CARBON CALCULATION REPORT

for

Optima Products Limited

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Executive Summary

Optima (OPL) has previously appointed a third-party consultant to produce Environmental Protection Declarations (EPDs) for a range of their products. For the aluminium material used in the products OPL have already begun to use an aluminium with a lower embodied carbon, in $kgCO_2e$, owing to its 75% recycled content – made up from post-consumer recycled aluminium. Average raw material used in this aluminium are:

- Post-Consumer Scrap: 81%
- Primary Ingot: 11%
- Process Scrap (also denoted pre-consumer scrap): 8%
- Alloying Materials: 0.1%

OPL approached Tunley Engineering to perform forecast calculations to estimate the carbon reductions for a range of products owing to the use of the more environmentally friendly aluminium. Tunley Engineering conducted the calculations to provide OPL with the expected carbon reduction that will result from use of the high recycled content aluminium for their products. These serve as interim forecasts until such time as a full set of updated EPDs are available.

Introduction and Assumptions

The current EPD documents for OPL products containing aluminium provide embodied carbon values for those products. Since the publication of these EPDs, OPL have proactively sought and implemented use of a more environmentally responsible aluminium material that contains a high content of post-consumer recycled aluminium. This reduces the embodied carbon for the aluminium content of each product.

An appropriate emission factor value for the billet of aluminium commonly used in the UK, excluding all further processing, as these factors remain unchanged, is 6.7 $kgCO_2e/kg$. The aluminium billet made using 75% post-consumer recycled aluminium has a lower carbon emission factor at 1.8 $kgCO_2e/kg$.

Tunley Engineering assumed that all emission sources other than aluminium (billet or ingot) remain the same. The change is a direct result of exchanging the aluminium and nothing else within the EPD has otherwise changed.

The data provided in this report provides a forecast estimation for the products, to act as an intermediate guide until such time as full EPD updates can be provided.

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Data

Table 1: Embodied carbon forecasts for OPL products resulting from implementing 75% recycled content Aluminium. All data is reported using declared unit of one m^2, with the exception of AMRs, which is reported per AMRs of 3 m x 3 m and 3 m x 6 m.

Product		EPD Published GWP-GHG ($kgCO_2e$)	Forecast Emissions ($kgCO_2e$)	Reduc-tion ($kgCO_2e$)	Reduction (%)
Partition	Optima 117+ 12.8mm – Cat I	46.6	43.2	3.1	7%
Partition	Optima 117+ 12.8mm – Cat II	50.4	44.5	5.3	12%
Partition	Optima 117+ 12.8mm – Cat III	51.4	43.6	7.0	15%
Partition	Optima 117+ 16.8mm - Cat I	59.7	55.8	3.5	7%
Partition	Optima 117+ 16.8mm - Cat II	64.7	55.9	7.9	14%
Partition	Revolution 54 (Single Glazed) – Cat I	53.3	46.4	6.2	13%
Partition	Revolution 54 (Single Glazed) – Cat II	57.0	46.7	9.2	18%
Partition	Revolution 54 (Double Glazed) – Cat I	94.0	87.1	6.2	7%
Partition	Revolution 54 (Double Glazed) – Cat II	100.0	89.7	9.2	10%
Partition	Revolution 54 (Double Glazed) – Cat III	115.0	97.4	15.8	15%
Partition	Revolution 100 (Single Glazed) – Cat I	70.7	59.4	10.1	16%
Partition	Revolution 100 (Single Glazed) – Cat II	74.9	59.2	14.1	21%
Partition	Revolution 100 (Single Glazed) – Cat III	76.4	58.3	16.3	24%
Partition	Revolution 100 (Double Glazed) – Cat I	98.0	86.7	10.1	12%
Partition	Revolution 100 (Double Glazed) – Cat II	102.0	86.3	14.1	15%
Partition	Revolution 100 (Double Glazed) – Cat III	104.0	85.9	16.3	17%
Door	Edge Symmetry (Single Glazed)	88.6	54.8	30.4	38%
Door	Edge Symmetry (Double Glazed)	98.3	64.5	30.4	34%
Door	Edge Affinity (Single Glazed)	88.6	54.8	30.4	38%
Door	Edge Affinity (Double Glazed)	98.3	64.5	30.4	34%
Door	Elite Symmetry (Double Glazed)	98.3	64.5	30.4	34%
Door	Elite Affinity (Double Glazed)	98.3	64.5	30.4	34%
Other	Fabric Adaptable Wall	57.1	28.7	25.5	50%
Other	Laminate Adaptable Wall	53.9	25.5	25.5	53%
Other	AMR 3 m x 3 m	4,040.0	2,962.0	968.0	27%
Other	AMR 3 m x 6 m	5,840.0	4,272.0	1,408.0	27%

**The different categories for each product refers to differing aluminium content and product specification as detailed in each EPD.*

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In all instances, biogenic removals were neglected due to lack of clarity in the end-of-life routes and information on source of such removals. Therefore, these calculations are based on “GWP-GHG” in the EPDs.

Example calculations for potential reduced emissions from using recycled aluminium.

Product: Revolution 100 – Cat III, 3.3-3.7 kg Al/m^2, 16.8 mm glass, 100x50 mm profiles.

Declared unit: one m^2.

Data from the current EPD for GWP-GHG A1-A3: 76.4 $kgCO_2e$

Mass of Al in the declared unit: 3.7 kg

Emissions of the Al content: 3.7 kg x 6.7 $kgCO_2e$/kg = 24.8 $kgCO_2e$

New emissions (assuming Circa 75R) of Al: 3.7 kg x 1.8 $kgCO_2e$/kg = 6.7 $kgCO_2e$

Reduction = 24.8-6.7 = 18.1 $kgCO_2e$

New emissions = 76.4-18.1 = 58.3 $kgCO_2e$.

Percentage reduction = 18.1/76.2 = 24%.

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