure the comparability of the results, only consistent background data from the Ecoinvent database v3.9.1 was used in the LCA (e.g. data records for energy, transport and process materials), which relate to the reference year 2019. The database is checked regularly and therefore complies with the requirements of EN 15804 (background data not older than 10 years). All consistent data sets contained in the Ecoinvent database are documented and can be viewed in the Ecoinvent online documentation.

The quality of the data used for this EPD can be divided into three categories according to the criteria of the UN Global Environmental Guideline for the Development of a Life Cycle Assessment Database (as described in EN 15804+A2).

The quality level of geographical representativeness can be considered ‘Good’, the quality level of technical representativeness can be considered ‘Good’ and the temporal representativeness can also be considered ‘good’. Therefore, the overall data quality for this EPD can be described as ‘good’

3 Calculation rules

3.10 POWER MIX

The energy used for assembling the components is included in the environmental profiles. Abiko receives a fully processed product and does not modify it in any way before delivering it to their customer.

However, to represent the processes involved to produce the product, standard datasets have been used, and within those datasets, different electricity sources are used, which are the following:

Electricity mix	GWP-total per kWh in kq CO2 eq.
Market group for electricity, low voltage (RER)	0,363
Market for electricity, low voltage (AU)	0,930
Market for electricity, low voltage (NZ)	0,151
Market for electricity, low voltage (RAF)	0,847
Market for electricity, low voltage (RAS)	0,978
Market for electricity, low voltage (RLA)	0,406
Market for electricity, low voltage (RNA)	0,459
Market group for electricity, medium voltage (RER)	0,357

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Distance	525 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.2 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.3 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable

4 Scenarios and additional technical information

Volume capacity utilisation factor	1

4.4 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	EU	0	5	0	95	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.000	0.088	0.000	1.665	0.000
Total	**0.000**	**0.088**	**0.000**	**1.665**	**0.000**

4.5 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	1.665	0.000
Total	**1.665**	**0.000**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER PIECE

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.79E+1	7.35E-1	1.86E-1	1.88E+1	1.43E-1	0.00E+0	1.37E-2	1.48E-1	9.34E-4	-1.01E+1
GWP-f	kg CO_2 eq.	1.76E+1	7.34E-1	2.90E-1	1.86E+1	1.42E-1	0.00E+0	1.37E-2	4.31E-2	9.32E-4	-1.01E+1
GWP-b	kg CO_2 eq.	2.19E-1	1.87E-4	-1.05E-1	1.14E-1	4.63E-5	0.00E+0	4.45E-6	1.05-1	1.37E-6	-3.18E-2
GWP-luluc	kg CO_2 eq.	3.23E-2	1.47E-3	8.61E-4	3.46E-2	5.06E-4	0.00E+0	4.87E-5	6.32E-5	2.25E-7	-2.09E-2
ODP	kg CFC 11 eq.	3.08E+2	1.20E-8	1.84E+1	3.27E+2	2.53E-9	0.00E+0	2.43E-10	6.85E-10	2.71E-11	-1.29E-7
AP	mol H+ eq.	1.21E+0	1.38E-2	-1.51E-2	1.21E+0	6.80E-4	0.00E+0	6.54E-5	4.83E-4	6.07E-6	-1.26E+0
EP-fw	kg P eq.	4.67E-2	4.84E-6	2.52E-3	4.93E-2	1.41E-6	0.00E+0	1.36E-7	1.97E-6	7.85E-9	-3.41E-3
EP-m	kg N eq.	1.29E-2	3.64E-3	-1.99E-3	1.45E-2	2.58E-4	0.00E+0	2.48E-5	1.10E-4	2.55E-6	-4.13E-2
EP-T	mol N eq.	1.84E-1	4.01E-2	-3.14E-2	1.92E-1	2.76E-3	0.00E+0	2.65E-4	1.26E-3	2.76E-5	-6.15E-1
POCP	kg NMVOC eq.	5.13E-2	1.13E-2	-1.00E-2	5.26E-2	9.41E-4	0.00E+0	9.05E-5	3.77E-4	1.03E-5	-1.94E-1
ADP-mm	kg Sb-eq.	1.47E+2	1.41E-6	8.72E+0	1.56E+2	4.45E-7	0.00E+0	4.28E-8	2.66E-6	2.27E-9	-1.80E-2
ADP-f	MJ	7.13E+1	9.66E+0	-4.62E+0	7.64E+1	2.03E+0	0.00E+0	1.96E-1	5.85E-1	2.13E-2	-1.22E+2
WDP	m3 world eq.	2.85E+0	3.66E-2	-1.07E+0	1.82E+0	1.11E-2	0.00E+0	1.07E-3	7.09E-3	9.72E-5	-1.85E+1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

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ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
PM	disease incidence	9.04E+2	4.39E-8	5.41E+1	9.58E+2	1.40E-8	0.00E+0	1.35E-9	6.62E-9	1.48E-10	-2.22E-6
IR	kBq U235 eq.	2.37E-1	2.85E-3	-2.53E-2	2.15E-1	7.93E-4	0.00E+0	7.63E-5	1.56E-3	3.06E-5	-4.71E-1
ETP-fw	CTUe	4.80E+2	5.90E+0	-4.68E+1	4.39E+2	1.50E+0	0.00E+0	1.44E-1	4.59E-1	7.49E-1	-1.02E+3
HTP-c	CTUh	6.67E-1	3.49E-10	3.98E-2	7.07E-1	7.52E-11	0.00E+0	7.23E-12	6.58E-11	9.67E-13	-2.14E-7
HTP-nc	CTUh	3.10E-6	5.17E-9	-1.14E-6	1.96E-6	1.63E-9	0.00E+0	1.57E-10	2.96E-9	7.29E-11	-1.93E-5
SQP	Pt	8.68E+1	4.03E+0	-1.39E+1	7.69E+1	1.60E+0	0.00E+0	1.54E-1	1.04E+0	5.06E-2	-3.96E+2

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

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ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	5.49E+1	1.01E-1	8.13E-1	5.58E+1	2.87E-2	0.00E+0	2.76E-3	9.07E-2	1.42E-3	-3.75E+1
PERM	MJ	0.00E+0	0.00E+0	1.01E+0	1.01E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	5.49E+1	1.01E-1	1.82E+0	5.68E+1	2.87E-2	0.00E+0	2.76E-3	9.07E-2	1.42E-3	-3.75E+1
PENRE	MJ	2.18E+2	9.67E+0	3.97E+0	2.32E+2	2.04E+0	0.00E+0	1.96E-1	5.85E-1	2.13E-2	-1.22E+2
PENRM	MJ	0.00E+0	0.00E+0	1.22E-1	1.22E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	2.18E+2	9.67E+0	4.09E+0	2.32E+2	2.04E+0	0.00E+0	1.96E-1	5.85E-1	2.13E-2	-1.22E+2
SM	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	4.19E-1	1.52E-3	-4.06E-3	4.17E-1	4.91E-4	0.00E+0	4.73E-5	2.90E-4	2.67E-5	-4.31E-1

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 | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

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OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
HWD	Kg	7.69E-4	5.45E-5	2.21E-5	8.46E-4	1.30E-5	0.00E+0	1.25E-6	3.24E-6	9.88E-8	-3.79E-4
NHWD	Kg	6.66E+0	3.19E-1	7.09E-2	7.05E+0	1.34E-1	0.00E+0	1.29E-2	1.76E-2	8.78E-2	-5.94E+0
RWD	Kg	4.87E-4	1.61E-6	5.06E-6	4.94E-4	4.65E-7	0.00E+0	4.48E-8	1.18E-6	1.67E-8	-2.80E-4

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	9.92E-2	9.92E-2	0.00E+0	0.00E+0	0.00E+0	1.66E+0	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

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5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER PIECE

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per piece:

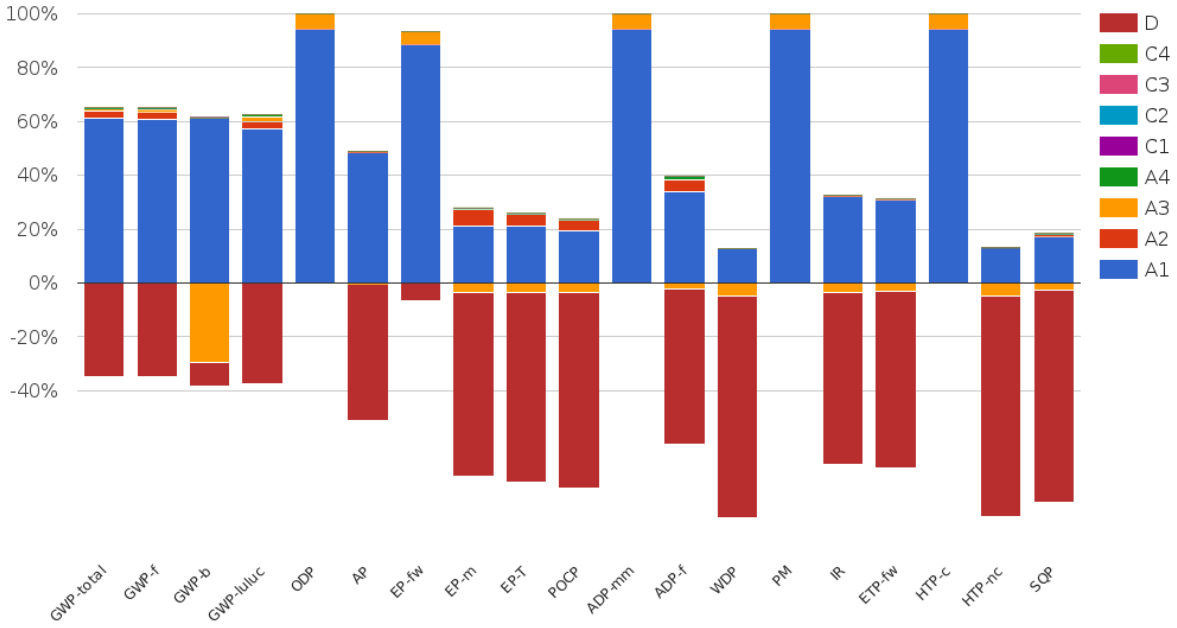
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.02911	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.1067	kg CO2 (biogenic)

6 Interpretation of results



As shown in the figure, the raw material stage (A1) and transport stage (A3) exhibit the most significant environmental impacts and core indicators. The construction stage (A4), which includes packaging, has a smaller environmental effect. The end-of-life stage (C1-C4) also has a minimal environmental impact. The disposal stage (D) accounts for the environmental benefits and burdens from the reuse, recycling, or energy recovery of materials at the end of the product's life cycle. The benefits are significant due to the components being made of pure copper and tin, which have substantial environmental advantages when recycled. Due to the product's simplicity, recycling the metals is a straightforward process.

This EPD follows a cradle-to-grave with options approach, covering the scope of raw material supply (A1-A3), transport to the site (A4), end-of-life processes (C1-C4), and disposal (D).

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment – Requirements and guidelines; EN ISO 14040:2006

ISO 14025
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Kiwa-EE GPI R.2.0
Kiwa-Ecobility Experts, General Programme Instructions "Product Level", SOP EE 1203_R. 2.0 (27.02.2025)

Kiwa-EE GPI R.2.0 Annex B1
Kiwa-Ecobility Experts, General Programme Instructions "Product Level" – Annex B1 Environmental Information Programme according to EN 15804/ISO 21930, SOP EE 1203_R. 2.0 (27.02.2025)

General PCR Ecobility Experts
Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

PCR B
The Norwegian EPD Foundation - NPCR 013 Part B for Steel and Aluminium Construction Products (references to EN 15804 +A2).

Ecoinvent
ecoinvent Version 3.9.1 (December 2022)

Characterisation method
Characterisation method Environmental Footprint 3.1

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