FEASIBILITY STUDY CRADLE TO CRADLE

ON WOODEN WINDOW FRAMES FOR THE BRITISH WOODWORKING FEDERATION



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SUMMARY FEASIBILITY STUDY

OVERVIEW FEASIBILITY STUDY

The main purpose of this study is to determine whether a typical wooden window frame is suitable to be certified in conformance to the Cradle to Cradle Product Standard v3.1 requirements. The study also provides an indication on the most critical requirements and assumptions. The study is executed by Cradle to Cradle Assessment body SGS Search and commissioned by the British Woodworking Association. A Bill of Material, reflecting a general wooden window frame including dyes, pins and other materials, has been provided by the British Woodworking Association and served as the basis for this study.

CRADLE TO CRADLE CERTIFIED[™]

The Cradle to Cradle Certified[™] Product Program, administered by the Cradle to Cradle Products Innovation Institute, provides a framework in which products are assessed across five categories (Material Health, Reutilization, Energy, Water and Energy). The result reflects the level of compatibility of the product to the Circular Economy. Product certification is awarded at five levels, ranging from basic to platinum.



OVERALL RESULT

A wooden window frame, produced with materials as indicated in par. 2.1.1., can be eligible for certification on a **Silver** level. It is important to note that none of the materials should contain any Banned chemicals according to the Cradle to Cradle Product Standard version 3.1. However, we do not foresee any issues for wooden window frames.

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VATER STEWARDSHIP	×.		1		
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The overall certification level reflects the lowest score among the assessed categories. In this feasibility study, a wooden window frame is estimated to be certified at a Silver level at Material Health and Water Stewardship. For the categories Material Reutilization, Renewable Energy and Social Fairness a Gold level should be feasible.

SUMMARY OF RESULTS AND RECOMMENDATIONS

MATERIAL HEALTH

SGS Search and Arche Consulting have analysed wood and preservatives (\geq 95% of the materials used, threshold for Silver level certification). The result implies that when using the materials as indicated in par. 2.1.1., a Cradle to Cradle Silver level is feasible. The results show that no chemicals conflict with Cradle to Cradle Silver level requirements. Please find more information in Appendix I and II. However, the analysed 95% of materials are for a general fictional product and could ultimately vary per applicant. If wood and preservatives do not add up to \geq 95% of the materials used, then other materials will have to be assessed as well.

For a Gold level 100% of the materials need to be analysed. Therefore, analysis of coatings, adhesives, sealant and steel pins will be required and no X-assessed chemicals may be present. In the case of wooden window frames this could be challenging with current materials used. If an applicant aims for a higher level of certification then an option could be to replace materials. For





example, replace the wood used with a Cradle to Cradle certified wood such as Accoya¹. More information on Cradle to Cradle Certified Materials, including products related to a wooden window frame such as glass and sealants can be found on www.c2ccertified.org.

MATERIAL REUTILIZATION

For Material Reutilization we expect no issues to achieve a Gold level as the product contains rapidly renewable material and is for 98% recyclable. A platinum level will be difficult to achieve as the product would have to be produced of 100% recycled or rapidly renewable content and would have to be 100% recyclable. Please note that obtaining a Gold level in this category is only possible when the wood is FSC or PEFC certified.

RENEWABLE ENERGY AND CARBON MANAGEMENT

The silver level certification requires that at least 5% of the purchased energy related to the production of the wood is renewably sourced (Gold requires 50%). SGS Search does not foresee any issues on reaching this level. Green electricity or REC's should be easily attainable for applicants. If possible, generating renewable electricity on location should be preferred.

WATER STEWARDSHIP AND SOCIAL FAIRNESS

Both categories should not lead to disproportional measures in order to obtain a Silver or even Gold level. If the final production of the wooden window frame does not require any water usage which is in direct contact with the product even Platinum could be obtained. For Social Fairness, reaching a Gold certification level is feasible but requires more commitment by the applicant.

¹ For more on Accoya, see <u>http://www.c2ccertified.org/products/scorecard/accoya_wood_radiata_pine_alder</u>





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1 OVERVIEW OF RESPONSIBLE PARTIES

1.1 LEAD ASSESSMENT BODY

The Lead Assessment Body is accredited by the Cradle to Cradle Product Innovation Institute to guide and assess companies towards a Cradle to Cradle Certificate.

Company:	SGS Search Consultancy
Project Manager:	Gert-Jan Vroege, Senior Consultant, gert- jan.vroege@sgs.com, +31 653 262 599
Final Assessment Sign-off:	Jeroen Kanselaar, Senior Consultant, jeroen.kanselaar@sgs.com
Other Individuals Involved In Assessment:	Martijn Weening, Consultant Eduard van Ravensberg, Junior Consultant,

1.2 MATERIALS ASSESSMENT BODY

The Materials Assessment Body is accredited by the Cradle to Cradle Product Innovation Institute to assess the material health of products by conducting an ABC-X analysis.

Company:	Arche Consulting	
Materials Assessment Lead:	Lieve Claeys, Senior Project Scientist, lieve.claeys@arche- consulting.be	
Other Individuals Involved In Assessment:	Vincent Dunon, vincent.dunon@arche-consulting.be	

1.3 APPLICANT

Company Name:	British Woodworking Federation
Address:	26 Store St, Bloomsbury, London WC1E 7BT, The United Kingdom
Primary Contacts:	Iain McIlwee, Chief Executive, iain.mcilwee@bwf.org.uk, 07792 959481 Kevin Underwood, Technical Director, Kevin.underwood@bwf.org.uk, 0844 209 2610





1.4 CERTIFICATION SCORECARD

The Certification Scorecard represents the levels that SGS Search finds feasable to achieve for wooden window frames for each of the five Cradle to Cradle categories. It is important to note that the results of this research are based on a fictional product and that actual assessment results may vary.

Category	Feasibility
Material Health	Silver
Material Reutilization	Gold
Renewable Energy and Carbon Management	Gold
Water Stewardship	Gold
Social Fairness	Gold
Overall Certification Level	Silver





2 PRODUCT INFORMATION

2.1 PRODUCTS COVERED IN THIS REPORT

2.1.1 PRODUCT OR PRODUCT GROUP NAME

The following product was subject to review: Wooden window frames

The British Woodworking Federation has provided the following overview of a typical composition of a wooden window frame. This composition reflects a typical wooden window frame. Changes in composition will lead to a change in the result of this feasibility study.

Generic Material	Part Name/Function
Redwood timber	Structure
Preservatives	Protim 265 consisting of:
	Propiconazole
	Permethrin
End sealant	Sealant
PVA adhesive	Adhesive
Coating	Decorate and seal for protection
Polypropylene	Bottom bead packer (sealer/structural)
Stainless steel	Panel pins (joining)

A typical wooden window frame consists of a wooden structure, treated and coated, held together with steel pins and adhesives. The structure also contains some polypropylene and is sealed with sealant. These are the materials that are subject to this Cradle to Cradle feasibility report. If applicants use alternative materials then the results of the Cradle to Cradle assessment can differ.

2.1.2 CONFORMANCE WITH PRODUCT GROUPING REQUIREMENTS

This report does not cover a single product but a fictional generalized product group. As such, information in this report covers all wooden window frames that are in conformance with product grouping requirements. The main requirement is that the wooden window frames fall into the same Cradle to Cradle product category, namely *Building Supplies & Materials: Building Exteriors*. Other requirements are that products need to have the same manufacturing process, the same function and the same exposure scenario's (more on exposure in Ch. 3 Material Health).

2.2 PACKAGING

Packaging is not included in this report as it is not a mandatory part of Cradle to Cradle certification. If applicants want to include packaging, signed banned list declarations for all materials, including inks, labels, adhesives and any other material used to label the product, need to be provided (for banned list documents see 3.2). To certify packaging a separate assessment is done on the Material Health and Material Reutilization of all packaging materials to check their toxicity and reusability.





2.3 MANUFACTURING SITE

A site visit of the manufacturing site(s) is a mandatory part of the Cradle to Cradle assessment (from Bronze). During the site visit, the production processes and factory are inspected. A site visit is only conducted on the final manufacturing site. If an applicant has multiple final manufacturing sites then all sites have to be visited. No site visit has been conducted for this feasibility study.





3 MATERIAL HEALTH

3.1 OVERVIEW

The category Material Health focuses on reducing the negative impact of the materials used on people or the environment. Depending on the aspired certification level more requirements have to be fulfilled. These requirements are listed below.

Level	Requirement	Feasibility
	The product is 100% characterized by its generic materials (e.g., aluminum, polyethylene, steel, etc.) and/or product categories and names (e.g., coatings).	No issue found
Basic	The appropriate metabolism (i.e., technical nutrient (TN) or biological nutrient (BN) is identified for the product and its materials and/or chemicals.	No issue found
	The product does not contain any Banned List chemicals based on supplier declarations.	No mayor issue expected
Bronze	The product is at least 75% assessed (by weight) using ABC-X or ABC-X ratings. Externally Managed Components (EMCs) are considered assessed and contribute to the overall percentage of the product that has been assessed. Products that are entirely BN in nature (e.g., cosmetics, personal care, soaps, detergents, etc.) are 100% assessed.	No issue found
	A phase-out or optimization strategy has been developed for those materials with an X/x or GREY/grey rating (if applicable).	No issue found
Silver	The product has been at least 95% assessed (by weight) using ABC-X ratings. Externally Managed Components (EMCs) are considered assessed and contribute to the overall percentage of the product that has been assessed. Products that are entirely BN in nature (e.g., cosmetics, personal care, soaps, detergents, etc.) are 100% assessed.	No issue found
	The product contains no substances known or suspected to cause cancer, birth defects, genetic damage, or reproductive harm (CMRs) after the A, B, C, X assessment has been carried out.	No issue found
	The product has been 100% assessed (by weight) using ABC ratings. All EMCs are considered assessed as non-X.	Not feasible due to X assessed chemicals
Gold	The product contains no x-assessed or grey chemicals (optimization strategy is not required)	Not feasible due to X assessed chemicals
	Product meets Cradle to Cradle emissions standards.	Not examined
Platinum	All process chemicals have been assessed and none have been assessed as x or grey.	Not examined

3.1.1 MATERIAL HEALTH CERTIFICATE

For those applicants that do not require a Cradle to Cradle certificate it is possible to obtain a Material Health Certificate. The Material Health certificate only requires the applicant to comply with the criteria





in the Material Health category. A silver level Material Health certificate would therefore be feasible for a wooden window frame. More information about Material Health Certificates on www.c2ccertified.org.

3.1.2 PRODUCT METABOLISM

Wooden window frames are made from a mix of biological and technical nutrient materials. Biological Nutrient materials are defined as materials that are capable of feeding organic systems.

If a material cannot be processed by biological systems it should be designed in such a way that it can be reused as a resource in systems of human artifice (Technical Nutrients). Ideally, both BN's and TN's should not affect the Biological or Technical cycle in any negative way.

Below we have listed the materials of wooden window frames and their nutrient group.

Generic Material	Part Name/Function	Nutrient Type (biological - BN or technical - TN)
Redwood timber	Structure	BN
Preservatives	Preservative	BN
End sealant	Sealant	BN
PVA adhesive	Adhesive	BN
Coating	Decorate and seal for protection	BN
Polypropylene	Bottom bead packer (sealer/structural)	TN
Stainless steel	Panel pins (joining)	TN

3.2 BANNED LIST COMPLIANCE

The applicant must provide written confirmation that all materials used in a Cradle to Cradle certified[™] product comply with the Banned List v3.0 requirements. The Banned List declaration contains a list of chemicals (such as PVC, see appendix for the full list of Banned chemicals) that cannot be present above a certain threshold in a certified product.

For this report, no Banned List declarations are included since this report deals with a fictional product. Another reason is that suppliers vary for each applicant. From experience, SGS Search does not expect issues with obtaining the Banned List declarations considering the materials used in the wooden window frame. However, considering the materials used for wooden window frames we expect no issues to gather the Banned List documents.

Also, depending on the desired level of certification, a certain percentage of the product will need to be externally assessed, (75% of the weight for Bronze, 95% for Silver and 100% for Gold). For this certification, 98.93% of the product (wood and preservatives) has been assessed. The overall material has received a rating of X due to identified risks inherent in one or more ingredients. Though in none of the substances a CMR hazard has been identified and is therefore acceptable for the use in a Cradle to Cradle Certified^{CM} product up to the silver level. As an exposure assessment, for Cradle to Cradle © Material Assessment, doesn't consider hazards related to the organohalogen endpoint, no exposure assessment was taken into account to derive the individual or overall risk ratings. The reasoning for this is that organohalogens tend to be persistent, bioaccumulative, and toxic or can form toxic by-products if incinerated and therefore the individual hazard assessment will determine the risk rating. When applying for a Silver level certification, an optimization strategy should be foreseen for the compounds permethrin and propiconazole. More information can be found in Appendix II.





4 MATERIAL REUTILIZATION

4.1 OVERVIEW

The category Material Reutilization aims to measure whether the products contribute to eliminate the concept of waste. The ultimate goal is that the materials can be perpetually recycled while keeping their value. A specific score is calculated based on how and to what extent materials can be reused. For higher levels of certification it is expected that a strategy is implemented to ensure materials are actually reused (self or by third-party).

Level	Requirement	Feasibility
Basic	Each generic material in the product is clearly defined as an intended part of a biological or technical cycle (this is covered by the Material Health requirement at Basic level; see Material Health guidance in Section 3.2).	No issue found
Bronze	The product has a Material Reutilization Score that is \geq 35.	MRS is ≥ 95
Silver	The product has a Material Reutilization Score that is \geq 50.	MRS is ≥ 95
	The product has a Material Reutilization Score that is \geq 65.	MRS is ≥ 95
Gold	The manufacturer has completed a "nutrient management" strategy for the product including scope, timeline, and budget.	Feasible
	The product has a Material Reutilization Score of 100.	Not feasible
Platinum	The product is actively being recovered and cycled in a technical or biological metabolism.	Not easily feasible

4.2 MATERIAL REUTILIZATION SCORE (BRONZE, SILVER, GOLD & PLATINUM)

4.2.1 RAPIDLY RENEWABLE, RECYCLED, BIODEGRADABLE, AND RECYCLABLE CONTENT

In order to calculate the Material Reutilization score (MRS) it is necessary to identify the materials and check their content. The MRS takes into account if materials are made with recycled content or rapidly renewable content and whether materials can be counted as recyclable or biodegradable.

An overview for the materials of the wooden window frame is listed below.

Generic Material	Part Name/Function	Is the material recyclable, rapidly renewable or biodegradable?
Redwood timber	Structure	Rapidly renewable & biodegradable
Preservatives	Preservative	NA
End sealant	Sealant	NA
PVA adhesive	Adhesive	NA
Coating	Decorate and seal for protection	NA
Polypropylene	Bottom bead packer (sealer/structural)	Recyclable
Stainless steel	Panel pins (joining)	Recyclable





4.2.2 MATERIAL REUTILIZATION SCORE:

The Material Reutilization score is determined as follows: [(% recycled or rapidly renewable content) + 2 (% recyclable or biodegradable content)] / 3

Percent recycled content:	0.00%
Percent rapidly renewable content:	98.93%
Percent recyclable:	0.57%
Percent biodegradable:	98.93%
Material Reutilization Score:	99.31

With a Material Reutilization score of 99.31, wooden window frames should not have a problem to achieve Gold level on Material Reutilization. The high score is achieved because of the high percentage of FSC certified wood in the product. The polypropylene and the Stainless Steel are highly recyclable so also contribute to a higher score. However, non-organic glues and adhesives are in most cases not recyclable.

4.3 NUTRIENT MANAGEMENT STRATEGY AND NUTRIENT CYCLING (GOLD, PLATINUM)

Gold and Platinum levels require applicants to formulate a Nutrient Management Strategy (NMS). The NMS details how the product can be recycled and how the applicant will stimulate recycling. The strategy must contain an implementation timeline, methods of recovering, reusing, recycling or composting and a method on how the customer and public is informed about the strategy. It is important to note that recycling can be done by the applicant or through sub-contracting with third-parties.

We recommend setting up one Nutrient Management Strategy that will serve as a blue print for all Wooden Window Manufacturers to apply for a Cradle to Cradle Certified[™] certification. This will lower certification and implementation costs for each individual applicant.





5 RENEWABLE ENERGY AND CARBON MANAGEMENT

5.1 OVERVIEW

The aim of theRenewable Energy and Carbon Management category is to eliminate all emissions related to electricity usage as well as direct on-site emissions associated with the assessed product and to stimulate the usage of renewable energy.

Level	Requirement					
Basic	Annual purchased electricity and direct on-site emissions associated with the final manufacturing stage of the product are quantified.	No issue expected				
Bronze	A renewable energy use and carbon management strategy is developed (if applicable).	No issue expected				
Silver	For the final manufacturing stage of the product, 5% of purchased electricity is renewably sourced or offset with renewable energy projects, and 5% of direct onsite emissions are offset.	No issue expected				
Gold	For the final manufacturing stage of the product, 50% of purchased electricity is renewably sourced or offset with renewable energy projects, and 50% of direct onsite emissions are offset.	No issue expected				
	For the final manufacturing stage of the product, >100% of purchased electricity is renewably sourced or offset with renewable energy projects, and >100% of direct on-site emissions are offset.	Challenging but feasible				
Platinum	The embodied emissions associated with the product from Cradle to Gate are characterized and quantified, and a strategy to optimize is developed. At reapplication, progress on the optimization plan is demonstrated.	No issue expected				
	≥ 5% of the embodied emissions associated with the product from Cradle to Gate are covered by offsets or otherwise addressed (e.g., through projects with suppliers, product re-design, savings during the use phase, etc.).	Challenging but feasible				

5.2 FINAL MANUFACTURING STAGE ELECTRICITY & ON-SITE EMISSIONS (BASIC)

To get insight in the electricty usage and on-site emissions, the final manucaturing stage of the product will be analysed. Electricty bills of the previous year are gathered and total usage per year – associated with the final manufacturing stage of the product – is calculated. Based on the total usage the percentage of renewable energy generated on location is allocated. If an applicant does not generate renewable electricity they can either buy renewable energy from their electricity supplier or buy renewable energy certificates (REC's). If production of the product causes any on-site emissions then these need to be offset. Offsetting usually occurs by investing in a project that neutralizes the same amount of CO_2 -emissions per year that is produced.





5.3 RENEWABLE ENERGY AND CARBON MANAGEMENT STRATEGY (BRONZE, SILVER, GOLD & PLATINUM)

If during the final manufacturing stage less then 100% renewable electricity is used and/or not all product relevant Greenhouse Gas emissions are offset then a Renewable Energy and Carbon Management Strategy is required. In this strategy, in consultation with the applicant, a goal is determined and actions with a timeline are formed. For recertification of the product, the applicant must provide an overview of actions taken over the previous period.

For wooden window frames SGS Search foresees no issues for an applicant to buy renewable electricity and/or REC's. However, it is advised that applicants look into generating their own renewable electricity, wind, hydro or solar. If current development of renewable energy production is considered, generating your own renewable energy should be no issue in the United Kingdom². SGS Search expects that in comparison with other products, the production of wooden window frames is not expected to require a lot of electricity. We assume no direct emissions are related to the final manufacturing process. Therefore a Gold level should be feasible.

² For more information see <u>https://www.gov.uk/government/collections/renewables-statistics</u>





6 WATER STEWARDSHIP

6.1 OVERVIEW

The Cradle to Cradle product standard addresses local geographic and industry water impacts at each manufacturing facility. If an applicant uses water which is in direct contact with the assessed product, it is mandatory to identify, assess and optimize any industrial chemicals in a facility's effluent (Silver level).

Level	Requirement					
Basic	The manufacturer has not received a significant violation of their discharge permit within the last two years or a discharge permit is not required.	No issue expected				
	A qualitative description of effluent management is provided.	No issue expected				
	Local- and business-specific water-related issues are characterized (e.g., the manufacturer will determine if water scarcity is an issue and/or if sensitive ecosystems are at risk due to direct operations).	No issue expected				
	A statement of water stewardship intentions describing what action is being taken for mitigating the identified problems and concerns is provided. At re-application, progress on action plans is demonstrated.	No issue expected				
Bronze	A facility-wide water audit is completed.	No issue expected				
	Product-related process chemicals in effluent are characterized and assessed OR product related process chemicals are not discharged to water systems because effluent is kept flowing in a closed loop system (i.e. product relevant effluent is produced but it is not released from the facility)	No product related effluent expected				
Silver	OR					
	Supply chain-relevant water issues for at least 20% of Tier 1 suppliers are characterized and a positive impact strategy is developed (required for facilities with no product-relevant effluent).	No issue expected				
Gold	Product-related process chemicals in effluent are optimized (chemicals identified as problematic are kept flowing in systems of nutrient recovery; effluents leaving facility do not contain chemicals assessed as problematic) OR not applicable.	No product related effluent expected				
	OR					
	Demonstrated progress on the strategy developed for the Silver level requirements (required for facilities with no product relevant effluent).	No issue expected				
Platinum	All water leaving the manufacturing facility meets drinking water quality standards OR product relevant effluent is kept flowing in a closed loop system.	No product related effluent expected				

6.2 STATEMENT ON VIOLATIONS OF WATER DISCHARGE PERMITS WITHIN THE PAST TWO YEARS (BASIC):

Applicants will need to provide a written statement that they did not have any water discharge related violation over the last two years, related in any way to the product up for certification. We do not foresee any mayor issues in this category because water discharge is highly regulated by local





government and the manufacturing of wooden window frames does normally not require water usage related to production.





6.3 LOCAL AND INDUSTRY-SPECIFIC WATER ISSUES RELATING TO THIS PRODUCT:

For all final manufacturing sites, local and industry-specific water issues are subject to review. Below, a general overview is provided of water issues in the United Kingdom. Please note that this will vary for each applicant depending on the location of the final manufacturing stage.

Water Issue	Answer
Watershed or catchment name	Vary per location
Major water sources within catchment	Vary per location
Major demands on sources	In general there are no issues with major demands. Water withdrawal per person has the lowest score. However, industrial withdrawal is relatively high.
Scarcity/stress level	The whole of The United Kingdom is free of water scarcity except the areas around London and Liverpool/Manchester. However there are no cases of water stress.
Access to improved water (% of population) and risk category (SHdb) or rating (WBCSD)	There are no issues with improved water (91- 100% of the population has access)
Access to improved sanitation (% of population) and risk category (SHdb) or rating (WBCSD)	There are no issues with improved sanitation (91-100 has access)
Impaired waterway, endangered wetland, or water bodies impacted by eutrophication, if any	There are some endangered wetlands and bodies impacted by eutrophication in The United Kingdom. These will only be an issue if they are near the manufacturing location.
Other issues	There are no other issues present.

6.4 STRATEGY FOR ADDRESSING WATER ISSUES IDENTIFIED (BASIC):

If any of the above mentioned issues results in a High or Very High risk score then the applicant has to devise a strategy to address that issue. The strategy must include a goal, actions to achieve those goals and a timeline. This is also done for Tier 1 suppliers with High or Very High risk scores. Considering the results indicated in par. 7.3 SGS Search does not foresee any issues for wooden window frame certification.

6.5 RESULTS OF WATER AUDIT (BRONZE):

At a bronze level or higher a facility wide water audit will be conducted. In this audit an overview is provided of all water usage of the final manufacturing stage(s) and the appropriate value is allocated to the product up for certification.

6.6 DRINKING WATER QUALITY (PLATINUM)

At a platinum level all water leaving the factory must meet local drinking water regulatory standards. This is demonstrated through routine analytical testing of the effluent. Applicants can also install a closed loop system to ensure no effluent is discharged.





7 SOCIAL FAIRNESS

7.1 OVERVIEW

With Social Fairness globally recognized resources are used to conduct assessments on local and supply chain issues. The category is aimed ensure the applicant makes a positive difference in the lives of employees and the local community.

Level	Requirement						
Basic	A streamlined self-audit is conducted to assess protection of fundamental human rights.	No issue expected					
	Management procedures aiming to address any identified issues are provided. Demonstration of progress on the management plan is required for re-application.	No issue expected					
Bronze	A full social responsibility self-audit is complete and a positive impact strategy is developed (based on UN Global Compact Tool or B-Corp).						
Silver	Material specific and/or issue-related audit or certification relevant to a minimum of 25% of the product material by weight is complete (FSC Certified, Fair Trade, etc.).	No issue expected					
	OR						
	Supply chain-relevant social issues are fully investigated and a positive impact strategy is developed.	Feasible					
	OR						
	The company is actively conducting an innovative social project that positively impacts employee's lives, the local community, global community, social aspects of the product's supply chain, or recycling/reuse.	Feasible					
Gold	Two of the Silver-Level requirements are complete.	Feasible					
Platinum	A facility-level audit is completed by a third party against an internationally recognized social responsibility program (e.g., SA8000 standard or B-Corp).	Feasible but requires extra investment					
	All Silver-Level requirements are complete.	Feasible					

7.2 STREAMLINED SELF-AUDIT (BASIC) AND FULL SELF-AUDIT (BRONZE)

A streamlined self-audit is required for the final manufacturing facility and all tier 1 suppliers. This audit takes into account the labour conditions and health and safety related issues per industry based on demographic and geographic information. If any of the categories are identified as having a High or Very High risk rating, management procedures to address risks have to be formed. For recertification, an applicant has to show progress on previously formed management procedures.

In case of wooden window frames three main industries in the United Kingdom have been subject to review (wood industry, metal industry and the chemical industry for the preservatives, sealants, adhesives, coating and polypropylene). Redwood used in the wooden window frame is normally grown in Finland so forestry in Finland is also investigated. Analysis shows that there are some risks that score a High and Very High risk rating. All industries in both countries have a High risk of toxicity or chemical exposure in the workplace which may result in loss of life by exposure to carcinogenic





substances. In all industries there is also a High risk of non-fatal injuries, for forestry in Finland this risk is even Very High. In the UK there is also a High chance of excessive work time. These scores will not prevent certification but will require the applicant to take extra steps. SGS Search does not foresee these steps to be too challenging. For example, applicants can add a section in their purchasing contracts stating that a supplier must comply with specific social requirements.

When aiming for a Bronze certification, a full audit is necessary. This audit is based on the UN Global Compact Tool or B Impact Assessment. These tools audit how a company performs on subjects such as management, labour, human rights, anti-corruption and the environment. Again, for any questions that cannot be positively answered a positive impact strategy has to be formed with goals, actions and a timeline.

7.3 SPECIFIC AUDITS, SUPPLY CHAIN INVESTIGATION & SOCIAL PROJECT (SILVER/GOLD/PLATINUM)

To reach Cradle to Cradle Silver level on this category an applicant has a choice out of three options. The first one is to have 25% or more of the product by weight certified with an issue-specific or material-specific certification. One example of such a certification is the FSC wood certificate. Another option is to further investigate the supply chain by conducting the streamlined self-audit for tier 2 suppliers. The final option is to create an innovative social project within the company that has a positive impact on stake holders. In this social project, employees must be actively involved and a positive impact on the community has to be achieved. If an applicant wants to achieve a Gold level on Social Fairness then two of the above mentioned options must be fulfilled.

7.4 FACILITY-LEVEL AUDIT BY THIRD PARTY (PLATINUM)

To achieve a Platinum level on Social Fairness a facility wide audit must be done by a third party and corresponding certificates must be obtained. The kind of audit and certification depends on the product and industry the applicant is in. Examples are B Corp Certification, Business Social Compliance Initiative (BSCI), Global Social Compliance Program (GSCP), SA 8000 (Social Accountability International), Worldwide Responsible Apparel Production (WRAP), etc.





APPENDIX I BANNED CHEMICAL TABLE

CRADLE TO CRADLE CERTIFIED BANNED CHEMICALS REPORTING TABLE V3.0

SUBSTANCE	CAS #	Intentionally Added Material#	Known Contaminant Material#	Concentration (ppm)	Comments
Metals					Metals are restricted to maximum background concentration in soils for BN
Arsenic	7440-38-2				
Chromium VI (hexavalent chromium)	18540-29-9				
Mercury	7439-97-6				
Cadmium	7440-43-9				
Lead	7439-92-1				
Flame Retardants					
Hexabromocyclododecane (HBCD)	3194-55-6; 25637-99-4				
Penta-BDE	32534-81-9				
Octa-BDE	32536-52-0				
Deca-BDE	1163-19-5				
Polybrominated Diphenyl Ethers (PBDEs)	Several				
Tetrabromobisphenol A (TBBPA)	79-94-7				
Tris(1,3-dichloro-2- propyl)phosphate	13674-87-8				
Phthalates					
Bis(2-ethylhexyl)phthalate	117-81-7				
Butyl benzyl phthalate	85-68-7				
Dibutyl phthalate	84-74-2				
Halogenated Polymers					
Polyvinyl chloride (PVC)	9002-86-2				
Polyvinylidenechloride (PVDC)	9002-85-1				
Chlorinated polyvinyl chloride (CPVC)	68648-82-8				
Polychloroprene	9010-98-4				
Polytetrafluoroethylene (PTFE)*	9002-84-0				
Chlorinated Hydrocarbons					
1,2-Dichlorobenzene	95-50-1				
1,3-Dichlorobenzene	541-73-1				
1,4-Dichlorobenzene	106-46-7				
1,2,4-Trichlorobenzene	120-82-1				
1,2,4,5-Tetrachlorobenzene	95-94-3				





Pentachlorobenzene	608-93-5		
Hexachlorobenzene	118-74-1		
PCB and Ugilec	Several		
Short-chain chlorinated paraffins	Several		
Other			
Pentachlorophenol	87-86-5		
Nonylphenol	104-40-5, 84852-15-3		
Octylphenol	27193-28-8		
Nonylphenol ethoxylates	Several		
Octylphenol ethoxylates	Several		
Tributyltin	688-73-3		
Trioctyltin	869-59-0		
Triphenyl tin	892-20-6		
Perfluorooctane sulfonic acid	1763-23-1		
Perfluorooctanoic acid	335-67-1		
Polycyclic Aromatic Hydrocarbons			
PAH group (as defined in TRI)	NA		
Benzo(a)pyrene	50-32-8		
5-Methylchrysene	3697-24-3		
Acenaphthene	83-32-9		
Anthracene	120-12-7		
Benz(a)anthracene	56-55-3		
Benz(j)aceanthrylene	202-33-5		
Benzo(b)fluoranthene	205-99-2		
Benzo(c)phenanthrene	195-19-7		
Benzo(g,h,I)perylene	191-24-2		
Benzo(j)fluoranthene	205-82-3		
Benzo(k)fluoranthrene	207-08-9		
Chrysene	218-01-9		
Cyclopenta(c,d)pyrene	27208-37-3		
Dibenzo(a,h)anthracene	53-70-3		
Dibenzo(a,h)pyrene	189-64-0		
Dibenzo(a,i)pyrene	189-55-9		
Dibenzo(a,I)pyrene	191-30-0		
Fluoranthene	206-44-0		
Fluorene	86-73-7		
Indeno(1,2,3,c,d)pyrene	193-39-5		
Naphthalene	91-20-3		
Phenanthrene	85-01-8		
Pyrene	129-00-0		





APPENDIX II MATERIAL HEALTH ANALYSIS WOOD & PRESERVATIVES