

Climate Recovery Duct System Planning Guide – CO₂



Overview

Calculations are based on Climate Recovery Ducts in comparison to sheet metal ducts insulated with 30mm lamella mat. The total surface area of finished products in square meters (m²) while CO₂ is provided in kilograms (kg).

All data used regarding CO₂ emissions was provided from the Swedish Recycling Industries' Association^A and can be found on the next page. Data regarding product composition provided by commonly accepted values and CR manufacturing processes.

Climate Recovery Duct		Total
Insulation kg/m ²	2,2	0,88 kg CO ₂ /m ²
Recycled glass CO ₂ /kg	0,4	
Aluminium kg/m ²	0,032	0,34 kg CO ₂ /m ²
Recycled aluminium CO ₂ /kg	10,6	
PE kg/m ²	0,035	0,028 kg CO ₂ /m ²
Recycled PE CO ₂ /kg	0,8	
PP kg/m ²	0,017	0,014 kg CO ₂ /m ²
Recycled PP CO ₂ /kg	0,8	
PU (Sleeve) kg/m ²	0,215	0,172 kg CO ₂ /m ²
Recycled PU CO ₂ /kg	0,8	
Total		1,43 kg CO₂/m²

Round sheet metal duct with insulation		Total
Sheet metal duct kg/m ²	4,36	9,16 kg CO ₂ /m ²
Recycled steel CO ₂ /kg	2,1	
Insulation 30mm kg/m ²	0,84	0,34 kg CO ₂ /m ²
Recycled glass CO ₂ /kg	0,4	
Aluminium kg/m ²	0,032	0,34 kg CO ₂ /m ²
Recycled aluminium CO ₂ /kg	10,6	
Total		9,85 kg CO₂/m²

These tables show us that the CR Duct lowers CO₂ emissions by 85% compared to round sheet metal ducts with added insulation.

CO₂ Planning

Notes

- The effects of packaging do not make a large enough impact on the end result to note.
- No data on transport has been included, such as comparing CR Ducts in flat packaging compared to round sheet metal ducts.
- The values used are for utilizing recycled material compared to new raw material production. While we recognize that not all material utilized by all parties is 100% recycled, if strictly raw material values are used, the numbers would be more heavily in favor of CR.

Climate benefits from recycled material compared to new raw material production

Material	CO ₂ /kg	Reduced CO ₂
Glass	0,4	41 %
Aluminium	10,6	96 %
Steel	2,1	87 %
Plastic	0,8	37 %
Paper and cardboard	0,4	37 %
Organic rubbish (compost)	0,02	27 %
Organic rubbish (rotting)	0,07	87 %

Conclusion

We state that at least 80% of CO₂/m² can be saved by using the Climate Recovery Duct System as opposed to sheet metal with added insulation.

Real Life Application

To simplify calculations, CR Ducts save on average $\approx 8 \text{ kg CO}_2/\text{m}^2$.

In Sweden, a normal villa consumes $\approx 1000 \text{ kWh/year}$ through the air-handling unit.

As an assumption based on our knowledge of the market, this villa possesses $20\text{-}30 \text{ m}^2$ of insulated ductwork, so we will use 25 m^2 .

The amount of CO_2/kWh is dependent on domestic energy availability versus imports. We will assume that $1 \text{ kWh} = 20\text{g CO}_2$ output, based on wind, water, nuclear, and bio-based energy provision^B.

Therefore, an average air-handling unit will utilize $20 \text{ kg CO}_2/\text{year}$.
($1000 \text{ kWh} \times 20 \text{ g CO}_2/\text{kWh} = 20 \text{ kg CO}_2$)

Per our calculations, 25 m^2 of installed CR Ducts save about 200 kg CO_2 .
($8\text{kg CO}_2 \times 25 \text{ m}^2 = 200 \text{ kg}$).

Based on this data, installation of the CR Duct System can create a CO_2 -neutral operation over a 10-year period.

A: <http://www.recycling.se/branschfragor/atervinningens-klimatnytta>

B: <http://www.svenskenergi.se/Elfakta/Miljo-och-klimat/Klimatpaverkan/Hur-mycket-koldioxid-medfor-din-elanvandning/>



Notes

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