

Appendix

DATA INPUT

Location
Rome

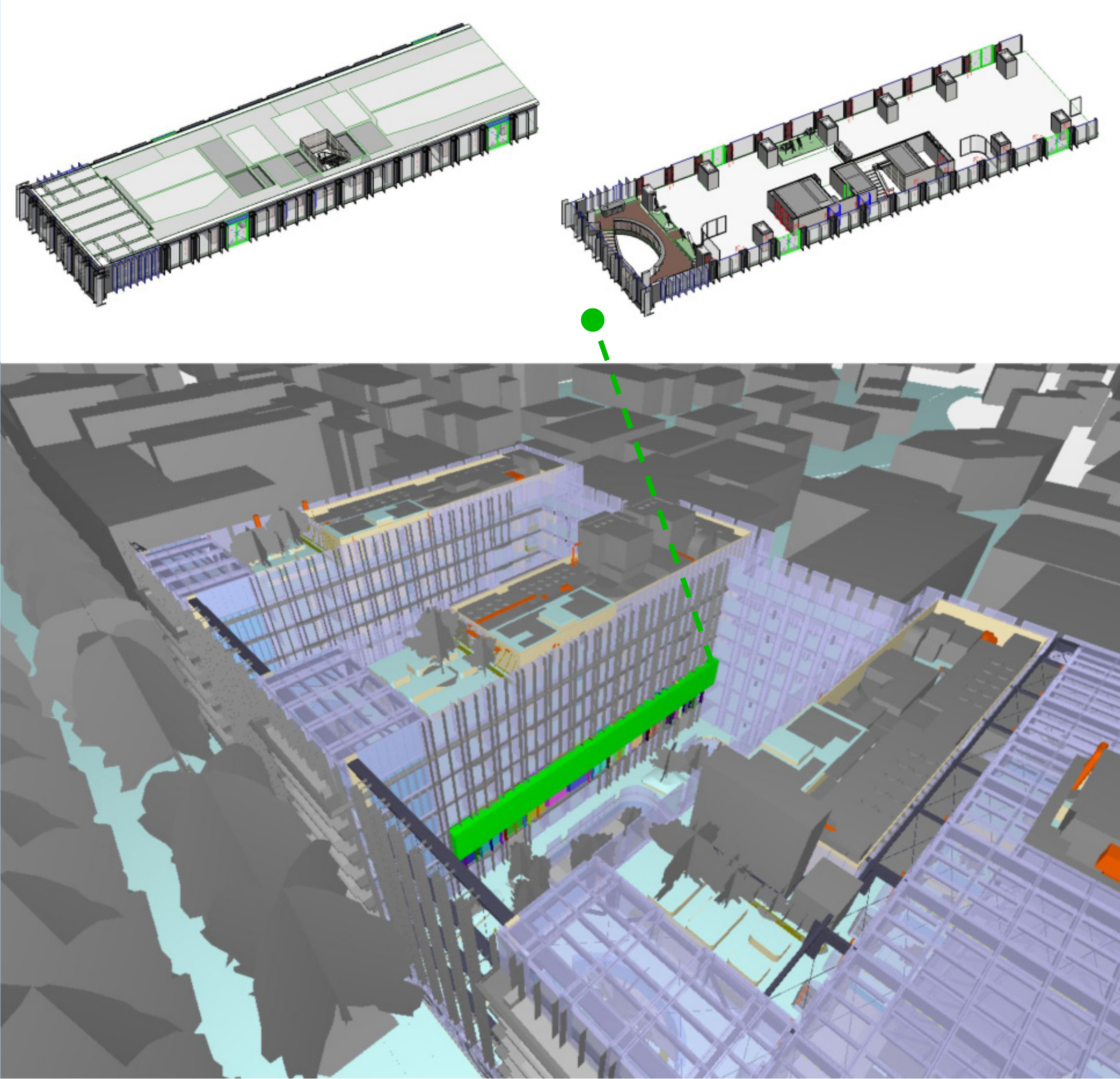
Gross Area
640,386 m²

Building Life
years 60

Boundaries
Cradle to grave, inclusive of biogenic carbon; see appendix for a full list of materials and processes

On-site Construction
21 kWh/m² electricity use
42 kWh/m² heating energy use
10000 liters/m² water use

Operational Energy
39,77 kWh/m² annual electricity use
49,32 kWh/m² annual heating energy use



Acoustic tile (ACT), mineral fiber board 410.6 kg
Used in the following Revit families:
Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 410.6 kg (60 yrs)
Used in the following Tally entries:
Acoustic ceiling system, mineral fiber board
Description:
Mineral fiber board acoustic ceiling tile, 5/8" thick
Life Cycle Inventory:
100% Mineral fiber board
Product Scope:
Cradle to gate of panel only, excludes suspended grid system and installation hardware
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
100% landfilled (inert waste)
LCI Source:
DE: Mineral fibres ceiling boards (EN15804 A1-A3) ts (2017)

Aluminum siding 306.1 kg
Used in the following Revit families:
Basic Wall:WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 153.0 kg (60 yrs*)
WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 153.0 kg (60 yrs*)
Used in the following Tally entries:
Aluminum siding
Description:
Aluminum sheet stock (0.02" thickness) factory formed and cut. Entry exclusive of wood stud, separate weather barrier, or other support material.
Life Cycle Inventory:
100% Aluminum
Product Scope:
Cradle to gate, excluding any coatings
Transportation Distance:
By truck: 663 km
End-of-Life Scope:
95% recovered
5% landfilled (inert material)
Module D Scope:
Product has 65% scrap input while remainder is processed and credited as avoided burden
LCI Source:
US: Electricity grid mix ts (2014)
US: Lubricants at refinery ts (2014)
RNA: Primary Aluminum Ingot AA (2010)
RNA: Secondary Aluminum Ingot AA (2010)
RNA: Cold rolled Aluminum Ingot AA (2010)
DE: Aluminium sheet deep drawing (adjustable) ts (2017)

Aluminum, formed 121.0 kg
Used in the following Revit families:
Basic Wall:WA_CE_01_20mm_Alucobond Dark Grey 15.1 kg (60 yrs)
WA_CW_05_100mm_Freestanding Glass Partition System:11960663 17.3 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960668 24.5 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960693 9.4 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960699 18.8 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960746 9.9 kg (60 yrs*)
WA_CW_06_100mm_Freestanding Glass Partition System_Curved:11960675 13.0 kg (60 yrs*)
WA_CW_06_100mm_Freestanding Glass Partition System_Curved:11960697 13.0 kg (60 yrs*)
Used in the following Tally entries:
Aluminum, formed
Aluminum, honeycomb backer / substrate
Description:
Formed aluminum member. Data based on industry-wide EPD for cold-rolled aluminum from the Aluminum Association (EPD ID 4786092064.101.1).
Life Cycle Inventory:
100% Aluminum
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 663 km
End-of-Life Scope:
95% Recovered
5% Landfilled (inert material)
Module D Scope:
Product has 65% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RNA: Cold Rolled Aluminium ts/AA (2010) [EPD]
GLO: Steel sheet stamping and bending (5% loss) ts (2017)
US: Electricity grid mix ts (2014)
US: Lubricants at refinery ts (2014)
GLO: Compressed air 7 bar (medium power consumption) ts (2014)
RNA: Primary Aluminum Ingot AA/ts (2010)
RNA: Secondary Aluminum Ingot AA/ts (2010)

Anodized aluminum, sheet 170.1 kg
Used in the following Revit families:
Basic Wall:WA_CE_01_20mm_Alucobond Dark Grey 170.1 kg (60 yrs*)
Used in the following Tally entries:
Aluminum, sheet
Description:
Anodized aluminum sheet, formed and cut. Data based on industry-wide EPD for anodized aluminum from the Aluminum Extruders Council (EPD ID 11240237.101.1).
Life Cycle Inventory:
100% Anodized aluminum
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 663 km
End-of-Life Scope:
95% Recovered
5% Landfilled (inert material)
Module D Scope:
Product has 65% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RNA: Cold Rolled Aluminium ts/AA (2010) [EPD]
GLO: Steel sheet stamping and bending (5% loss) ts (2017)
RNA: Anodization of aluminum extrusion AEC/ts (2015) [EPD]
US: Electricity grid mix ts (2014)
US: Lubricants at refinery ts (2014)
GLO: Compressed air 7 bar (medium power consumption) ts (2014)
RNA: Primary Aluminum Ingot AA/ts (2010) [EPD]
RNA: Secondary Aluminum Ingot AA/ts (2010) [EPD]

Brick, generic 7,281.2 kg
Used in the following Revit families:
Basic Wall:WA_IW_16_120mm_Concrete Blockwork_EI60 6,350.1 kg (60 yrs)
Basic Wall:WA_IW_23_120mm_Concrete Blockwork_EI90 931.1 kg (60 yrs)
Used in the following Tally entries:
Brick
Description:
Common extruded brick, excludes mortar.
Life Cycle Inventory:
100% Fired brick
Product Scope:
Cradle to gate
excludes mortar
anchors, ties, and metal accessories outside of scope (<1% mass)
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
55% Recycled into coarse aggregate
45% Landfilled (inert material)
Module D Scope:
Avoided burden credit for coarse aggregate, includes grinding energy
LCI Source:
DE: Stoneware tiles, unglazed (EN15804 A1-A3) ts (2017)

Cement mortar, TCNA - EPD 405.3 kg
Used in the following Revit families:
Basic Wall:WA_FW_CE.01.03_15mm_Porcelain Stoneware Tiles Navona Tra... 214.9 kg (60 yrs)
WA_FW_CE.01.03_15mm_Porcelain Stoneware Tiles Navona Travertine Effect 190.4 kg (60 yrs)
Used in the following Tally entries:
Ceramic tile
Description:
Average cement mortar for tile installation, appropriate for use as thinset mortar.
Industry-wide EPD from the Tile Council of North America.
Life Cycle Inventory:
See EPD
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 500 km
End-of-Life Scope:
100% Landfilled
LCI Source:
EPD (US), Tile Council of North America (2016)
EPD Source:
4787109018.102.1
EPD Designation Holder:
Tile Council of North America (TCNA)
EPD Program Operator:
UL Environment
EPD Expiration:
30/09/2021

Closed cell, spray-applied polyurethane foam, SPFA - EPD 9.4 kg
Used in the following Revit families:
WA_EW_07_300mm_Rainscreen Cladding Partition 9.4 kg (60 yrs*)
Used in the following Tally entries:
Insulated metal wall panel, custom
Description:
High density insulation foam, inclusive of installation (foaming agent, energy). Core density 32-40 kg/m³ (2-2.5 pcf). Industry-wide EPD from the Spray Polyurethane Foam Alliance.
Life Cycle Inventory:
See EPD
Product Scope:
Cradle to gate, includes installation
Transportation Distance:
By truck: 1299 km
End-of-Life Scope:
100% Landfilled (plastic waste)
LCI Source:
US: Spray Foam Life Cycle - Medium Density 1 SPFA (2010)
EPD Source:
13CA29310.101.1
EPD Designation Holder:
Spray Polyurethane Foam Alliance
EPD Program Operator:
UL Environment
EPD Expiration:
10/10/2018

Cold formed structural steel 487.2 kg
Used in the following Revit families:
Basic Wall:WA_CE_02_15mm_Plasterboard 58.4 kg (60 yrs)
Basic Wall:WA_FW_WD.01.06_70mm_MDF Micro Perforated Sound Absorbing... 169.2 kg (60 yrs)
Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 178.6 kg (60 yrs)
Basic Wall:WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 65.2 kg (60 yrs)
Basic Wall:WA_IW_13_125mm_Plasterboard Partition_Hmax 4mt EI60 0.0 kg (60 yrs)
Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 0.0 kg (60 yrs)
Basic Wall:WA_IW_25_90mm_Plasterboard Wall Lining_Hmax 5mt EI60 0.0 kg (60 yrs)
WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 15.8 kg (60 yrs)
Used in the following Tally entries:
Steel, C-H-stud metal framing
Steel, C-stud metal framing with insulation
Description:
Cold-rolled or formed structural steel, such as used in steel studs.
Life Cycle Inventory:
100% Cold rolled steel
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 431 km
End-of-Life Scope:
98% Recovered
2% Landfilled (inert material)
Module D Scope:
Product has 16% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RNA: Steel finished cold rolled coil worldsteel (2007)
GLO: Steel sheet stamping and bending (5% loss) ts (2017)
US: Electricity grid mix ts (2014)
US: Lubricants at refinery ts (2014)
GLO: Compressed air 7 bar (medium power consumption) ts (2014)
GLO: Value of scrap worldsteel (2014)

Expanded polystyrene (EPS), board 444.4 kg
Used in the following Revit families:
Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 149.6 kg (50 yrs)
Basic Wall:WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 287.6 kg (50 yrs)
WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 7.2 kg (50 yrs)
Used in the following Tally entries:
Expanded polystyrene (EPS), board
Description:
EPS foam insulation board
Life Cycle Inventory:
100% Expanded polystyrene board
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 1299 km
End-of-Life Scope:
100% Landfilled (plastic waste)
LCI Source:
US: EPS-Foam (expanded polystyrene foam (PS 12)) incl. flame retardant (estimation) ts (2017)

Fasteners, stainless steel 3,694.3 kg
Used in the following Revit families:
Basic Wall:WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 0.1 kg (60 yrs)
Basic Wall:WA_FW_WC.01.03_2mm_Vinyl Wallcovering 3.5 kg (60 yrs)
Basic Wall:WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 3,595.3 kg (60 yrs*)
WA_EW_07_300mm_Rainscreen Cladding Partition 5.1 kg (60 yrs)
WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 0.1 kg (60 yrs)
WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 90.3 kg (60 yrs*)
Used in the following Tally entries:
Aluminum siding
Insulated metal wall panel, custom
Plastic siding, vinyl
Stainless Steel, Fasteners
Description:
Stainless steel part, appropriate for use as fasteners and specialized hardware (bolts, rails, clips, etc.). Data based on industry-wide EPDs for primary and secondary metal from the World Steel Association.
Life Cycle Inventory:
100% Stainless steel
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 1001 km
End-of-Life Scope:
98% Recovered
2% Landfilled (inert material)
Module D Scope:
Product has 58% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RER: Stainless steel Quarto plate (304) Eurofer (2010)
GLO: Steel turning ts (2017)
US: Electricity grid mix ts (2014)
RER: Stainless steel flat product (304) - value of scrap Eurofer (2010)

Fiberglass mat gypsum sheathing board 131.8 kg
Used in the following Revit families:
Basic Wall:WA_IW_33_30mm_Plasterboard Double Layer_EI60 131.8 kg (60 yrs)
Used in the following Tally entries:
Fiberglass mat gypsum sheathing
Description:
Fiberglass treated gypsum sheathing product appropriate for use in high-moisture environments.
Life Cycle Inventory:
92% Gypsum
8% Fiberglass mat
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
DE: Gypsum plaster board (Moisture resistant) (EN15804 A1-A3) ts (2017)
US: Fiberglass Duct Board NAIMA (2007)

Fluoropolymer coating, metal stock 8.3 kg
Used in the following Revit families:
Basic Wall:WA_CE_01_20mm_Alucobond Dark Grey 4.0 kg (60 yrs)
Basic Wall:WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 1.2 kg (60 yrs)
WA_EW_07_300mm_Rainscreen Cladding Partition 1.9 kg (60 yrs)
WA_FW_MT.02.03_15mm_Aluminum Finish Stainless Steel Effect 1.2 kg (60 yrs)
Used in the following Tally entries:
Aluminum siding
Aluminum, sheet
Insulated metal wall panel, custom
Description:
Standard fluoropolymer coating for metals. This entry is used as a part of the larger MCA EPD for Roll Formed Steel Panels (EPD ID 13CA27321.101.1).
Life Cycle Inventory:
100% Fluoropolymer coating
Product Scope:
Cradle to gate, including application
Transportation Distance:
N/A
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
US: Coil coating MCA (2010)
US: Electricity grid mix ts (2014)
US: Thermal energy from natural gas ts (2014)

Foil facing 17.3 kg
Used in the following Revit families:
Basic Wall:WA_CE_02_15mm_Plasterboard 0.1 kg (60 yrs)
Basic Wall:WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 2.9 kg (60 yrs)
Basic Wall:WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 12.7 kg (60 yrs)
Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 1.0 kg (60 yrs)
WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 0.1 kg (60 yrs)
WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 0.3 kg (60 yrs)
Used in the following Tally entries:
Wall board, gypsum
Description:

Aluminum foil facing to be linked with appropriate envelope products. Entry based on 7 micron foil.
Life Cycle Inventory:
100% Aluminum foil
Product Scope:
Cradle to gate
Transportation Distance:
N/A
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
EU-28: Aluminum foil ts (2017)

Glazing, monolithic sheet, tempered 1,871.3 kg
Used in the following Revit families:
WA_CW_05_100mm_Freestanding Glass Partition System:11960663 314.6 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960668 446.3 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960693 170.1 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960699 342.6 kg (60 yrs*)
WA_CW_05_100mm_Freestanding Glass Partition System:11960746 179.5 kg (60 yrs*)
WA_CW_06_100mm_Freestanding Glass Partition System_Curved:11960675 209.1 kg (60 yrs*)
WA_CW_06_100mm_Freestanding Glass Partition System_Curved:11960697 209.1 kg (60 yrs*)
Used in the following Tally entries:
Glazing, monolithic sheet
Description:
Tempered float glass. Note: this entry is appropriate for clear or tinted glass. Default thickness is 3 mm.
Life Cycle Inventory:
Tempered glazing
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 940 km
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
DE: Window glass simple (EN15804 A1-A3) ts (2017)
US: Electricity grid mix ts (2014)
US: Thermal energy from natural gas ts (2014)

Kraft paper 3.4 kg
Used in the following Revit families:
Basic Wall:WA_IW_24_15mm_Plaster 3.4 kg (60 yrs)
Used in the following Tally entries:
Portland cement stucco
Description:
Water vapor permeable paper backing
Life Cycle Inventory:
100% Kraft paper
Product Scope:
Cradle to gate, excludes adhesives, backings, or any additional coatings
Transportation Distance:
By truck: 641 km
End-of-Life Scope:
100% Landfilled (biodegradable material)
Module D Scope:
Accounts for recovered energy from landfill gas utilization
LCI Source:
EU-28: Kraft paper agg (2017)

Lime mortar (Mortar type K) 716.8 kg
Used in the following Revit families:
Basic Wall:WA_IW_16_120mm_Concrete Blockwork_EI60 625.2 kg (60 yrs)
Basic Wall:WA_IW_23_120mm_Concrete Blockwork_EI90 91.7 kg (60 yrs)
Used in the following Tally entries:
Brick
Description:
Lime mortar, traditionally used for historic masonry.
Life Cycle Inventory:
20-65% Sand
40-70% Limestone
5-15% Hydrated lime
7-15% Cement
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
55% Recycled into coarse aggregate
45% Landfilled (inert material)
Module D Scope:
Avoided burden credit for coarse aggregate, includes grinding energy
LCI Source:
DE: Light plaster (lime-cement) ts (2017)

Medium density fiberboard (MDF), AWC - EPD 677.7 kg
Used in the following Revit families:
Basic Wall:WA_FW_WD.01.06_70mm_MDF Micro Perforated Sound Absorbing... 677.7 kg (60 yrs*)
Used in the following Tally entries:
Medium density fiberboard (MDF)
Description:
Generic Medium Density Fiberboard (MDF), engineered monolithic wood sheet product using wood residues bonded together with resin, pressed into sheets.
Industry-wide EPD from the American Wood Council.
Life Cycle Inventory:
See EPD
Product Scope:
Cradle to gate, uncoated
Transportation Distance:
By truck: 468 km
End-of-Life Scope:
14.5% Recovered
22% Incinerated with energy recovery
63.5% Landfilled (wood product waste)
Module D Scope:
Recovered wood products credited as avoided burden.
LCI Source:
RNA: Medium density fiberboard (MDF) CORRIM (2011)
EPD Source:
13CA24184.109.1
EPD Designation Holder:

American Wood Council and Canadian Wood Council EPD Program Operator: UL Environment EPD Expiration: 16/04/2019	2% Organic solvents Product Scope: Cradle to gate, including emissions during application Transportation Distance: By truck: 642 km End-of-Life Scope: 100% to landfill (plastic waste) LCI Source: DE: Application paint emulsion (building, interior, white, wear resistant) ts (2017)
Metal lath, for plaster 33.6 kg Used in the following Revit families: Basic Wall:WA_IW_24_15mm_Plaster 33.6 kg (60 yrs) Used in the following Tally entries: Portland cement stucco Description: Hot dip galvanized steel lath used as reinforcement of interior or exterior plaster (stucco). Life Cycle Inventory: 100% Steel, hot dip galvanized Product Scope: Cradle to gate of panel only, excludes suspended grid system and installation hardware Transportation Distance: By truck: 431 km End-of-Life Scope: 98% Recovered 2% Landfilled (inert material) Module D Scope: Product has 5% scrap input while remainder is processed and credited as avoided burden LCI Source: GLO: Steel Electrogalvanized worldsteel (2014) GLO: Steel sheet stamping and bending (5% loss) ts (2017) US: Electricity grid mix ts (2014) US: Lubricants at refinery ts (2014) GLO: Compressed air 7 bar (medium power consumption) ts (2014) GLO: Value of scrap worldsteel (2014) GLO: Punching steel sheet small part ts (2011)	Porcelain ceramic tile, glazed 2,678.0 kg Used in the following Revit families: Basic Wall:WA_FW_CE.01.03_15mm_Porcelain Stoneware Tiles Navona Tra... 1,420.2 kg (60 yrs*) WA_FW_CE.01.03_15mm_Porcelain Stoneware Tiles Navona Travertine Effect 1,257.8 kg (60 yrs*) Used in the following Tally entries: Ceramic tile Description: Porcelain ceramic tile, glazed Life Cycle Inventory: 100% Ceramic tile, glazed Product Scope: Cradle to gate Transportation Distance: By truck: 1250 km End-of-Life Scope: 55% Recycled into coarse aggregate 45% Landfilled (inert material) Module D Scope: Avoided burden credit for coarse aggregate, includes grinding energy LCI Source: DE: Stoneware tiles, glazed (EN15804 A1-A3) ts (2017)
Mineral wool, high density, NAIMA - EPD 440.9 kg Used in the following Revit families: Basic Wall:WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 87.6 kg (60 yrs*) Basic Wall:WA_IW_13_125mm_Plasterboard Partition_Hmax 4mt_EI60 151.5 kg (60 yrs) Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 49.3 kg (60 yrs*) Basic Wall:WA_IW_25_90mm_Plasterboard Wall Lining_Hmax 5mt_EI60148.2 kg (60 yrs) WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 4.4 kg (60 yrs*) Used in the following Tally entries: Mineral wool, board, generic Steel, C-stud metal framing with insulation Description: Rock board, heavy density. Industry-wide EPD from the North America Insulation Manufacturers Association. EPD representative of conditions in North America. Life Cycle Inventory: See EPD Product Scope: Cradle to gate Transportation Distance: By truck: 172 km End-of-Life Scope: 100% Landfilled (inert waste) LCI Source: US: Rock board insulation (heavy density) NAIMA (2007) EPD Source: 4786060412.102.1 EPD Designation Holder: North American Insulation Manufacturer's Association (NAIMA) EPD Program Operator: UL Environment EPD Expiration: 08/11/2018	Silicate spreadable filler, Brillux - EPD 6.2 kg Used in the following Revit families: Basic Wall:WA_FW_PT.01.01_2mm_Painting 6.1 kg (60 yrs) WA_FW_PT.01.01_2mm_Painting 0.1 kg (60 yrs) Used in the following Tally entries: Paint Description: Silicate filler undercoat by Brillux GmbH & Co. KG. Appropriate for use as a silicate base for mineral surfaces or as an intermediate coating for silicate plasters. Default application rates assume a single coat is used. EPD representative of German (DE) conditions. Life Cycle Inventory: See EPD Product Scope: Cradle to gate Transportation Distance: By truck: 642 km End-of-Life Scope: Includes 100% disposal to landfill as plastic waste LCI Source: DE: Primers and facade paints, "Silicon-Fassadenfarbe"- Brillux (A1-A3) ts-EPD (2011) EPD Source: EPD-BRX-2012411-D EPD Designation Holder: Brillux GmbH & Co. KG EPD Program Operator: Institut Bauen und Umwelt (IBU) EPD Expiration: 17/11/2017
Paint, exterior acrylic latex 35.4 kg Used in the following Revit families: Basic Wall:WA_IW_13_125mm_Plasterboard Partition_Hmax 4mt_EI60 15.4 kg (60 yrs) Basic Wall:WA_IW_16_120mm_Concrete Blockwork_EI60 7.6 kg (60 yrs) Basic Wall:WA_IW_23_120mm_Concrete Blockwork_EI90 1.1 kg (60 yrs) Basic Wall:WA_IW_25_90mm_Plasterboard Wall Lining_Hmax 5mt_EI60 11.3 kg (60 yrs) Used in the following Tally entries: Brick Wall board, gypsum Description: Acrylic-based latex paint for exterior applications. Associated reference table includes primer. Life Cycle Inventory: 20.5% Binding agent 35% Pigments and fillers 40% Water 4.5% Organic solvents Product Scope: Cradle to gate, including emissions during application Transportation Distance: By truck: 642 km End-of-Life Scope: 100% to landfill (plastic waste) LCI Source: DE: Application paint emulsion (building, exterior, white) ts (2017)	Steel, sheet 45.3 kg Used in the following Revit families: WA_EW_07_300mm_Rainscreen Cladding Partition 45.3 kg (60 yrs) Used in the following Tally entries: Insulated metal wall panel, custom Description: Steel sheet Life Cycle Inventory: 100% Steel sheet Product Scope: Cradle to gate Transportation Distance: By truck: 418 km End-of-Life Scope: 98% Recovered 2% Landfilled (inert material) Module D Scope: Product has 16% scrap input while remainder is processed and credited as avoided burden LCI Source: RNA: Steel finished cold rolled coil worldsteel (2007) GLO: Steel sheet stamping and bending (5% loss) ts (2017) US: Electricity grid mix ts (2014) US: Lubricants at refinery ts (2014) GLO: Compressed air 7 bar (medium power consumption) ts (2014) GLO: Value of scrap worldsteel (2014)
Paint, interior acrylic latex 114.1 kg Used in the following Revit families: Basic Wall:WA_CE_02_15mm_Plasterboard 0.3 kg (60 yrs) Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 30.4 kg (60 yrs) Basic Wall:WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 13.4 kg (60 yrs) Basic Wall:WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 58.5 kg (60 yrs) Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 4.7 kg (60 yrs) Basic Wall:WA_IW_24_15mm_Plaster 4.7 kg (60 yrs) WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 0.7 kg (60 yrs) WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 1.5 kg (60 yrs) Used in the following Tally entries: Acoustic ceiling system, mineral fiber board Portland cement stucco Wall board, gypsum Description: Acrylic-based paint for interior applications Life Cycle Inventory: 21% Binding agent 35% Pigments and fillers 42% Water	Stucco, portland cement 693.8 kg Used in the following Revit families: Basic Wall:WA_IW_24_15mm_Plaster 693.8 kg (60 yrs) Used in the following Tally entries: Portland cement stucco Description: Portland cement plastering (stucco), 7/8" (22.25 mm) nominal thickness is typical Life Cycle Inventory: 100% Light plaster (Silica sand, Portland cement, Calcinated lime) Product Scope: Cradle to gate Transportation Distance: By truck: 172 km End-of-Life Scope: 100% Landfilled (inert waste) LCI Source: US: Silica sand (Excavation and processing) ts (2017) US: Portland cement PCA/ts (2015) US: Lime (CaO) calcination ts (2017)
	Suspended grid 87.3 kg Used in the following Revit families: Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 87.3 kg (60 yrs) Used in the following Tally entries: Acoustic ceiling system, mineral fiber board

Description: Cold-rolled galvanized steel for lightweight ceiling grid Life Cycle Inventory: 100% HDG steel Product Scope: Cradle to gate Transportation Distance: By truck: 431 km End-of-Life Scope: 98% recovered 2% landfilled (inert material) Module D Scope: Product has 44% scrap input while remainder is processed and credited as avoided burden LCI Source: RNA: Steel hot dip galvanized worldsteel (2007) US: Metal roll forming (MCA) (2010) US: Electricity grid mix ts (2014) US: Thermal energy from natural gas ts (2014) GLO: Value of scrap worldsteel (2014)	100% Landfilled (inert waste) LCI Source: DE: Gypsum wallboard (EN15804 A1-A3) ts (2017)
Thickset mortar 1,841.2 kg Used in the following Revit families: Basic Wall:WA_IW_16_120mm_Concrete Blockwork_EI60 1,605.7 kg (60 yrs) Basic Wall:WA_IW_23_120mm_Concrete Blockwork_EI90 235.4 kg (60 yrs) Used in the following Tally entries: Brick Description: Grout, for masonry Life Cycle Inventory: 15% Cement 50% Sand 21% Gravel 14% Water Product Scope: Cradle to gate, excludes mortar Anchors, ties, and metal accessories outside of scope (<1% mass) Transportation Distance: By truck: 172 km End-of-Life Scope: 55% Recycled into coarse aggregate 45% Landfilled (inert material) Module D Scope: Avoided burden credit for coarse aggregate, includes grinding energy LCI Source: US: Portland cement PCA/ts (2014) US: Tap water from groundwater ts (2017) EU-28: Gravel 2/32 ts (2017) US: Silica sand (Excavation and processing) ts (2017) Vinyl siding 196.7 kg Used in the following Revit families: Basic Wall:WA_FW_WC.01.03_2mm_Vinyl Wallcovering 196.7 kg (60 yrs) Used in the following Tally entries: Plastic siding, vinyl Description: Rigid vinyl siding, (0.04" thickness) factory formed and cut. Entry exclusive of wood stud, separate weather barrier, or other support material. Life Cycle Inventory: 100% PVC Product Scope: Cradle to gate, excluding any coatings Transportation Distance: By truck: 1299 km End-of-Life Scope: 100% landfilled (plastic waste) LCI Source: US: Polyvinylchloride granulate (E-PVC) ts (2017) GLO: Plastic Extrusion ts (2017) US: Electricity grid mix ts (2014) US: Thermal energy from natural gas ts (2014) US: Lubricants at refinery ts (2014)	Wood stain, water based 5.0 kg Used in the following Revit families: Basic Wall:WA_FW_WD.01.06_70mm_MDF Micro Perforated Sound Absorbing... 5.0 kg (60 yrs) Used in the following Tally entries: Medium density fiberboard (MDF) Description: Semi-transparent stain for interior and exterior wood surfaces Life Cycle Inventory: 60% Water 28% Acrylate resin 7% Acrylate emulsion 5% Dipropylene glycol 1.3% NMVOC emissions Product Scope: Cradle to gate, including emissions during application Transportation Distance: By truck: 642 km End-of-Life Scope: 38.7% solids to landfill (plastic waste) LCI Source: US: Tap water from groundwater ts (2017) US: Acrylate resin (solvent-systems) ts (2017) DE: Acrylate (emulsion) ts (2017) US: Dipropylene glycol by product propylene glycol via PO hydrogenation ts (2017)
Wall board, gypsum, fire-resistant (Type X) 13,112.9 kg Used in the following Revit families: Basic Wall:WA_CE_02_15mm_Plasterboard 50.8 kg (30 yrs) Basic Wall:WA_IW_02_100mm_Plasterboard Wall Lining_Hmax 4mt 1,063.5 kg (60 yrs) Basic Wall:WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 1,401.6 kg (30-60 yrs) Basic Wall:WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 6,134.4 kg (30-60 yrs) Basic Wall:WA_IW_13_125mm_Plasterboard Partition_Hmax 4mt_EI601,723.1 kg (30 yrs) Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 492.6 kg (30-60 yrs) Basic Wall:WA_IW_25_90mm_Plasterboard Wall Lining_Hmax 5mt_EI60 2,023.0 kg (30 yrs) WA_IW_05_125mm_Plasterboard Partition_Hmax 4mt 69.9 kg (30-60 yrs) WA_IW_10_75mm_Plasterboard Wall Lining_Hmax 4mt 154.1 kg (30-60 yrs) Used in the following Tally entries: Wall board, gypsum Description: Fire-resistant gypsum board Life Cycle Inventory: 100% Fire-resistant gypsum wallboard (Gypsum, Boric acid, Cement, Sodium lignin sulfonate, Glass fibres, Silane, Polyglucose, Perlite, Paper, Casein glue) Product Scope: Cradle to gate Transportation Distance: By truck: 172 km End-of-Life Scope: 100% Landfilled (inert waste) LCI Source: DE: Gypsum plaster board (Fire protection) (EN15804 A1-A3)PE (2017)	
Wall board, gypsum, natural 231.0 kg Used in the following Revit families: Basic Wall:WA_IW_18_77mm_Plasterboard Wall Lining_Hmax 10mt 231.0 kg (30 yrs) Used in the following Tally entries: Wall board, gypsum Description: Natural gypsum board Life Cycle Inventory: 100% Gypsum wallboard (Gypsum, Boric acid, Cement, Glass fibres, Ferrochrome-lignine sulfonate, Silane, Polyglucose, Perlite, Paper, Casein glue) Product Scope: Cradle to gate Transportation Distance: By truck: 172 km End-of-Life Scope:	

Acoustic ceiling tile (ACT), mineral fiber board 408.3 kg
Used in the following Revit families:
CE_FC_WD.02.10_100mm_Acoustic Dark Oak Veneered Wood 408.3 kg (60 yrs)
Used in the following Tally entries:
Acoustic ceiling system, mineral fiber board
Description:
Mineral fiber board acoustic ceiling tile, 5/8" thick
Life Cycle Inventory:
100% Mineral fiber board
Product Scope:
Cradle to gate of panel only, excludes suspended grid system and installation hardware
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
100% landfilled (inert waste)
LCI Source:
DE: Mineral fibres ceiling boards (EN15804 A1-A3) ts (2017)

Adhesive, polyurethane 730.1 kg
Used in the following Revit families:
CE_FC_WD.02.10_100mm_Acoustic Dark Oak Veneered Wood 730.1 kg (60 yrs)
Used in the following Tally entries:
Wood veneer
Description:
Generic polyurethane construction adhesive
Life Cycle Inventory:
5% Methylenediphenyl diisocyanate ((p)MDI)
95% Polyurethane (copolymer-component) (estimation from TPU adhesive)
1.35% NMVOC emissions
Product Scope:
Cradle to gate, plus emissions during application
Transportation Distance:
By truck: 840 km
End-of-Life Scope:
98.7% solids to landfill (plastic waste)
LCI Source:
EU-27: Methylenediphenyl diisocyanate ((p)MDI) ts (2014)
DE: Polyurethane (copolymer-component) (estimation from TPU adhesive) ts (2017)

Galvanized steel 682.8 kg
Used in the following Revit families:
CE_CC_01_66.5mm_Plasterboard 82.8 kg (60 yrs)
CE_CC_03_65mm_Radiant 431.7 kg (60 yrs)
CE_CC_06_40mm_Plasterboard 168.3 kg (60 yrs)
Used in the following Tally entries:
Steel, C-H-stud metal framing
Description:
Hot dipped galvanized steel profile, for use with cladding systems.
Life Cycle Inventory:
100% Steel, hot dip galvanized
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 431 km
End-of-Life Scope:
98% Recovered
2% Landfilled (inert material)
Module D Scope:
Product has 44% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RNA: Steel hot dip galvanized worldsteel (2007)
GLO: Steel sheet stamping and bending (5% loss) ts (2014)
US: Electricity grid mix ts (2014)
US: Lubricants at refinery ts (2014)
GLO: Compressed air 7 bar (medium power consumption) ts (2014)
US: Metal roll forming M CA (2010)
GLO: Value of scrap worldsteel (2014)

Hardwood veneer, thin 54.2 kg
Used in the following Revit families:
CE_FC_WD.02.10_100mm_Acoustic Dark Oak Veneered Wood 54.2 kg (60 yrs)
Used in the following Tally entries:
Wood veneer
Description:
Hardwood veneer produced via slicer. Thickness of 0.5mm (1/64") or less. Typically backed by phenolic reinforcement layer.
Life Cycle Inventory:
100% hardwood
Product Scope:
Cradle to gate, uncoated
Transportation Distance:
By truck: 468 km
End-of-Life Scope:
14.5% Recovered
22% Incinerated with energy recovery
63.5% Landfilled (wood product waste)
Module D Scope:
Recovered wood products credited as avoided burden.
LCI Source:
US: Hardwood Veneer AHEC slicer (0,5 mm) AHEC (2013)

Paint, Brillux, Arylic facade paint - EPD 111.2 kg
Used in the following Revit families:
CE_CC_01_66.5mm_Plasterboard 4.0 kg (60 yrs)
CE_CC_03_65mm_Radiant 88.6 kg (60 yrs)
CE_CC_06_40mm_Plasterboard 18.6 kg (60 yrs)
Used in the following Tally entries:
Wall board, gypsum
Description:
Acrylic facade paint by Brillux GmbH & Co. Appropriate for use as coating and bonding agent for mineral and organic substrates as well as on wood and metal surfaces for outdoor use. EPD representative of German (DE) conditions.
Life Cycle Inventory:
See EPD
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 642 km
End-of-Life Scope:
Includes disposal to landfill
LCI Source:
DE: Primers and facade paints, Acryl-Fassadenfarbe - Brillux (A1-A3) ts-EPD (2010)

EPD Source:
EPD-BRX-2012411-D
EPD Designation Holder:
Brillux GmbH & Co. KG
EPD Program Operator:
Institut Bauen und Umwelt (IBU)
EPD Expiration:
17/11/2017

Polyurethane top coat, water-based, for wood 15.1 kg
Used in the following Revit families:
CE_FC_WD.02.10_100mm_Acoustic Dark Oak Veneered Wood 15.1 kg (60 yrs)
Used in the following Tally entries:
Wood veneer
Description:
Water-based polyurethane wood stain, inclusive of catalyst
Life Cycle Inventory:
97.7% Stain (50% water, 35% polyurethane dispersions, 5% dipropylene glycol dimethyl ether, 5% tri-butoxyethyl phosphate, 5% dipropylene glycol methyl ether)
2.3% Catalyt (75% polyfunctional aziridine, 25% 2-propoxyethanol)
24.5% NMVOC emissions during application
Product Scope:
Cradle to gate, including emissions during application
Transportation Distance:
By truck: 642 km
End-of-Life Scope:
26.7% solids to landfill (plastic waste)
LCI Source:
DE: Ethylene glycol butyl ether ts (2017)
US: Epichlorohydrin (by product calcium chloride, hydrochloric acid) ts (2017)
DE: Propylenglycolmonomethylether (Methoxypropanol) PGME ts (2017)
US: Tap water from groundwater ts (2017)
DE: Polyurethane (copolymer-component) (estimation from TPU adhesive) ts (2017)
US: Electricity grid mix ts (2014)

Suspended grid 86.8 kg
Used in the following Revit families:
CE_FC_WD.02.10_100mm_Acoustic Dark Oak Veneered Wood 86.8 kg (60 yrs)
Used in the following Tally entries:
Acoustic ceiling system, mineral fiber board
Description:
Cold-rolled galvanized steel for lightweight ceiling grid
Life Cycle Inventory:
100% HDG steel
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 431 km
End-of-Life Scope:
98% recovered
2% landfilled (inert material)
Module D Scope:
Product has 44% scrap input while remainder is processed and credited as avoided burden
LCI Source:
RNA: Steel hot dip galvanized worldsteel (2007)
US: Metal roll forming (MCA) (2010)
US: Electricity grid mix ts (2014)
US: Thermal energy from natural gas ts (2014)
GLO: Value of scrap worldsteel (2014)

Wall/Ceiling board, gypsum, moisture- and mold-resistant 2,744.4 kg
Used in the following Revit families:
CE_CC_03_65mm_Radiant 2,744.4 kg (60 yrs*)
Used in the following Tally entries:
Wall board, gypsum
Description:
Moisture- and mold-resistant gypsum board
Life Cycle Inventory:
100% Moisture-resistant gypsum wallboard (Gypsum, Boric acid, Cement, Sodium lignin sulfonate, Glass fibres, Silane, Polyglucose, Perlite, Paper, Casein glue)
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
DE:Gypsum plaster board (Moisture resistant) (EN15804 A1-A3) ts (2017)

Wall/Ceiling board, gypsum, natural 925.9 kg
Used in the following Revit families:
CE_CC_01_66.5mm_Plasterboard 164.6 kg (60 yrs)
CE_CC_06_40mm_Plasterboard 761.3 kg (60 yrs)
Used in the following Tally entries:
Wall board, gypsum
Description:
Natural gypsum board
Life Cycle Inventory:
100% Gypsum wallboard (Gypsum, Boric acid, Cement, Glass fibres, Ferrochrome-lignine sulfonate, Silane, Polyglucose, Perlite, Paper, Casein glue)
Product Scope:
Cradle to gate
Transportation Distance:
By truck: 172 km
End-of-Life Scope:
100% Landfilled (inert waste)
LCI Source:
DE: Gypsum wallboard (EN15804 A1-A3) ts (2017)