Life Cycle Greenhouse Gas Assessment Summary Report

Kodak Alaris Document Scanner Models S3120 Max and S3140 Max
ISO 14044 Protocol

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Summary

Kodak Alaris Holdings Limited (KA) conducted an ISO 14044 Environmental Life Cycle Assessment (LCA) of two KA desktop scanner models, S3120 Max and S3140 Max. This included the full life cycle - raw materials, manufacturing, packaging, distribution, use, and end of life (EOL). In addition to a broad environmental impact assessment using ReCiPe H, there was a more detailed assessment of Greenhouse Gas (GHG) emissions. This LCA was undertaken to meet several objectives:

1. Identify the key drivers of GHG emissions and other environmental impacts from these scanners to provide data that can be used to reduce the life cycle GHG emissions and other environmental impacts of future versions of these and other scanner models.
2. Provide scanner GHG emissions data for use by Kodak Alaris customers.
3. Meet the optional IEEE 1680.2 Imaging equipment EPEAT greenhouse gas emissions requirement in 4.5.2.1.
4. Provide scanner life cycle inventory data to the US National Renewable Energy Laboratory Life Cycle Inventory Database (available via Federal LCA Commons).

This LCA covered 17 environmental indicators developed for the World ReCiPe H/A model, which were normalized and weighted into a single score by the model. The GHG emissions calculations were based on IPCC 2013 GWP 100a Version 1.02 (100-year timeframe). The primary functional unit of this study was one scanner life, with a secondary functional unit of 1000 A4 scanned images. These two units are inter-convertible when combined with a user scenario as discussed in the Functional Units section.

Summary Table 1 contains the average GHG emissions results for the full life cycle using the base case of a 3 year useful life. Key GHG emitting life cycle stages for all models were: the combined Raw Materials and Manufacturing phase, Operating Energy during the Use phase, and Cleaning Supplies during the Use phase. Total emissions/scan were lower for the model with more lifetime scans.

Summary Table 1 - Scanner GHG Emissions (kg CO2eq/scanner life) (IPCC 2013 GWP 100a V1.02)

Scanner Model	Scans/Life	Materials and Manufacturing	Packaging	Transportation of Product	Operation Energy	Cleaning Supplies	Maintenance	End of Life Cutoff Method	Total	kg/1,000 scans
S3120 max	7,290,000	173	16	7	84	42	4	1.1	327	0.045
S3140 max	8,505,000	173	16	7	84	42	4	1.1	327	0.038

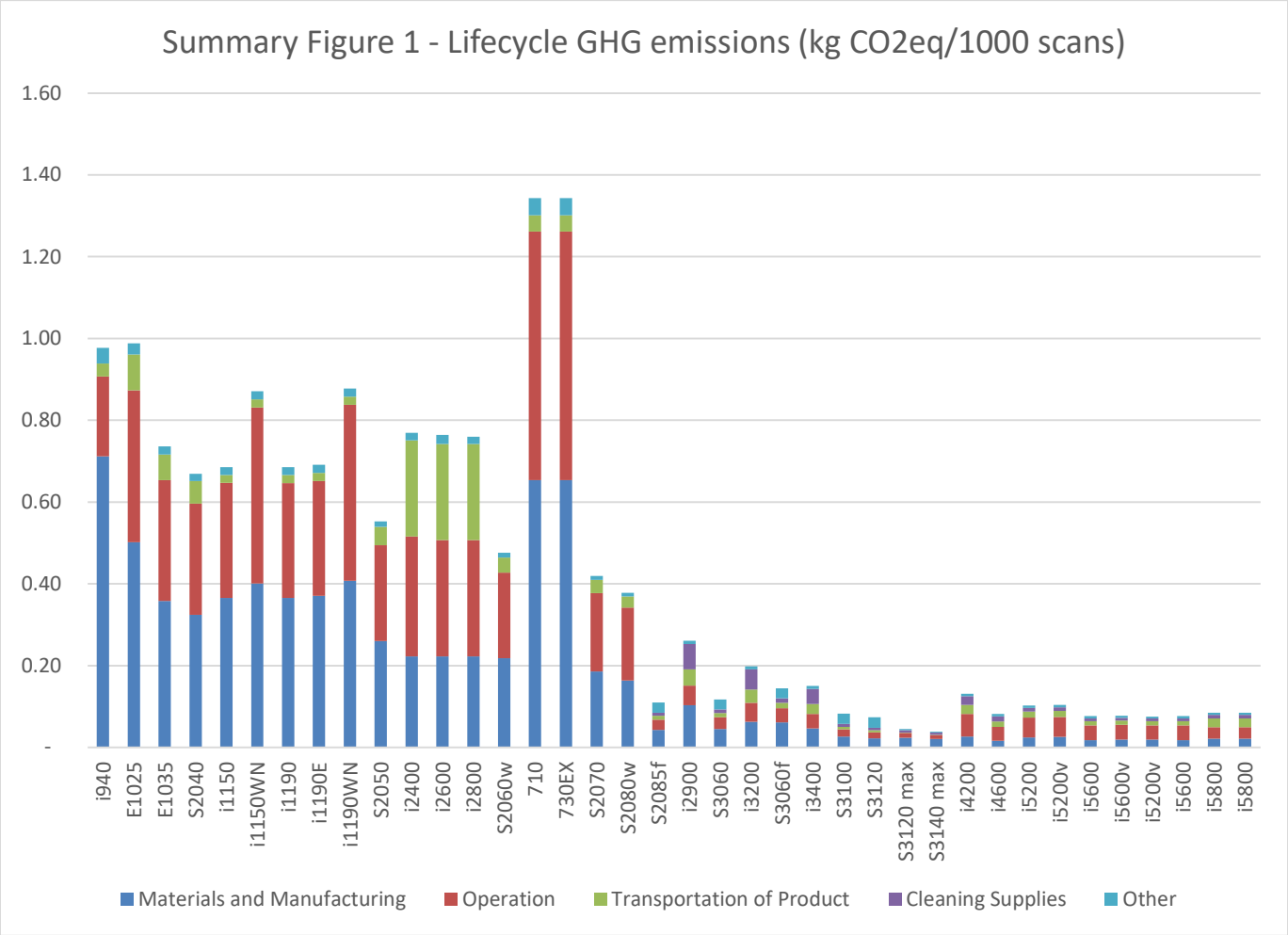
Summary Table 2 breaks down the life cycle ReCiPe H environmental impact points and GHG emissions into the key sources of emissions. Electronic Components was the largest category for overall ReCiPe H impact points, contributing 18% of the life cycle total, followed by Metal Components, Cleaning Supplies, Manufacturing Energy, Scan Mode Operating Energy and Ready Mode Operating Energy, all contributing at least 8% of the total ReCiPe H impact points. Categories impacting GHG emissions are similar, except that Electronic Components only contributed 6% of the life cycle GHG emissions and the three electricity categories contribute a little higher proportion of the total GHG emissions than of the ReCiPe H points.

Summary Table 2 – Key Contributors to S3120 max and S3140 max Life Cycle Environmental Impact – Percentage of Total Life Cycle Impact

Scanner Model	Electronic Components	Metal Components	Cleaning Supplies	Manufacturing Energy	Plastic Components	Scan Mode Operating Energy	Ready mode Operating Energy	Transport of Product, Components and Raw Materials	Packaging	Sleep & Off Energy	Other
ReCiPe H Environmental Impact	18%	14%	14%	12%	12%	9%	8%	6%	4%	2%	2%
GHG Emissions	6%	14%	13%	17%	13%	12%	11%	5%	5%	3%	2%

Summary Figure 1 displays the GHG emissions per 1000 scans for the two models in this study and all the models previously assessed during the previous five life cycle assessments. The models are arranged from the models with the fewest numbers of images scanned per lifetime to those with the most. The general trend is fewer emissions per scan as the number of scans increased. However, the newer S series models are more efficient (lower emissions per scan) than older similar output models (i3000 series) and the S3120 max and S3140 max scanners have the lowest GHG emissions/scan of any KA scanners assessed. This is due to several factors. Ready, Sleep, and Off mode power consumption are all lower in the later models. None of the S3120 max or S3140 max scanners were shipped by air, which significantly reduced transport GHG emissions compared to the earlier scanner models that were shipped by air 30% of the time, and the other more recent models that were shipped by air 10% of the time. Roller Maintenance and user Cleaning Supplies GHG emissions were also lower for the S3120 max and S3140 max models.

The biggest areas for possible future environmental impact improvement are total weight of the scanner, weight of Electronic Components, particularly printed circuit board assemblies, Ready Mode Operating Energy and Cleaning Supplies reduction/reuse. This LCA shows a steady improvement in environmental impact from the 2012 LCA to the current one.


Summary Figure 1 - Lifecycle GHG emissions (kg CO2eq/1000 scans)
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
-
i940
E1025
E1035
S2040
i1150
i1150WN
i1190
i1190E
i1190WN
S2050
i2400
i2600
i2800
S2060w
710
730EX
S2070
S2080w
S2085f
i2900
S3060
i3200
S3060f
i3400
S3100
S3120
S3120 max
S3140 max
i4200
i4600
i5200
i5200v
i5600
i5600v
i5200v
i5600
i5800
i5800
Materials and Manufacturing
Operation
Transportation of Product
Cleaning Supplies
Other