

Environmental report

„ST 2000-22 (02)“



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1 Product Carbon Footprint „ST 2000-22 (02)“ (Shipping Weight)

1.1 Summary

A life cycle assessment according to DIN EN ISO 14040/44, was performed on a product of HILTI AG (ST 2000-22 (02)), which considers the entire life cycle of the product (cradle to grave). The accounting data come from the source: Sphera LCA for Experts, and are evaluated from CML 2001, August 2016.


Table 1: Global Warming Potential Summary

Raw material acquisition	Transport to production	Production	Transport to consumer	Use*	End of life
Global Warming Potential (GWP 100 Years) [kg CO ₂ – eq.]					
7,39	0,73	0,55	0,42	0,11	-0,65
Total Score CO ₂ -eq.: 8,55 kg					

*Calculation basis for the Use phase: 1 hour of operation

1.2 Technical Data

Table 2: Technical Data

Product name	ST 2000-22	Generation: 02
Serial Number	000125	
FFE Number	2359113	
Service Drawing	5762327	
Shipping Weight	2,383 kg	
WEEE Weight	1,400 kg	
Rated Power Input	1,25 MJ/h	

1.3 Raw material acquisition

The data of the "Raw Material" distribution of the product is derived from a dismantling and disassembling analysis that was already carried out by an external partner.

This dismantling analysis helps to determine the component-particular data of the product. It includes the following steps:

- Materials,
- Material specifications,
- Material masses.

The product was systematically disassembled into sub-assemblies, mixed final parts and pure final parts, and then analysed. The material composition analysis values are combined together in Table 3 as well as in the Illustration 1.

Table 3: Raw material product distribution

Material	Mass [g]	Mass [%]
Steel, Iron	666,3	27,96
Aluminium	113,0	4,74
Copper, Brass	49,6	2,08
Polymers	595,2	24,98
Paper	913,0	38,31
Electric, Electronic	34,9	1,46
Grease, Oil	11,0	0,46
Total	2383,00	100,00

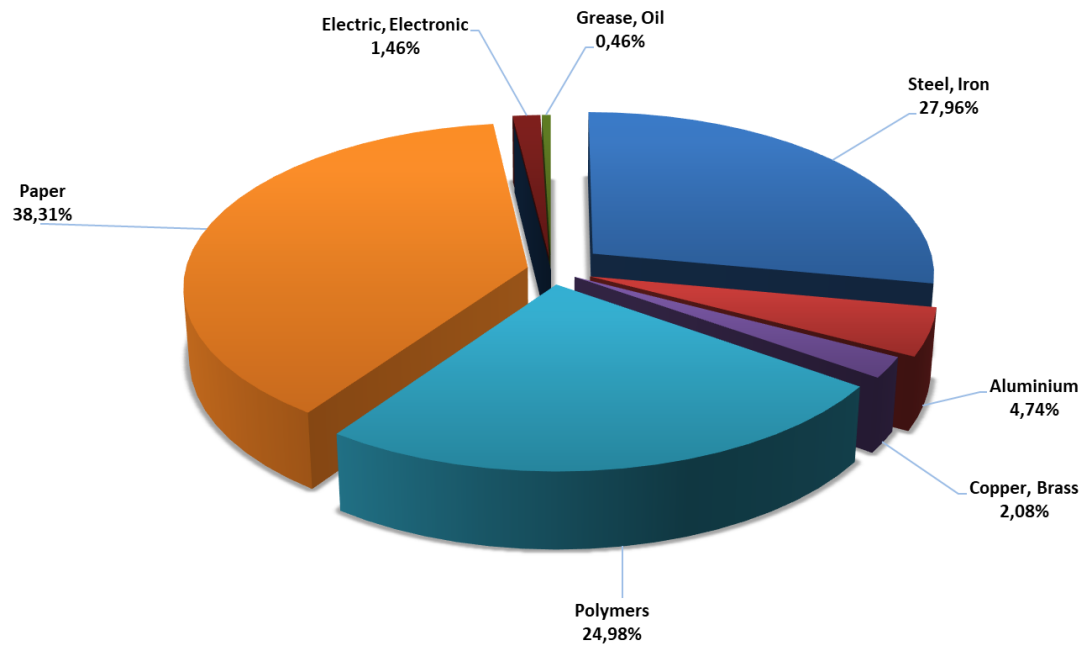


Illustration 1: Raw Material product distribution

GWP 100 Years [kg CO ₂ -eq.]
7,39

1.4 Transport to production

The "Transportation" scenario is based on the Limit Stretch of the EPTA study published by Sphera and is evaluated according to the weight of the product. The transport to production reflects the distances, which are essential for bringing together the individual components (by sea- a container ship for 16800 km for 30% of the product weight, by road- a truck for 4716 km for 70% of the product weight).

Table 4: Transport to production

Transport mode	Distance [km]	Mass [%]
Sea	16800	30
Truck	4716	70
Total	21516	100

For the truck transport, a truck with the pollutant class euro 5 and a volume capacity of 20 t is assumed. For the transport by sea, a container ship with about 43000 dwt is assumed.

GWP 100 Years [kg CO ₂ -eq.]
0,73

1.5 Production

Each material, which is defined in the dismantling and disassembling analysis, is specifically assigned to one or several “Production” processes in order to describe the process as closely as possible. This is shown in the example below and is coordinated with individual HILTI AG product components.

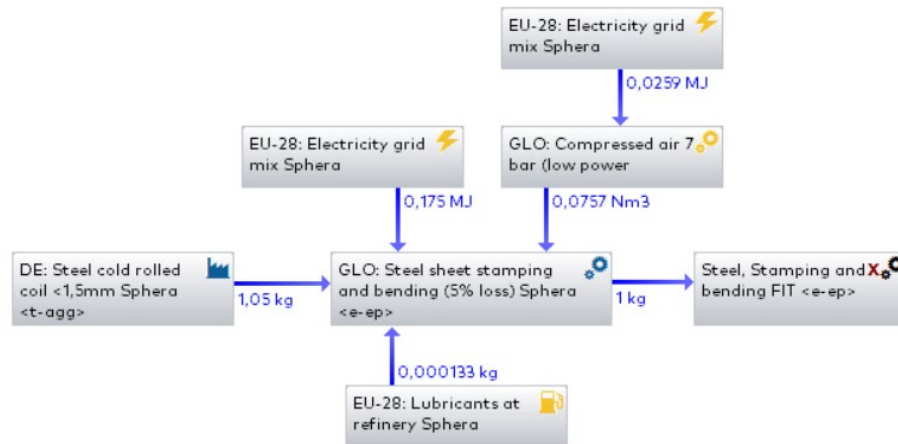


Illustration 2: Example of the process chain

GWP 100 Years [kg CO₂-eq.]
0,55

1.6 Transport to consumer

The transport to consumer reflects the distribution of the product to the various sales companies within the EU (2300 km by road in a truck for 100% of the product weight).

Table 5: Transport to consumer

Transport mode	Distance [km]	Mass [%]
Truck	2300	100

For the truck transport, a truck with the pollutant class euro 5 and a volume capacity of 20 t is assumed.

GWP 100 Years [kg CO ₂ -eq.]
0,42

1.7 Use

In the "Use" phase, it is assumed that the product has an operating time of one hour. During this time the tool has a consumption of 1,25 MJ electrical energy.

GWP 100 Years [kg CO ₂ -eq.]
0,11

The global warming potential for the life of one minute is set for this unit by 0,00183 kg CO₂-eq.

The global warming potential for the life of one hundred hours is set for this unit by 11,0 kg CO₂-eq.

1.8 End of Life

In the “End of life” it is assumed, that the entire product is first fed to a reduction process. A Shredder (QZ 1600 HD) from MeWa, is used for separating and crushing the individual materials. The respective credits come from the material recycling of metals, as well as from the energy recovery of the paper and the polymers.

Table 6: Recycling process data

Output power shredder [kWh]	277
Throughput shredder [kg/h]	4000

GWP 100 Years [kg CO ₂ -eq.]
-0,65



Illustration 3: MeWA QZ 1600 HD

1.9 GWP Total Score

*Calculation basis for the Use phase: 1 hour of operation

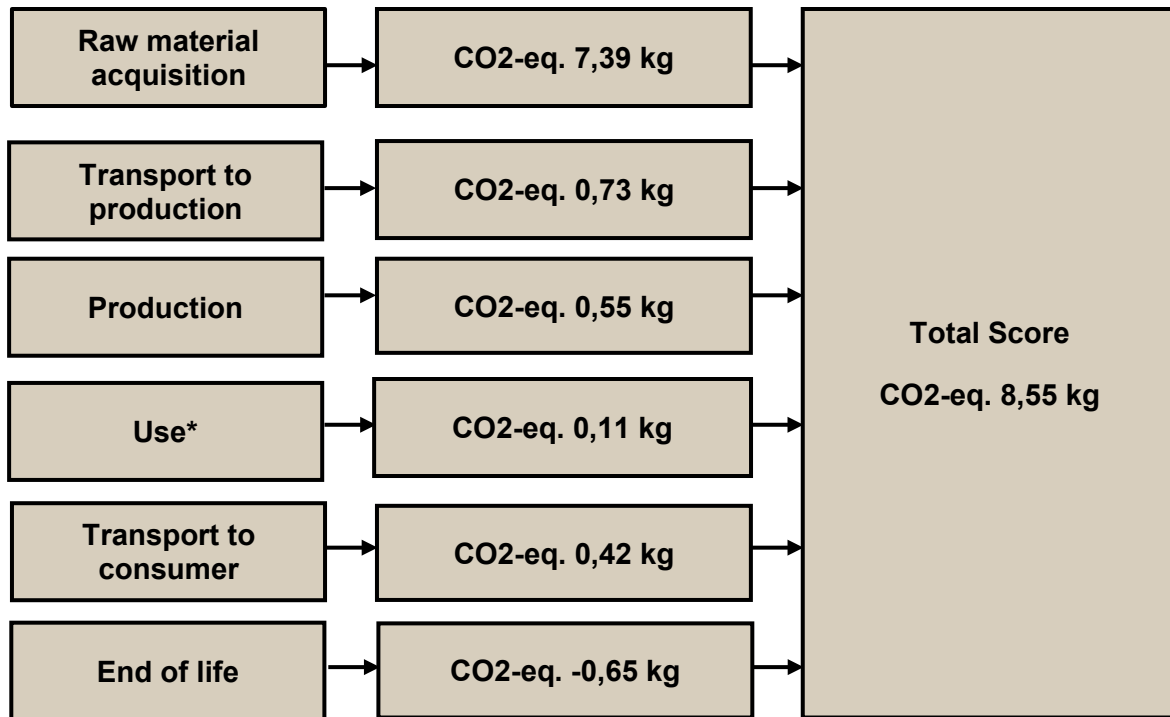


Illustration 4: Global Warming Potential Total Score

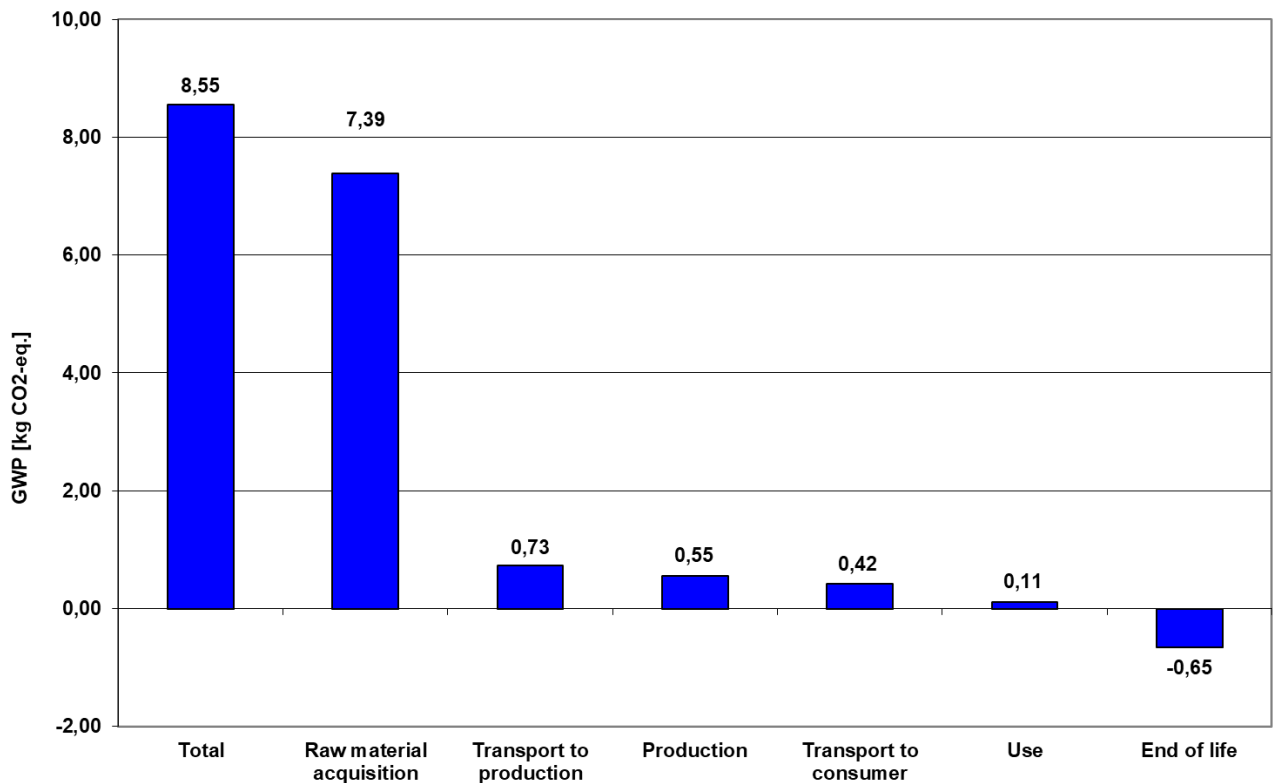


Illustration 5: Global Warming Potential Summary

1.10 Top Ten Evaluation

1.10.1 Raw material acquisition

Table 7: Raw Material Top Ten Evaluation

Raw material	[kg CO ₂ -eq.]
Electronic	1,85
PA6-GF30	1,82
Steel	1,46
Aluminium	1,07
Electric	0,55
PA6-GF35	0,45
PA6	0,28
PA66-GF35	0,14
Epoxy resin	0,11
Copper	0,10

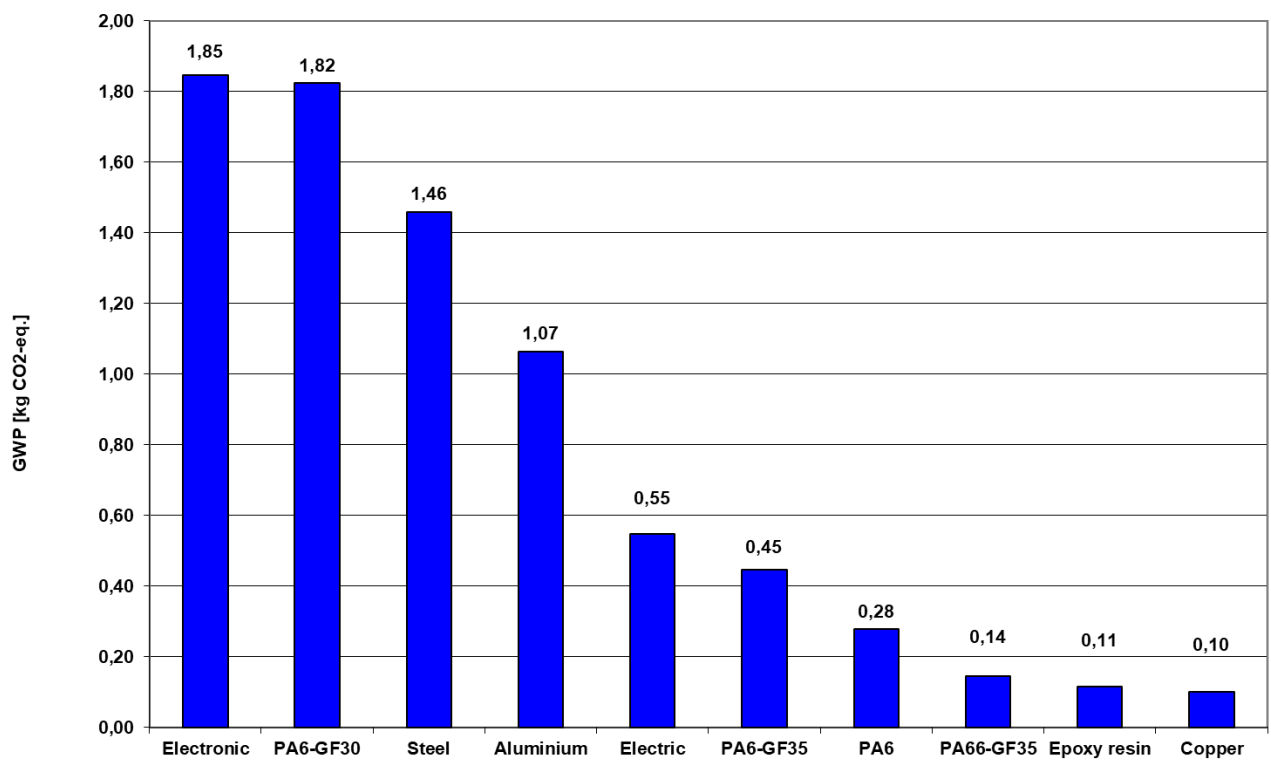


Illustration 6: Raw Material Top Ten Evaluation

1.10.2 Production

Table 8: Production Top Ten Evaluation

Production	[kg CO ₂ -eq.]
PA6-GF30, Injection moulding	0,152
Steel, Cast and milling	0,151
Steel, Forging	0,102
Aluminium, Cast and milling	0,058
PA6-GF35, Injection moulding	0,039
PA6, Injection moulding	0,018
PA66-GF35, Injection moulding	0,011
Copper wire	0,006
Steel, Stamping and bending	0,0053
Elastomer, Injection moulding	0,0050

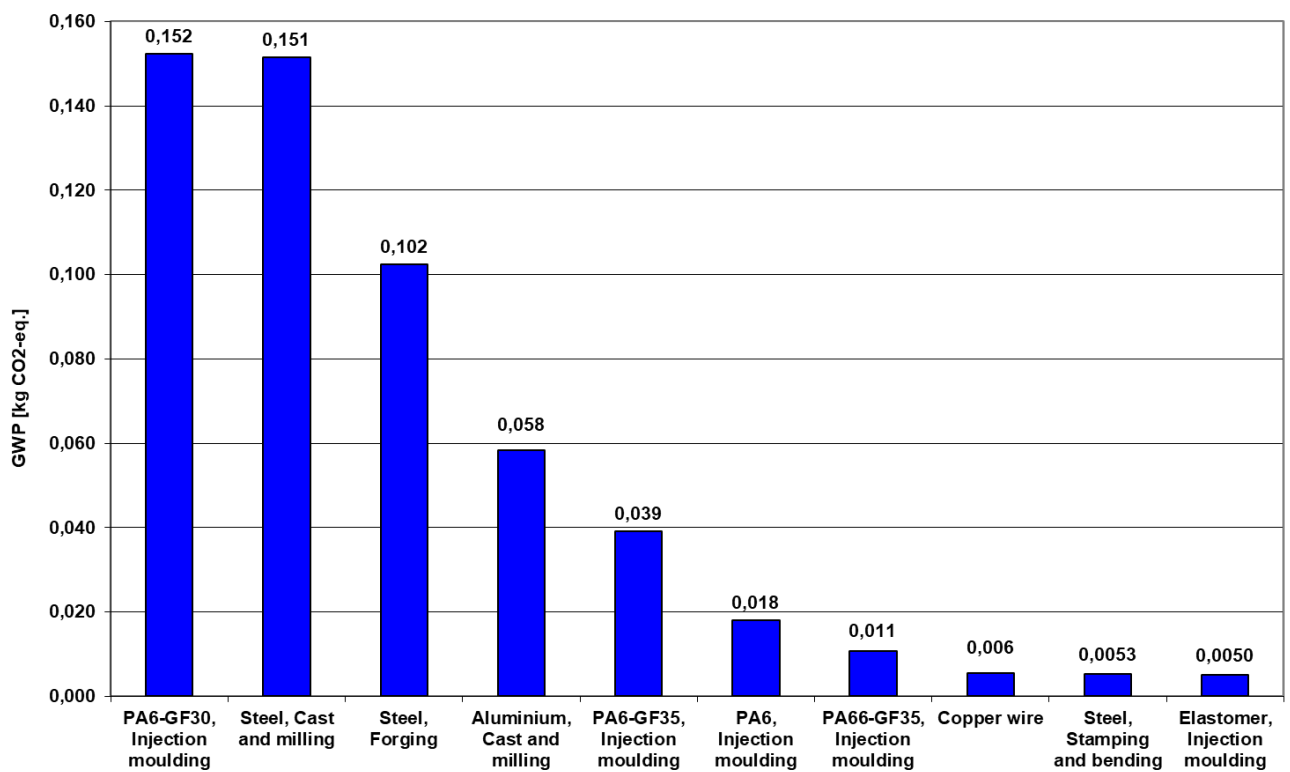


Illustration 7: Production Top Ten Evaluation