

Carbon Footprint Management Certification for Sustainability Framework

Assessment 2023

Report for:
C. F. Martin & Co., Inc. (Martin Guitar)
in
510 Sycamore St.,
Nazareth, PA 18064
United States

27 July 2023
Audit dates: 24 and 26 July 2023
Audit team: Ondrej Tarabus

Type of certificate: Product Footprint
Certificate code: n/a, see Sustainability
Framework certificate
Certificate issued: n/a, see Sustainability
Framework certificate
Report based on Standard(s): Preferred by
Nature Carbon Footprint Management Standard
(V SF 2.1 - 2023)

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1. Introduction

The purpose of this report is to document conformance with the requirements of the Preferred by Nature Carbon Footprint Management Standard for Sustainability Framework v2.1 by C. F. Martin & Co., Inc., hereafter referred to as the "Organisation".

Preferred by Nature auditors evaluate the Organisation's systems and performance against the applicable requirements and document their findings in this report. The section below presents the conclusions of the audit team and any Non-Conformity Reports (NCR) which the Organisation needs to follow-up on.

The assessment report and its content are kept entirely confidential, except for information that is posted in Preferred by Nature's online database (see Appendix B and C of this report).

Carbon Footprint Management certification is a mechanism for assuring greenhouse gas (GHG) emissions tracking and reporting by a given product, ensuring that all significant emissions are included and that data collection methods and emissions reduction calculations are accurate and ensuring transparency in the organisation's carbon claims.

2. Audit conclusions

2.1 Audit Recommendation

Based on the Organisation's conformance with the Preferred by Nature Carbon Footprint Management requirements, the auditor makes the following recommendation:

☒ Certification approved:
One minor non-compliance issued.

☐ Certification not approved:

Additional comments:

2.2 Non-conformity Reports (NCRs)

Note: NCRs describe evidences of the Organisation's non-conformances identified during audits. NCRs include defined timelines for the Organisation to demonstrate conformance. MAJOR NCRs issued during assessments/ reassessments shall be closed prior to issuance of certificate statement. MAJOR NCRs issued during surveillance audits shall be closed within the identified timeline or it will result in suspension.

☐ No NCR(s)

2.3 Open Non-Conformity Reports (NCRs)

NCR number: 01/23	NC grading:	Major <input type="checkbox"/>	Minor <input checked="" type="checkbox"/>
Standard & Requirement:	Preferred by Nature Carbon Footprint Management Standard for Sustainability Framework V 2.1 requirement 2.1.9		
Description of Non-conformance:			
No buffer was applied by the organization on the total carbon footprint. While from the exclusion point of view, this would not be a problem (as only very minor emission sources are excluded) there is certain margin for error (based on the assessors evaluation the final carbon footprint could be for up to 8% higher than reported depending on the methodology and emission factors used) which is not regulated by the buffer.			
Corrective action request:	Organisation shall implement corrective actions to demonstrate conformance with the requirement(s) referenced above. Note: Effective corrective actions focus on addressing the specific occurrence described in evidence above, as well as the root cause to eliminate and prevent recurrence of the non-conformance.		
NCR conformance deadline:			
Client evidence:			
Evaluation of Evidence:			
NCR Status:	Open		
Comments (optional):			

2.5 Observations

OBS number:	Standard & Requirement:	Preferred by Nature Carbon Footprint Management Standard for Sustainability Framework V 2.1 requirement 3.1.2
Description of findings leading to observation:	Location based emission factor was used. However, the source of the emission factor provided by the organization was representing the whole USA. During the interview with the responsible person, it was revealed that the emission factor used in the calculation was specific for Pennsylvania, however, the source of the emission factor was not provided to the assessor.	
Observation:	It is recommended for the Organisation to ensure that all emission factors are appropriate for the geographic scope of the emissions and that full information exists on the sources of all emission factors.	

A3 Certificate scope

A3.1 Scope details

The scope of the LCA study was "Gradle -to - Gate" and all data related to energy consumption during manufacturing was accurate and provided by Martin Guitar. Additionally, all other data used

for carbon estimations related to raw materials used for the production of the OM Biosphere was estimated based on the type of material used and its weight Exemptions.

A3.2 Carbon footprint calculation and result

Carbon Footprint Calculation			
Carbon Footprint Calculation	Specify method used to calculate carbon footprint Cradle to gate		
	Specify sources of Carbon Global Warming Potential (GWP) factors https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf		
	Specify sources of emission factors (Provide links, if applicable) ✓ the impact of the raw material ✓ distribution transportation of the raw material ✓ distribution transportation of packaging material ✓ waste production during production ✓ energy consumption during manufacturing process		
	Specify emission factors (Provide links, if applicable) • Ecoinvent Database (CSE is an official user of the Database) • U.S. Energy Information Administration (EIA) • https://www.epa.gov/climateleadership/ghg-emission-factors-hub • Publications		
	Specify any major assumptions made in quantifying emissions and in the selection or development of emission factors NA		
	Describe method used to calculate land-use change impacts, where applicable NA		
	Carbon footprint results (product)		
	Year	Total footprint per kg of product	Total footprint per kg of piece
2022	Absolute: N/A	124.45 kgCO2e/one guitar	%

Number of physical sites included in this certificate: 1

This was first assessment, thus changes compared to previous audit are not applicable.

Appendix C: Checklist for CFM certification (confidential)

2. Defining the boundaries of the carbon footprint	
2.1 Defining carbon footprint boundaries	
2.1.4. The Organisation shall define all <i>attributable processes</i> within the product <i>life cycle</i> (either <i>cradle-to-gate</i> or <i>cradle-to-grave</i>) that generate emissions. The Organisation shall illustrate emissions in a process map.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Findings: The organization has defined product life cycle as cradle to gate. The process and emission sourced are illustrated in document called "LCA of OM Biosphere Summary"	
2.1.5. The Organisation shall identify, list, and include in its scope at minimum the required emissions sources across its value chain indicated in Annex I for <i>product footprints</i> .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Findings: The emission sourced are illustrated in document called "LCA of OM Biosphere Summary". All most important emission sources were included in the calculation.	
2.1.6. The Organisation shall report all GHGs applicable in CO ₂ equivalents to the scope of the <i>carbon footprint management system</i> . The Organisation shall, as a minimum, account for the 7 major GHGs: CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃ .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: All relevant GHGs were considered in the calculation. The organization reports and calculates the carbon footprint in CO ₂ e.	
2.1.7. Emissions that are projected to amount to less than 1% of the total <i>anticipated carbon footprint</i> may be left out ¹ .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: The calculations of the raw materials 0.0022Kgr of Fiber-Black and 0.0004 kg of Decal-ink were not included in the study as there were inefficient data for their emissions factors but the emissions from these sources are minor than 1%.	
2.1.8. Emissions considered unfeasible to quantify or associated with unreasonably complicated or costly data collection may be left out in justified cases, provided total emissions excluded do not account for more than 5% of the total <i>anticipated carbon footprint</i> ² .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: See above	
2.1.9. To compensate for any emission sources left out (2.1.7 and 2.1.8), the Organisation shall add an <i>emission buffer</i> to the total <i>carbon footprint</i> proportionate to the exclusions and any perceived margin of error.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>

¹ This is also broadly referred to as "*materiality threshold*", set to ensure that very minor sources of emissions do not require the same treatment as more significant sources.

² Note that the *anticipated carbon footprint* excludes the non-significant sources identified in 2.1.7.

Findings: No buffer was applied by the organization on the total carbon footprint. While from the exclusion point of view, this would not be a problem (as only very minor emission sources are excluded) there is certain margin for error (based on the assessors evaluation the final carbon footprint could be for up to 8% higher than reported depending on the methodology used) which is not regulated by the buffer. NCR 01/23	
2.1.10. Any excluded emissions, including carbon intensive activities that have been outsourced, shall be justified, and documented.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: All outsourced emissions are justified and documented.	
2.2 Choosing a base year	
2.2.1. The Organisation shall choose a <i>base year</i> for which verifiable emissions data are available and shall specify the reasons for their choice. In justified cases of significant yearly fluctuations, the Organisation may use an average over multiple years.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: The year 2022 was established as a base year.	
2.2.2. The <i>base year</i> shall not be set earlier than 36 months from when a decision is taken to engage ³ in this <i>carbon footprint management program</i> . In the event the Organisation already set a <i>base year</i> earlier than 36 months from when a decision is taken to engage in this <i>carbon footprint management program</i> , the existing <i>base year</i> and any prior carbon reductions may be claimed if the Organisation can demonstrate conformance with requirements in this standard.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: See above	
2.2.3. The Organisation shall recalculate the <i>base year carbon footprint</i> when the following cases significantly change ⁴ base year emissions data: a) structural changes involving transfer of ownership or <i>control</i> of existing emission-generating activities or operations (due to mergers, acquisitions, and divestments or outsourcing and insourcing activities); b) changes in <i>calculation methods</i> or improvements in the accuracy of <i>emission factors</i> or <i>activity data</i> ; c) discovery of significant errors, or several errors collectively significant; or d) changes to categories or activities included in the Scope 3 inventory.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings:	

³ This would be considered the date in which the agreement with Preferred by Nature is signed. For example, if the agreement is signed in 2023, 2020 reflects the earliest *base year*.

⁴ The change is considered significant when it results in a minimum of 10% over- or underestimation of the *base year carbon footprint*; however, a lower minimum *threshold* may be instituted by the Organisation.

<p>2.2.4. A recalculation of the base year carbon footprint should not occur where the Organisation experiences organic growth or decline, such as an increase or decrease in production output, changes in product mix, and closures and openings of operating units that are owned or controlled by the Organisation. The organisation should have an internal baseline recalculation policy that corresponds with section 2 requirements.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>Findings:</p>	
<p>2.2.5. The Organisation shall use the base year carbon footprint as a reference for tracking emissions and reductions and, where applicable, <i>carbon offsets</i> and/or <i>insets</i> over time.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>Findings: N/A</p>	
<p>3. Calculation of carbon footprint</p>	
<p>3.1. Identifying emission sources</p>	
<p>3.1.1. The Organisation shall include in the <i>carbon footprint</i> calculations all emission sources required in Annex I unless otherwise justified per 1.4.2.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>Findings: All emission sources were included in the calculation as required by Annex I.</p>	
<p>3.1.2. The Organisation shall include Scope 2 emissions based on both the emissions factors from contractual instruments (market-based method) and the average energy generation emission factors for a defined geographic location (location-based method). The market-based method should then be used in defining the baseline if it meets the quality criteria set out in GHG Protocol - Scope 2 Guidance and if not, the location-based should be used⁵.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/></p>
<p>Findings: Location based emission factor was used. However, the source of the emission factor provided by the organization was representing the whole USA. During the interview with the responsible person, it was revealed that the emission factor used in the calculation was specific for Pennsylvania, however, the source of the emission factor was not provided to the assessor. OBS 01/23</p>	
<p>3.1.3. Any biogenic emissions or <i>removals</i> and <i>land-use change impacts</i> occurring in the <i>product boundary</i> shall be reported separately in the <i>inventory</i> results, when applicable.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>Findings: Even though the product contains biogenic carbon it was not reported in the LCA study. Land use change impact is evaluated within other indicators of SFP.</p>	

⁵ On the occasion that none of the Organisation's energy-consuming facilities exist in areas where *market-based instruments* provide data, the Organisation need only report per the *location-based method*.

3.1.4. The Organisation may include <i>biogenic carbon</i> stored in <i>final products</i> that is not released to the atmosphere based on the carbon stored in the product after the <i>100-year assessment period</i> . Assumptions and calculations of the <i>storage</i> profile shall be documented (see Annex V).	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings: See above	
3.1.5. <i>Avoided emissions</i> shall not be included in the <i>inventory</i> but may be reported separately.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings:	
3.2 Choosing calculation methods	
3.2.1. The Organisation shall justify <i>method(s)</i> for calculating the <i>carbon footprint</i> ⁶ (e.g. sector specific calculation tools, spreadsheets etc.).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings required if NO:	
3.2.2. Companies shall use the most accurate <i>calculation method</i> available to them.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: The organization has outsourced the calculation to external experts who have applied the most accurate calculation model.	
3.2.3. In case updated <i>sector</i> or <i>product specific rules</i> exist, these should be applied ⁷ .	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings:	
3.2.4. <i>Carbon footprint</i> calculations shall be made exclusive of any purchases of <i>carbon offsets</i> .	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings: No carbon offsets were purchased so far.	
3.3 Collect emission data, choosing emission factors, and calculating results	
3.3.1. The <i>carbon footprint</i> shall be based on <i>primary data</i> for all processes owned or operated by the Organisation. For other processes, including those involving <i>indirect emissions</i> , the Organisation shall use <i>primary data</i> if available and otherwise use <i>secondary data</i> from a relevant and authoritative source.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>Findings: The organization used primary data for all processes owned and operated by them. For the majority of the calculations CSE used mainly the Ecoinvent database. For the estimation of energy consumption and related CO2 emissions it was assumed that equal energy per Guitar was consumed for the total production of 44,790 Guitars in Nazareth facilities in 2022.</p> <p>In the case of raw materials two materials were not included in the final report as there were no efficient data to proceed with the calculations. Those materials were: 0.0022Kgr of Fiber-Black and 0.0004 kg of Decal-ink.</p> <p>As their weight and volume on the final product is very low, we assume that their contribution on the total LCA of the final product would be low. Also, the main material consisting of those two raw materials for the guitar are fiber and paper which have very low environmental impact.</p>	

⁶ The Organisation must also document any methods for calculating *land-use impacts* as well as *biogenic emissions* and *removals*, when applicable. This point pertains to both corporate and product inventories.

⁷ e.g. ISO 16759 Quantifying and communicating the *carbon footprint* of print media products; Product Environmental Footprint Category Rules and Organisation Environmental Footprint Sector Rules.

<p>For the wood as raw material, average emissions factors (from Ecoinvent Database) were used for the calculations of Ebony, European Spruce, Mahogany, Sipo and Sitka Spruce. (In this case carbon variations may occur)</p> <p>For the strings manufacturing for the brass ferrules (ball-ends) a mixture of 80% copper and 20% Zinc has been assumed and for the copper-nickel alloy wrap wire a mixture of 60% copper and 40% zinc has been assumed for final calculations.</p>	
<p>3.3.2. The Organisation shall identify and justify the method for collecting emission data across the product life cycle as well as the sources of data, emissions factors, and any techniques used to collect data via sampling or estimation.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p>Findings: The organization has presented document "LCA report for the guitar – OM Biosphere Model" where method for collecting emission data across the product life cycle as well as the sources of data, emissions factors, and any techniques used to collect data are covered.</p>	
<p>3.3.3. GHG emissions shall be calculated using <i>emission factors</i> from reliable and updated sources (e.g. government agencies or industry associations) where quantifications are based on calculations (e.g. <i>activity data</i> is multiplied by an emission factor) instead of direct measurement of emissions.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>Findings: Emission factors provided by Ecoinvent, and other databases were used. Namely these sources were used:</p> <ul style="list-style-type: none"> • Ecoinvent Database (CSE is an official user of the Database) • U.S. Energy Information Administration (EIA) • https://www.epa.gov/climateleadership/ghg-emission-factors-hub • Publications <p>How Green Are Trees? — Using Life Cycle Assessment Methods to Assess Net Environmental Benefits - Aaron C. Petri; Andrew K. Koeser</p> <p>High-Carbon Steels - Metalworking Fluids (MWFs) for Cutting and Grinding, 2012</p> <p>Life Cycle Assessment of Wire + Arc Additive Manufacturing compared to green sand casting and CNC milling in stainless steel Bekker, Anne; Verlinden, Jouke, 2018</p> <p>Emission of CO₂ and CH₄ From 13 Deadwood Tree Species Is Linked to Tree Species Identity and Management Intensity in Forest and Grassland Habitats – 2022</p>	
<p>3.3.4. The Organisation shall use <i>emission factors</i> that are relevant to the process or activity concerned and current at the time of quantification (e.g. kgCO₂e per kWh for the year under calculation), whenever possible.</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/></p>
<p>Findings:</p>	
<p>3.3.5. The Organisation shall convert emissions data⁸ into CO₂ equivalent though Global Warming Potential (GWP) factors⁹.</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/></p>
<p>Findings: All emission were presented in CO₂e.</p>	

⁸ Emissions data may stem from *direct emissions* data or by multiplying *activity data* by an emissions factor.

⁹ GWP values may be obtained from the Intergovernmental Panel on Climate Change (IPCC) or IPCC GWP values approved by the United Nations Framework Convention on Climate Change (UNFCCC).

3.3.6. The Organisation shall avoid double counting of emissions reductions between two or more entities ¹⁰	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: No reductions were reported	
3.3.7. The Organisation shall ensure that the use of any <i>energy attribute certificates</i> demonstrate real emissions reductions (as based on green or <i>renewable energy</i>) and that such reductions have not been achieved through <i>carbon offsets</i> .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: No reductions were reported	
3.3.8. The <i>carbon footprint</i> shall be expressed in relation to the specified <i>unit of analysis</i> in <i>kgCO₂e</i> or in <i>tCO₂e</i> (e.g. <i>kgCO₂e</i> per single production unit or per m ³ of product) and in <i>absolute terms</i> as an amount of <i>tCO₂e</i> .	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Findings: The unit of analyses is one guitar OM Biosphere Model	
3.4 Allocations	
3.4.1. The Organisation shall avoid or minimise <i>allocations</i> where possible. This can be done by gathering additional product-specific data from value chain partners, developing models to estimate emissions related to products produced, subdividing a common process to distinguish product inputs and outputs, or expanding the system boundaries.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: The organization has avoided allocations and used these only in cases where no data were provided. E.g. For the strings manufacturing for the brass ferrules (ball-ends) a mixture of 80% copper and 20% Zinc has been assumed and for the copper-nickel alloy wrap wire a mixture of 60% copper and 40% zinc has been assumed for final calculations.	
3.4.2. If <i>allocations</i> cannot be avoided, they shall be based on a physical relationship (e.g. mass, volume, number of outputs) or on an economic relationship as a second alternative.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: See above	
3.4.3. The Organisation shall identify and justify <i>allocation</i> methods.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Findings: The organization has presented document "LCA report for the guitar – OM Biosphere Model" where allocation methods are described and justified.	
3.4.4. For <i>allocations</i> of recycled input or recyclable output the Organisation shall use the <i>recycled content</i> or <i>closed loop approximation method</i> ¹¹ , or a method based on relationships expressed in 3.4.2 or <i>sector/product specific rules</i> .	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Findings: N/A	

¹⁰ Double counting of emissions reductions occurs when more than one Organisation counts a GHG reduction within the same emission scope or the same Scope 3 emission source (see Annex I).

¹¹ For information on the *recycled content* and *closed loop approximation methods* refer to GHG Protocol - Product Life Cycle Accounting and reporting Standard or PAS 2050 - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.