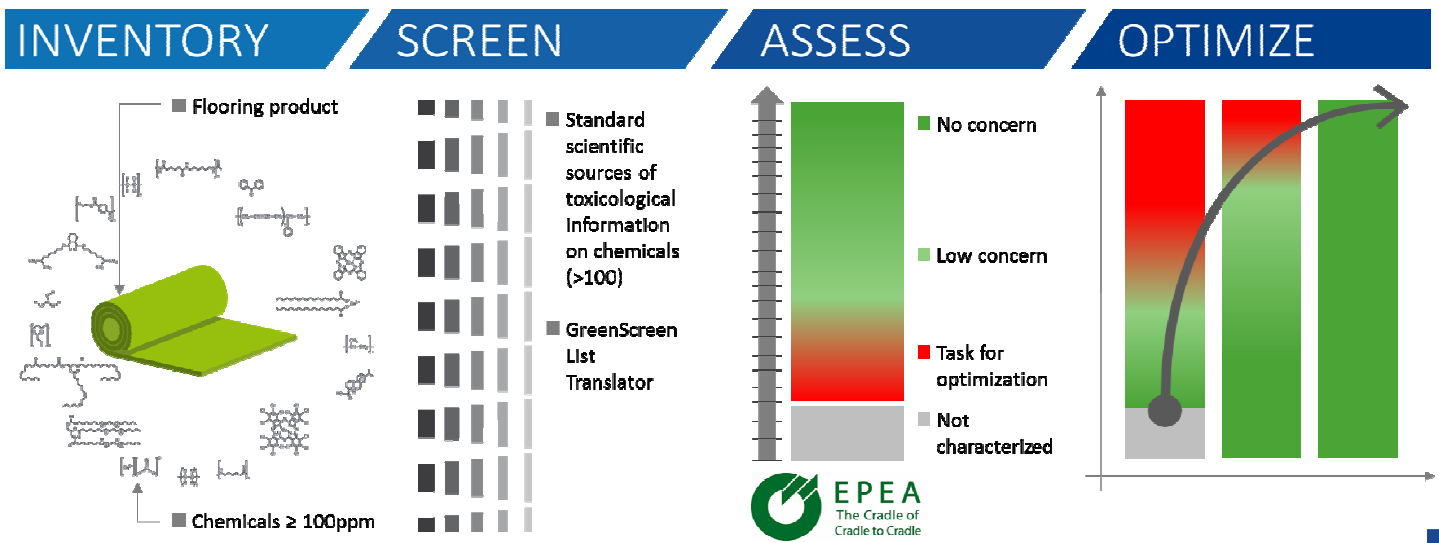


Tarkett's Path to Positive Optimization Strategy

It is estimated that we spend approximately 90% of our time indoors, therefore, it is important to consider the building materials with which we surround ourselves. Tarkett's goal is to design products that will enhance the human experience and allow us to live and work in spaces that promote health and well-being. Transparency and material reporting is essentially the first step but in order to make real and significant changes, we need to go a step further and not only inventory, screen and assess, but also optimize products for present and future uses.

At Tarkett, the optimization of our product compositions is at the core to our "Closed Loop, Circular Design" strategy powered by Cradle to Cradle® principles and the Circular Economy.

Tarkett's goal is to design our products today to be our raw materials of tomorrow, applying the first Cradle to Cradle® principle (Waste = Food), to select healthy and safe materials that can be perpetually cycled.



The Cradle to Cradle Product Optimization process is based on the following 4 steps:

- ⊙ **Material Inventory:** In collaboration with our suppliers, we inventory the raw materials used in our products to 100 ppm (parts per million) and identify them by Chemical Abstracts Service Registry Number (CASRN)
- ⊙ **Material Screening:** Individual chemicals are screened for their hazard rating using the Green Screen List Translator (GS-LT), along with more than 100 chemical hazard lists and scientific sources of toxicological information in use at EPEA (Environmental Protection and Encouragement Agency).
- ⊙ **Material Assessment:** Material Assessment: The product and its materials are assessed according to the Cradle to Cradle® principles and considering both the intrinsic hazard/safety properties of chemicals and occupant exposure. The product's environmental and health quality is assessed on the basis of a target scenario where materials involved in sourcing, production, use and post-use handling can serve as technical nutrients for future production or interact beneficially with exposed organisms and ecosystems as biological nutrients. The assessment is conducted by EPEA, the European Cradle to Cradle scientific research Institute based in Germany. For more information, please visit EPEA website (<http://www.epea.com/>).
- ⊙ **Optimization:** By using this third party material assessment methodology, our goal is to select materials that are safe, healthy and beneficial for humans and the environment and that can be perpetually cycled.

Thank you for considering our products and for your commitment to improving the built environment.

Diane Martel
Vice President of Environmental Planning and Strategy

Dhruv Raina
Product Sustainability Director

Tarkett Johnsonite rubber

Issued to: Tarkett
Issue date: March 13.2018
Expiration date: March 12.2020
Evaluation threshold: At least 100 ppm of the final product
After-use scenario: <http://tarkett.com/en/content/reuse-0>
EPEA Registry No: MHS V.2 - 39889.1
Product specifications: Tile with AO, Tile without AO, Metallurgy Rubber Tile, Triumph Rubber sports Flooring with AO, Triumph Rubber Sports Flooring without AO, Tread Cork only, Tread Cork/Walnut, Tile Cork/Walnut, Inertia Rubber Sports Flooring, Rubber Stair treads, Arcade Rubber sheet, Defiant, Vent Cove




Certificate 3039
Expires on 03.03.2019

CHEMICAL COMPONENTS		CASRN	CONTENT	EPEA RATING	COMMENT ON EPEA RATING	GS-LT/ GS-BM	REACH
Polymers	Polybutadiene	9003-17-2	25-50%	Green	Combination of natural and synthetic polymers varying with each product specification. Either no detection of monomers and typical rubber polymerization impurities in VOC tests or detection at levels far below strict Lowest Concentration of Interest (LCI) of European VOC Standards.	LT-UNK	✓
	Cis 1,4 Polyisoprene	9003-31-0				LT-UNK	✓
	Acrylnitrile butadiene copolymer	9003-18-3				LT-UNK	✓
	Styrene butadiene copolymer	9003-55-8				LT-UNK	✓
	Other	Proprietary 1				LT-UNK	✓
Fillers	Calcium carbonate	471-34-1	15-70%	Green	Organic and mineral fillers used, depending on each product specification. Most mineral fillers contain <1% quartz. A retrospective epidemiological study on the impact of inhalable dust on employees during a supplier's history of mining has demonstrated no increased cancer prevalence among their employees versus the general population	LT-UNK	✓
	Kaolin	1332-58-7				LT-UNK	✓
	Amorphous silica	112926-00-8				LT-UNK	✓
	Calcium silicate	1344-95-2				LT-UNK	✓
	Magnesium carbonate	546-93-0				LT-UNK	✓
	Proprietary	Proprietary 1 Proprietary 3				N.I.	✓
	Granulated cork	-				N.I.	✓
	Walnut shell	-				N.I.	✓
	Quartz	14808-60-7				LT-1	✓
Vulcanization agents	Various agents	Proprietary 1	0.5-5%	Green	Vulcanization agents create and catalyse formation of sulphur bridges between polymer molecules. Organic vulcanization accelerators are decomposed and lead to formation of substances susceptible to off-gas. Systems in use belong to most performant products in terms of prevention of carbon disulphide formation and don't contribute to the formation of carcinogenic nitrosamines.	LT-UNK	✓
	Sulfur	7704-34-9				LT-UNK	✓
	Sulfur homopolymer	9035-99-8				LT-UNK	✓
	Zinc oxide	1314-13-2				LT-P1	✓
Anti-oxidants	Proprietary	Proprietary 1	<1%	Green		LT-P1	✓
						LT-1	✓
						LT-UNK	✓
Process aids	Calcium oxide	1305-78-8	0.2-8%	Green	Processing aids have a functional purpose in the rubber production process or had it to produce inputs by suppliers. Conditions for petroleum distillates not to be classified for carcinogenicity are fulfilled	LT-1	✓
	Paraffin wax	64742-43-4				LT-UNK	✓
	Stearic acid	57-11-4				LT-UNK	✓
	Microcrystalline wax	64742-60-5				LT-UNK	✓
	Other processing aids	Proprietary 1, 2, 3				BM2, LT-1 LT-P1, LT-UNK, N.I.	✓
	Mineral flame retardants	Proprietary 1	2-5%	Green	Safe mineral flame retardants	BM2	✓
						N.I.	✓





CHEMICAL COMPONENTS	CASRN	CONTENT	EPEA RATING	COMMENT ON EPEA RATING	GS-LT/ GS-BM	REACH	
Pigments	Titanium dioxide	13463-67-7	0.5-1.5%	Potential health issues related to dust inhalation during production of mineral pigments. No concern in the finished product. Contained halogens in organic pigments determine the red rating. One pigment isn't defined even in the perspective the supplying masterbatch manufacturer	LT-1	✓	
	Carbon black	1333-86-4			BM1	✓	
	Pigment red 101	1309-37-1			BM2	✓	
	Pigment yellow 42	51274-00-1			LT-UNK	✓	
	Other pigments	Proprietary 2 Proprietary 3				LT-UNK	✓
						BM3	✓
			LT-UNK	✓			
			N.I.	-			
Other	Recycled content	-	0-29%	Consists currently exclusively of internal post-manufacturing material of Tarkett's production. Same off-gassing behaviour expectable for the recycled content, as with virgin materials used to make it.	N.I.	✓	
	Undefined	-	<0.15%	Aggregated residual lack of chemical definition from various inputs mostly consisting of the non-polyisoprene part of natural rubber	N.I.	-	

EPEA'S RATING METHODOLOGY IS BASED ON THE CRADLE TO CRADLE APPROACH WITH THE EUROPEAN PRECAUTIONARY PRINCIPLE. IT IS MADE IN RELATION WITH A QUALITY TARGET, AN AFTER-USE SCENARIO AND ON THE BACKGROUND OF THE SPECIFIC SUPPLY CHAIN MATERIALS USED BY THE ARTICLE'S MANUFACTURER. THE ASSESSMENT OF HAZARD/SAFETY PROPERTIES OF CHEMICALS IS MADE AT THE BEST OF OUR KNOWLEDGE AT THE DATE OF MHS™ ISSUE: (SEE [MHS DEVELOPMENT GUIDELINE V2.0](#)). EPEA BELIEVES THE DATA FORTH HEREIN ARE ACCURATE AS OF THE DATE HEREOF. EPEA MAKES NO WARRANTY WITH RESPECT THERETO AND EXPRESSLY DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. SUCH DATA ARE OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION AND VERIFICATION.


Michael Braungart
 CEO
 EPEA Internationale Umweltforschung GmbH


Alain Rivière
 Senior Scientist
 EPEA Internationale Umweltforschung GmbH

Legend:

EPEA RATING:	REACH compliance:	GS-LT*	GS- BM*
 No concern	✓ : Substance complies with REACH regulation European Union Regulation EC 1907/2006 applicable to this article or substance is listed neither in Annex XIV nor in Annex XVII nor as SVHC	LT-1: Chemical is found on an authoritative list of the most-toxic chemicals	BM1: Avoid: Chemical of High Concern
 Moderate concern	XVII or XIV: Substance listed in Annex XVII (Restriction) or Annex XIV (Authorisation) of REACH regulation applicable to this article	LT-P1: Chemical may be a serious hazard, but the confidence level is lower	BM2: Use but search for Safer Substitutes
 High concern – Task for material optimization	SVHC: Substance of Very High Concern. Candidate for listing in Annex XIV (Authorization list) of REACH Regulation at a concentration above 0.1%	LT-UNK: Unknown (no data on List Translator Lists)	BM3: Use but still opportunity for improvement
 Unknown concern – Task for knowledge development			BM4: Prefer: Safer Chemical
			BMU: "Unspecified"; insufficient data
			N.I. (No GS rating): Chemical is not listed in the source of GS and GS-LT ratings

* GreenScreen List Translator Score and GreenScreen Benchmark Score according to Toxnot classification (<https://toxnot.com/>)

Proprietary 1, 2 or 3: Distinguishing between owners of information (see [MHS Development Guideline V2.0](#))

LEED v4 – Score Card

Johnsonite Rubber Sheet

PRODUCTS COVERED Arcade Rubber sheet, Arcade Tonal Rubber sheet

MATERIAL & RESOURCES

MRc2. Building product disclosure and optimization – Environmental Product Declarations

- Option 1: Environmental Product Declaration (EPD) – 1 point
- Product-specific EPD Industry-wide (generic) EPD Product-specific declaration
- Option 2: Multi-attribute Optimization – 1 point
- 3rd party certified products that demonstrate impact reduction below industry average

MRc3. Building product disclosure and optimization – Sourcing of Raw Materials

- Option 1: Raw Material Source and Extraction Reporting – 1 point
- U.N. Global Compact GRI Sustainability Report ISO 26000 OECD
- Option 2: Leadership Extraction Practices – 1 point

Bio-based materials	Pre-Consumer	Post-Consumer	Manufacturing Location	Extended Producer Responsibility
-	-	-	Middlefield, OH	Yes (ReStart® program)

MRc4. Building product disclosure and optimization – Material Ingredients

- Option 1: Material Ingredient Disclosure – 1 point
- Manufacturing Inventory Cradle to Cradle Certification Declare HPD
- Option 2: Material Ingredient Optimization – 1 point
- Cradle to Cradle Certification GreenScreen Benchmark REACH Other

MRc5. Construction and demolition waste management

- Reclamation and recycling program proposed – Tarkett's ReStart® program

INDOOR ENVIRONMENTAL QUALITY

EQc1. Enhanced Indoor Air Quality strategies

- Enhanced IEQ Strategies – Abrasive Action entry walk-off systems – 1 point

EQc2. Low-emitting materials

- Certification compliant with California Department of Public Health (CDPH) – FloorScore®
- TVOC emissions 0.5 mg/m³ or less Between 0.5 and 5.0 mg/m³ 5.0 mg/m³ or more

For more information please contact us: mhs@tarkett.com



THE ULTIMATE
FLOORING EXPERIENCE