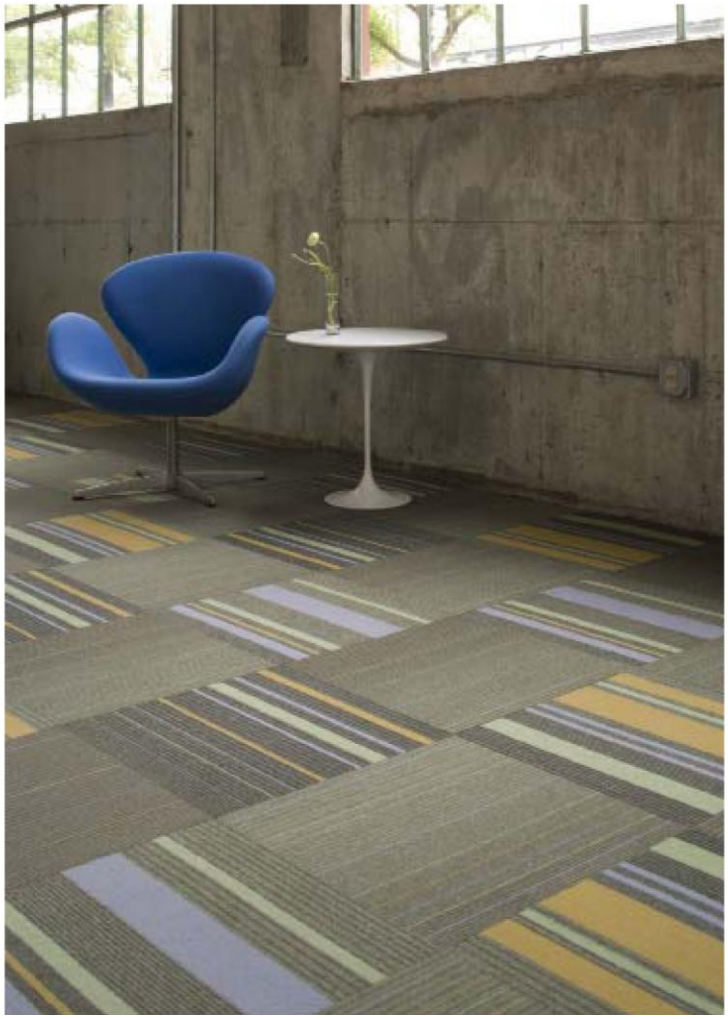
ENVIRONMENTAL PRODUCT DECLARATION

Carpet Tile: GlasBac®, Type 6 Nylon

Interface Asia Pacific
Manufactured in Thailand
Modular Carpet on GlasBac®
Recycled Nylon 6 Styles

According to ISO 14025



Interface®

Interface, Inc., is the world's largest manufacturer of commercial carpet tile. First established in 1973, the company has consistently led the industry through innovation and now leads the industry in environmental sustainability.

Interface sets the pace for the development of modular carpet using materials and processes that take less from the environment, well down the path to "Mission Zero®," the company's promise to eliminate any negative impact it has on the environment by the year 2020.

As part of a worldwide enterprise, Interface's manufacturing facilities maintain third party registration to the ISO 14001 Environmental Management System standard. The company is recognized globally for its commitment to build environmental considerations into its business decisions.

For more information visit www.interface.com

CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION

Modular carpet tile made with post-consumer content non-virgin backing and high recycled content type 6 nylon, including post-consumer and post industrial material.

Environment

ENVIRONMENTAL PRODUCT DECLARATION
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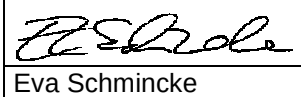
This declaration is an environmental product declaration in accordance with ISO 14025 that describes the environmental characteristics of the aforementioned product. It promotes the development of sustainable products. This is a certified declaration and all relevant environmental information is disclosed.

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Interface
DECLARATION NUMBER	110919.11CA29311.118.1
DECLARED PRODUCT	Modular carpet with solution dyed Nylon 6 (polyamide 6) yarn on GlasBac® backing manufactured by Interface in Chonburi Thailand.
REFERENCE PCR	PCR-Floorcoverings Harmonised Rules for Textile, Laminate and Resilient Floor Coverings

DATE OF ISSUE	January 6, 2012
PERIOD OF VALIDITY	5 years

CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	Insitut Bauen und Umwelt e.V
	Accepeted by the Advisory board
	Rheinufer 108 53639 Königswinter Germany info@bau-umwelt.com
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☑ EXTERNAL	
	Loretta Tam
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	
	Eva Schmincke

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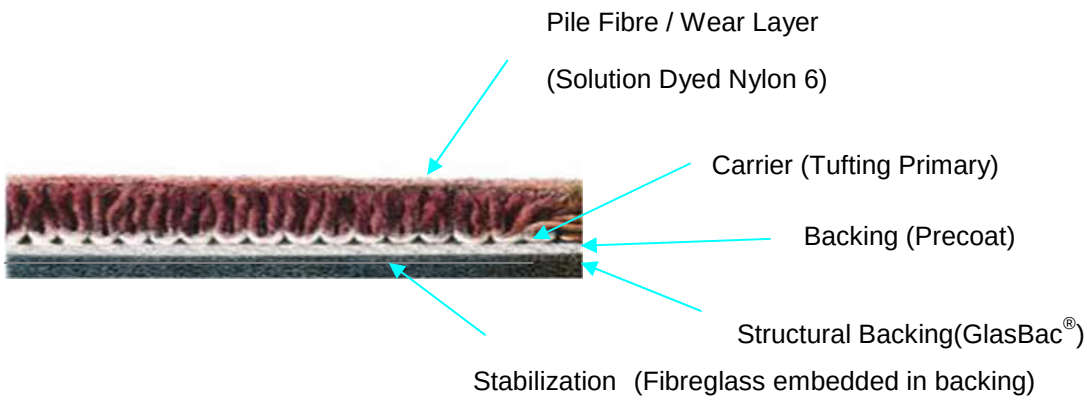
Product Definition

Modular carpet with solution dyed Nylon 6 (polyamide 6) yarn face cloth combined with GlasBac® backing. The products are manufactured by Interface in Chinaberry Thailand.

Product Classification and Description

This declaration covers a broad range of styles and colours, all of which contain solution dyed Nylon 6 yarn and GlasBac® structural backing. The variation between products is yarn weight. The yarn weight ranges from a low of 407 grams /square meter to a high of 949 grams/square meter. The impact data will be presented for the mid weight products of 712 grams yarn per square meter. Figures 17 and 18 display the results for products of additional yarn weights.

Figure 1. Diagram of product construction



Definitions

- **Pile Fibre / Wear Layer** – Tufts of solution dyed, Nylon 6 yarns.
- **Carrier** – nonwoven tufting primary, a polyester fabric, into which the wear layer is tufted.
- **Backing (Precoat)** – a latex coating which bonds the tufts into the carrier
- **Stabilization (Fibreglass**) – a nonwoven fibreglass fabric embedded in the structural backing which provides dimensional stability.
- **Structural Backing** (**GlasBac®)** – a polyvinyl chloride (vinyl) backing containing post industrial recycled content which gives structure and dimensional stability to the modular carpet.

Range of Applications

Modular installation of textile floor covering in commercial buildings

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Product Standards and Approvals

• ASTM E-648 Radiant Panel	Class 1
• ASTM E-662 Smoke Density	≤ 450
• ISO 9239-1:2002	Class C_{fl}
• BS 6307 / ISO 6925 Methenamine Pill	Radius ≤ 12 cm
• AATCC -134 Static	< 3.0 KV
• BS ISO 6356 Body Voltage Walk Test	≤ 2 kV
• AATCC 16-E Light fastness	≥ 4.0 @ 60 AFUs
• ISO 2551/ASTM D 7570 Dimensional Stability	< 0.10 %
• BS EN 985 Castor Chair Test	r ≥ 2.4
• BS ISO 10361:2000 Vetterman Drum	≥ 3-4

Accreditation

- CRI Green Label Plus
- Silver NSF140 Sustainable Carpet Assessment
- Carbon Reduction Label for Products – Thailand Greenhouse Gas Management Organization
- ISO9001 Quality Management System
- ISO14001 Environmental Management System

FM 40957 EMS 60261

Delivery Status

Figure 2. Specification of product construction

Characteristics		
Type of manufacture	Tufted Textured Loop, Tufted Cut and Loop, Tufted Tip Sheared, or Tufted Cut Pile	
Pile fibre composition	Solution-dyed Nylon 6	100%
Carrier	Polyester	100%
Backing	GlasBac® with 62% recycled material	100%
	Nominal values	**Unit**

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Surface pile weight	407 – 949	g/m^2
Total Carpet Weight	3921 – 4463	g/m^2

Material Content

Material Content of the Product

Layer	Component	Material	Availability	Mass %	Origin
Wear Layer	Face Cloth/Yarn	Nylon 6	Fossil resource, limited	14%	US/IT
		Recycled Nylon 6	Recycled material, abundant	3%	US/IT
Carrier	Tufting Primary	Recycled polyester	Recycled material, abundant	1%	TW/TH
		Polyester	Fossil resource, limited	2%	TW/TH
Backing	Latex	Ethylene vinyl acetate	Fossil resource, limited	5%	CN
	Filler	Recycled $CaCO_3$	Recycled mineral resource, abundant	14%	TH
Stabilization	Fibreglass	Silica	Mineral resource, non renewable, abundant	2%	UK
Structural Backing	GlasBac® Backing	Polyvinyl chloride homopolymer	Ethylene – Fossil resource, limited and Salt – Mineral resource, non renewable, abundant	13%	TH
		di-isononyl phthalate	Fossil resource, limited	9%	SG
		Recycled $CaCO_3$	Recycled mineral resource, abundant	37%	TH

Production of Main Materials

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Nylon 6- Nylon 6 granulate produced from the polymerization of caprolactam which is sourced from petroleum

Post Consumer and Post Industrial content Nylon 6 - Produced by the shaving of fibres from post consumer carpet, depolymerization of this fibre fluff, fishing nets, and post industrial Nylon 6 into caprolactam, repolymerization of the monomer to Nylon 6, and extrusion into yarn.

Polyester - Synthetic fibre material, often polyethylene terephthalate produced by the polymerization of terephthalic acid and ethylene glycol.

Ethylene vinyl acetate - A copolymerization product of ethylene and vinyl acetate.

Recycled calcium carbonate - post industrial recycled limestone filler

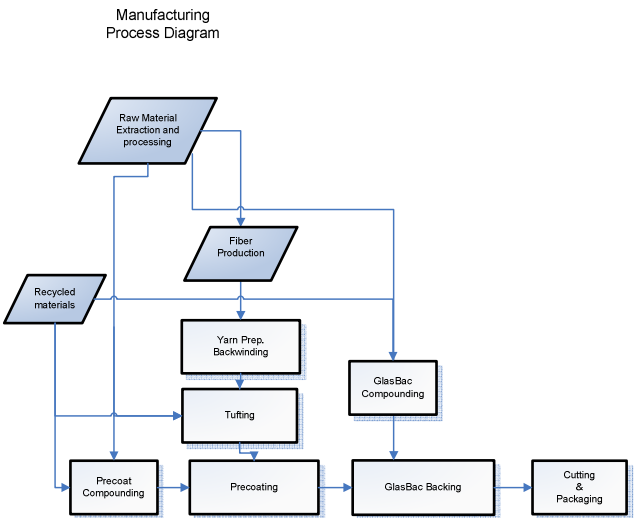
Glass - Produced by fusion of sand and other silicate fillers.

Polyvinyl chloride – thermoplastic material which is made by polymerization of vinyl chloride monomer which is produced from salt and petroleum sourced ethylene.

Di-isononyl phthalate - DINP is produced by the reaction of iso-nonyl alcohol and phthalic anhydride.

Production of the Floor Covering

Figure 3. Diagram of production process



Health, Safety, and Environmental Aspects During Production

- ISO 14001 Environmental Management System
- SocioMetrics, measuring and improving social aspects of our business including worker safety

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- Compliance with PHE (Public Health and Environment) requirements within NSF140 Sustainable Carpet Standard.

Delivery and Installation of the Floor Covering

Delivery

The product is most commonly transported by truck. For the life cycle assessment, a 34-40 tonne truck with 85% utilization of its payload and an average transportation of 805 kilometers to the place of installation is assumed.

Installation

Installation of this product does not require adhesive application, but is done using TacTiles® preventing damage to the subfloor, increasing ease of removal and recycling, and installation during occupancy. If TacTiles® are not used, the recommended installation adhesive is InterTac, a water based acrylic. For full installation instructions, see the Interface Installation Guide.

Health, Safety, and Environmental Aspects Suring Installation

The VOCs associated with traditional flooring adhesives are avoided for both the installers and the building occupants by TacTile® installation method. Carpet tile does not require a foam cushion underlayment used in traditional broadloom carpet installations. The TacTile® method creates a floating floor, preventing damage to the subfloor and simplifying removal at end of life.

Waste

Waste is minimized by the modular aspect of the carpet tile. While installation waste can be sent to landfill or incineration, the preferred method is recycling through Interface's ReEntry® 2.0 take back program by contacting the local Interface Country Business Manager.

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Packaging

Carpet tiles are packaged in recycled cardboard boxes (93% post consumer recycled content cardboard). Packaging waste should be recycled through local cardboard recycling.

Use Stage

The product is warranted for a service life of 15 years of heavy use. However carpets are often replaced before their service life expires due to fashion. Carpet and Rug Institute Carpet Maintenance Guidelines for Commercial Applications, which includes regular vacuuming and intermittent extraction cleaning. http://carpet-rug.com/commercial-customers/cleaning-and-maintenance/index.cfm

Cleaning and Maintenance

Figure 4. Cleaning and maintenance

Level of Use	Cleaning Process	Cleaning Frequency	Consumption of energy and resources
Commercial (heavy traffic)	Vacuuming	Daily	Electric energy
	Extraction cleaning	Twice per year	Electric energy Water Detergent

Prevention of Structural Damage

See section on Mechanical Damage

Health Aspects During Usage

Conforms to CRI Green Label Plus indoor air quality testing program. http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/carpet-and-adhesive

Singular Effects

Fire

Radiant Panel: Class 1 (ASTM E-648)

Smoke Density: ≤ 450 (ASTM E-662)

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ISO 9239-1:2002: Class C_{fl}

BS 6307 / ISO 6925 Methenamine Pill: Radius $\leq$ 12 cm

Water Damage

The product backing is impervious to moisture protecting the subfloor from leaks and spills. Exposure to flooding for long periods may result in damage to the product.

Mechanical Damage

Product is intended for commercial applications with heavy wear (BS ISO 10361:200 Vetterman Drum Test Commercial Heavy Use classification under EN 1307:2008 Textile Floor). Product should be installed according to Interface installation guidelines

End of Life Stage

Recycling or Reuse

Product should be recycled through Interface's ReEntry® 2.0 process by contacting the local Interface Country Business Manager. To find this local representative contact Interface Asia at Interface (Thailand) Co., Ltd. 700/117 M.1 Amata Nakorn Industrial Estates, Baankao, Panthong, Chonburi 20160, Thailand, t:+66 (0)38 214303-5

Disposal

Recycling of the product through Interface's ReEntry® 2.0 process is strongly recommended, but disposal in municipal landfill or commercial incineration facilities is permissible in compliance with local regulations.

Life Cycle Assessment

General

A total Life Cycle Assessment was completed in accordance with ISO 14040 / ISO 14044.

Life Cycle Stages assessed:

- Production Stage
- Installation Stage
- Use Stage
- End of Life Stage

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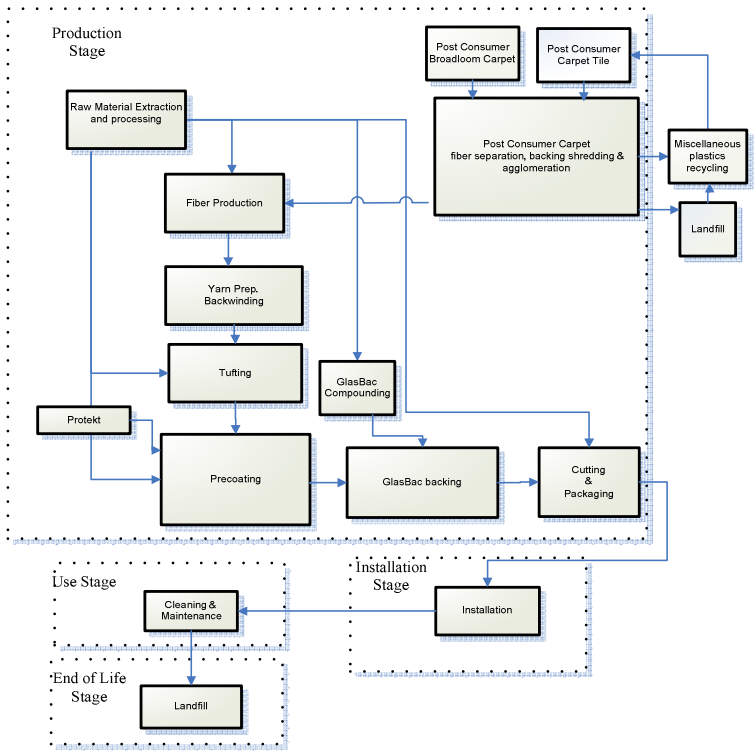
Figure 5. Life cycle stages diagram



Description of the Declared or Functional Unit

One square meter of installed modular carpet for heavy use. The use stage is considered for one year of service life. The reference flow is one square meter of modular carpet.

Cut-off Criteria

The cut-off criteria established for the study include or exclude materials, energy and emissions data. For the purposes of this study, the criteria are as follows:

- Mass – If a flow is less than 1% of the mass of the modelled product it may be excluded, providing its environmental relevance is not a concern.
- Energy – If a flow is less than 1% of the cumulative energy of the model it may be excluded, providing its environmental relevance is not a concern.
- Environmental relevance – If a flow meets the above criteria for exclusion, yet is thought to potentially have a significant environmental impact, it will be included.

The total excluded flows do not exceed 5% of overall life cycle.

Allocation

Where relevant, the background data incorporates some allocation as in the power mix, where possible appropriate geographical grid mixes were used. No upstream impacts were allocated to recycled materials. End of life burdens of recycled materials were allocated to the input of those materials in the production stage.

Background Data

Gabi 5 software system was used for modeling the life cycle of the modular carpet.

Data Quality

For the data used in this LCA, the data quality is considered to be “good to high” quality. The definition of this quality range stems from the following descriptions. The data and data sets cover all relevant process steps and technologies over the supply chain of the represented carpet products. The LCIs from the GaBi database and Plastics Europe are mainly based on industry data and are completed, where necessary, by secondary data. The operations data is representative of a sufficient sampling over and adequate period of time. The temporal correlation falls under a three year window for the vast majority of data considered. The geographical correlation is slightly challenging as there is very little life cycle information available that is country specific in every facet. For Interface, there is a reliance on data produced from European sources with country specific considerations during the LCI creation. Given that the data is from similar production conditions and representative of the technology and production paths used by Interface’s direct suppliers, this is acceptable to Interface and deemed to have an appropriate level of quality. A possible source of uncertainty from geographical sources is the incorporation of European electricity grid mixes into many of the LCIs that are used.

System Boundaries

The Life Cycle Assessment includes all relevant cradle-to-grave environmental information for one square meter of carpet. The system boundaries include raw material production and processing, carpet manufacturing, energy production, packaging, transportation, carpet installation, use and maintenance, as well as the end-of-life options (recycling, incineration or landfill disposal).

Notes on the Use Stage:

The warranted service life of the product is 15 years. The use stage includes both vacuuming and extraction cleaning according to the maintenance guidelines of the Carpet & Rug Institute and accounts for the electricity, water, and cleaning agents consumed. The use stage impacts have been annualised.

Results of the Assessment

The LCA results are documented separately for the stages:

- Production Stage
- Installation Stage
- Use Stage
- End of Life Stage

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Life Cycle Inventory Analysis

The total primary energy for the product can be separated into life cycle stages and the energy for the production stage can be further separated into the energy from primary (virgin) materials, secondary (recycled) materials, and process energy.

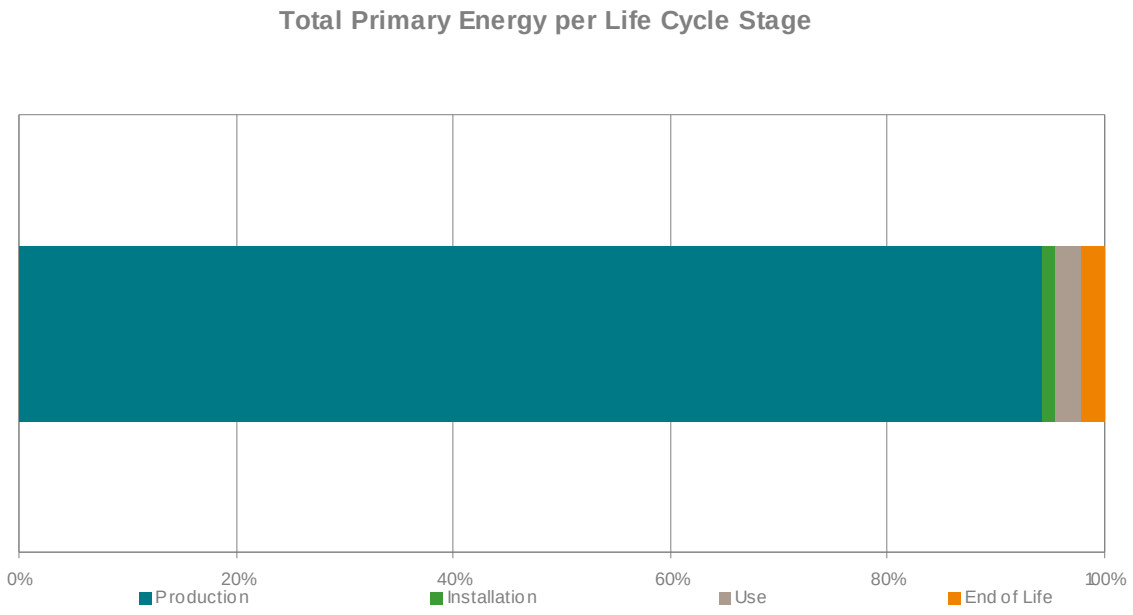
Figure 6. Use of total primary energy for the all life cycle stages from renewable and nonrenewable resources

Unit	Total Life Cycle	Production			Installation	Use*	End of Life
		221.22					
MJ	234.69	Primary material	Secondary material	Internal Processing	2.85	5.53	5.09
		206.29	3.10	11.83			

* service life of 1 year

Over ninety percent of the primary energy is in the production stage of the life cycle with very small contributions from the installation, use, and end of life stages as seen in Figure 7.

Figure 7. Relative total primary energy by life cycle stage for a medium yarn weight product (712 gram/square meter yarn weight)



The primary energy can be further separated into renewable and non-renewable resources as shown in Figure 8. The relative contribution of renewable and non-renewable resources is shown in Figure 9.

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Figure 8. Primary energy of all life cycle stages separated into nonrenewable and renewable resources by source type for a medium yarn weight product (712 gram/square meter yarn weight)

Non- renewable Primary energy by resources	Unit	Total Life Cycle	Production	Installation	Use*	End of Life
Total nonrenewable primary energy	MJ	229.18	216.25	2.75	5.30	4.88
Crude oil	MJ	83.28	79.11	2.29	0.52	1.35
Hard coal	MJ	21.21	20.55	0.05	0.27	0.34
Lignite	MJ	7.88	6.78	0.01	0.83	0.26
Natural gas	MJ	104.62	97.98	0.36	3.57	2.71
Uranium	MJ	12.20	11.83	0.04	0.12	0.21
Renewable primary energy by resources	**Unit**	**Total Life Cycle**	**Production**	**Installation**	**Use***	**End of Life**
Total renewable primary energy	MJ	3.43	2.90	0.10	0.23	0.21
Hydropower	MJ	1.74	1.58	0.00	0.11	0.04
Wind / Wave Power	MJ	0.87	0.71	0.00	0.11	0.05
Solar Energy / Biomass/ Renewable Fu	MJ	0.66	0.45	0.08	0.01	0.11
Geothermal	MJ	0.11	0.10	0.00	0.00	0.00

Figure 9. Primary energy of all life cycle stages separated into nonrenewable and renewable resources (712 gram/square meter yarn weight)

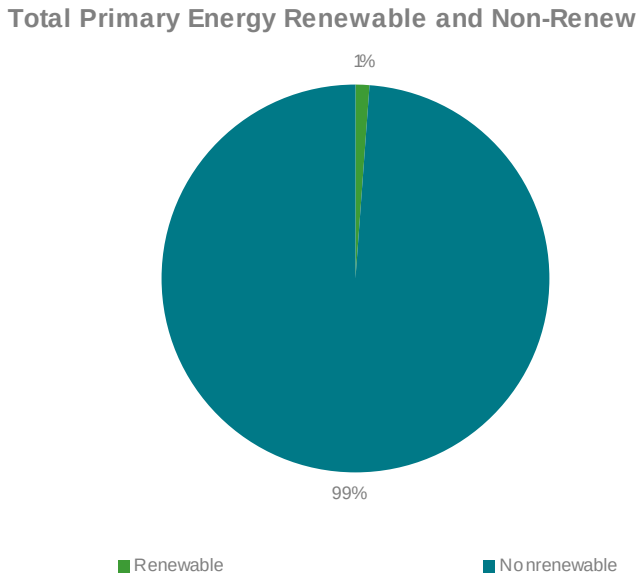

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Figure 10. Contribution of different resources to nonrenewable primary energy

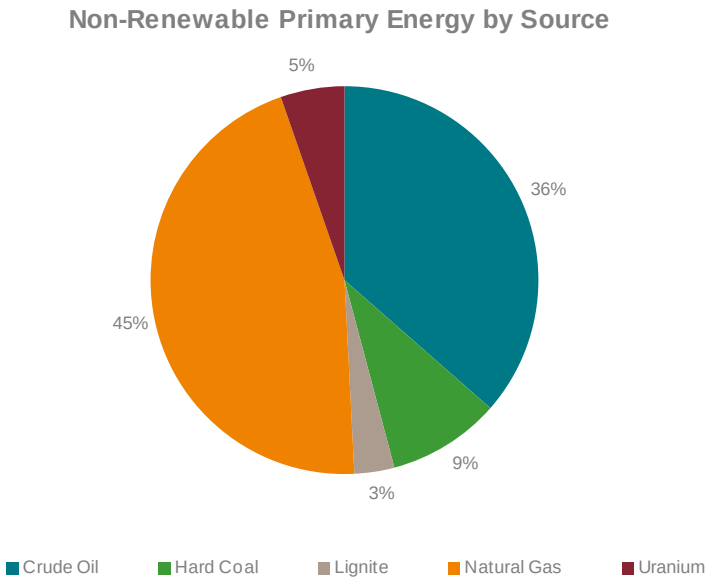
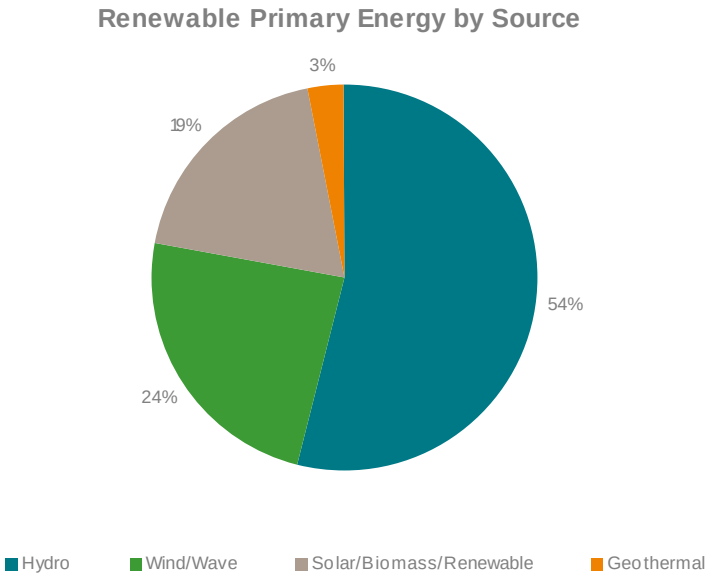


Figure 11. Contribution of different resources to renewable primary energy



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Non-renewable material resources, water consumption and wastes

The life cycle of the product consumes non-renewable resources and water while producing non-hazardous, hazardous, and radioactive wastes. The quantities, separated into contribution per life cycle stage, are shown in Figure 12 for a medium yarn weight product.

Figure 12. Non-renewable material resources and water consumption per square meter of product and by life cycle stages

	Unit/ m^{2*}	Total Life Cycle	Production	Installation	Use	End of Life
Resources						
Nonrenewable resources	kg	7.93	5.90	0.04	0.80	1.20
Water	m^3	1.19	0.90	0.01	0.12	0.16
Wastes						
Non-hazardous waste	kg	11.19	5.75	0.10	0.75	4.58
Hazardous waste	kg	0.0539	0.0538	0.0001	0.0000	0.0000
Radioactive waste	kg	0.0014	0.0013	0.0000	0.0000	0.0001

*resource or waste amount per square meter of product

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Life Cycle Impact Assessment

Figure 13. The potential impacts per life cycle stage

	Production	Installation	Use	End of Life	Units/sq meter
US TRACI 2.0					
TRACI, Acidification Air	0.05	0.00	0.00	0.00	mol H+ Equiv.
TRACI, Eutrophication	0.0039	0.0000	0.0002	0.0005	kg N-Equiv.
TRACI, Global Warming Air	13.05	0.19	0.46	0.32	kg CO_2-Equiv.
TRACI, Ozone Depletion Air	1.33E-06	1.10E-09	2.77E-09	1.18E-09	kg CFC 11-Equiv.
TRACI, Smog Air	0.63	0.03	0.02	0.02	kg NOx-Equiv.
CML					
CML, Abiotic Depletion (ADP elements)	5.94E-05	8.69E-09	2.21E-07	5.89E-08	kg Sb-Equiv.
CML, Acidification Potential (AP)	0.055	0.001	0.001	0.001	kg SO_2-Equiv.
CML, Eutrophication Potential (EP)	0.0073	0.0002	0.0002	0.0011	kg Phosphate-Equiv.
CML, Global Warming Potential (GWP 100 years)	13.10	0.19	0.46	0.32	kg CO_2-Equiv.
CML, Ozone Layer Depletion Potential (ODP, steady state)	1.01E-06	8.59E-10	2.56E-09	1.11E-09	kg R11-Equiv.
CML, Photochem. Ozone Creation Potential (POCP)	0.0069	0.0001	0.0001	0.0001	kg Ethene-Equiv.

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Figure 14. Total potential impacts for one square meter of carpet low, medium, and high face weights

	Yarn weight			Units
	441	712	949	grams/square meter
	13	21	28	ounces/square yard
PCR Impact Category	**Impact**			**Units**
US TRACI 2.0				
TRACI, Acidification Air	0.04	0.06	0.07	mol H+ Equiv.
TRACI, Eutrophication	0.0034	0.0047	0.0057	kg N-Equiv.
TRACI, Global Warming Air	11.08	14.03	16.61	kg CO_2-Equiv.
TRACI, Ozone Depletion Air	1.33E-06	1.34E-06	1.34E-06	kg CFC 11-Equiv.
TRACI, Smog Air	0.56	0.70	0.82	kg NOx-Equiv.
CML				
CML, Abiotic Depletion (ADP elements)	4.28E-05	5.97E-05	7.44E-05	kg Sb-Equiv.
CML, Acidification Potential (AP)	0.046	0.058	0.068	kg SO_2-Equiv.
CML, Eutrophication Potential (EP)	0.0067	0.0089	0.0107	kg Phosphate-Equiv.
CML, Global Warming Potential (GWP 100 years)	11.11	14.08	16.67	kg CO_2-Equiv.
CML, Ozone Layer Depletion Potential (ODP, steady state)	1.01E-06	1.02E-06	1.02E-06	kg R11-Equiv.
CML, Photochem. Ozone Creation Potential (POCP)	0.0063	0.0072	0.0081	kg Ethene-Equiv.

Figure 15. Life cycle stages as a percentage of total CML impacts

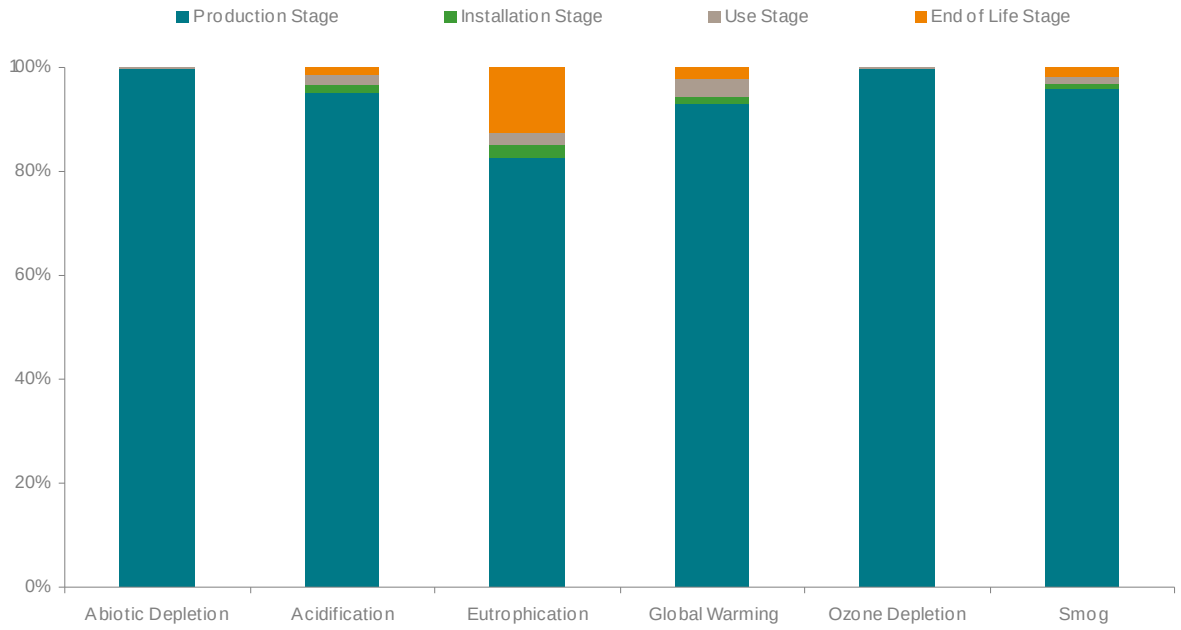

Figure 16. Distribution of the environmental impacts to the different stages of the life cycle

Impact Category	Production Stage	Installation Stage	Use Stage	End of Life Stage
Abiotic Depletion	100%	0%	0%	0%
Acidification	95%	2%	2%	2%
Eutrophication	83%	2%	2%	13%
Global Warming	93%	1%	3%	2%
Ozone Depletion	100%	0%	0%	0%
Smog	96%	1%	1%	2%

Figure 17 provides the impact, wastes, material and energy consumption information for additional yarn weight products.

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Figure 17. Total Life Cycle Resources and CML impacts of additional yarn weights

Yarn Weight																	
grams/square meter	407	441	475	509	542	576	610	644	678	712	746	780	814	848	881	915	949
ounces/square yard	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Abiotic Depletion (kg)	4.1E-05	4.3E-05	4.5E-05	4.7E-05	4.9E-05	5.1E-05	5.3E-05	5.5E-05	5.8E-05	6.0E-05	6.2E-05	6.4E-05	6.6E-05	6.8E-05	7.0E-05	7.2E-05	7.4E-05
Acidification (kg)	0.045	0.046	0.048	0.049	0.051	0.052	0.053	0.055	0.056	0.058	0.059	0.061	0.063	0.064	0.065	0.067	0.068
Eutrophication (kg)	0.006	0.007	0.007	0.007	0.008	0.008	0.008	0.008	0.009	0.009	0.009	0.009	0.010	0.010	0.010	0.010	0.011
Global Warming (kg)	10.74	11.11	11.48	11.85	12.22	12.59	12.96	13.33	13.70	14.08	14.45	14.82	15.24	15.57	15.93	16.30	16.67
Ozone Depletion (kg)	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1E-06	1E-06	1E-06	1.0E-06	1.0E-06	1E-06	1E-06
Smog (kg)	0.0061	0.0063	0.0064	0.0065	0.0066	0.0067	0.0069	0.0070	0.0071	0.0072	0.0073	0.0075	0.0076	0.0077	0.0078	0.0079	0.0081
Primary Energy (MJ)	189.63	194.65	199.68	204.70	209.57	214.60	219.62	224.64	229.67	234.69	239.71	244.73	250.35	254.78	259.66	264.68	269.70
Nonrenewable Resource (kg)	6.73	6.86	7.00	7.13	7.26	7.40	7.53	7.66	7.80	7.93	8.07	8.20	8.35	8.47	8.60	8.74	8.87
Water Consumption (m3)	0.936	0.964	0.993	1.021	1.049	1.078	1.106	1.135	1.163	1.192	1.220	1.249	1.281	1.306	1.333	1.362	1.391
Non hazardous Wastes (kg)	9.68	9.85	10.01	10.18	10.35	10.51	10.68	10.85	11.02	11.19	11.35	11.52	11.71	11.86	12.02	12.19	12.36
Hazardous Wastes (kg)	0.053	0.053	0.053	0.053	0.053	0.053	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.055	0.055	0.055
Radioactive Wastes (kg)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002

Figure 18. Production Stage impacts of additional yarn weights

grams/square meter	407	441	475	509	542	576	610	644	678	712	746	780	814	848	881	915	949
ounces/square yard	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Abiotic Depletion (kg)	4.0E-05	4.3E-05	4.5E-05	4.7E-05	4.9E-05	5.1E-05	5.3E-05	5.5E-05	5.7E-05	5.9E-05	6.1E-05	6.4E-05	6.6E-05	6.8E-05	7.0E-05	7.2E-05	7.4E-05
Acidification (kg)	0.042	0.043	0.045	0.046	0.048	0.049	0.051	0.052	0.054	0.055	0.056	0.058	0.060	0.061	0.062	0.064	0.065
Eutrophication (kg)	0.005	0.005	0.006	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.008	0.009	0.009	0.009
Global Warming (kg)	9.80	10.16	10.53	10.90	11.26	11.63	12.00	12.36	12.73	13.10	13.47	13.84	14.25	14.57	14.93	15.30	15.67
Ozone Depletion (kg)	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1E-06	1E-06	1E-06	1.0E-06	1.0E-06	1E-06	1E-06
Smog (kg)	0.0058	0.0060	0.0061	0.0062	0.0063	0.0064	0.0066	0.0067	0.0068	0.0069	0.0070	0.0071	0.0073	0.0074	0.0075	0.0076	0.0077
Primary Energy (MJ)	176.71	181.67	186.64	191.60	196.41	201.38	206.34	211.30	216.26	221.22	226.19	231.15	236.69	241.07	245.89	250.85	255.81
Nonrenewable Resource (kg)	4.78	4.91	5.03	5.15	5.28	5.40	5.52	5.65	5.77	5.90	6.02	6.15	6.29	6.40	6.52	6.64	6.77
Water Consumption (m3)	0.657	0.684	0.711	0.738	0.764	0.792	0.819	0.846	0.873	0.900	0.927	0.954	0.985	1.008	1.035	1.062	1.089
Non hazardous Wastes (kg)	4.58	4.71	4.84	4.97	5.10	5.23	5.36	5.49	5.62	5.75	5.88	6.01	6.16	6.27	6.40	6.53	6.66
Hazardous Wastes (kg)	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.055	0.055
Radioactive Wastes (kg)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Interpretation

The majority of the environmental impacts occur during the extraction of raw materials and processing included in the Production Stage (93% of total Global Warming Potential). The life cycle impacts of Nylon 6 are the largest contributor to the Manufacturing Stage. The Nylon 6 yarn in these products contributes over 57% of the Production Stage GWP. The other major contributor to GWP is the GlasBac® backing which accounts for 23%. Because no wet dyeing

processes are used in solution dyed yarn, the processing energy in the Manufacturing Stage is low, contributing only % of the total GWP.

The LCA included installation by TacTiles®, but the impacts would be higher if traditional adhesive method was used. Installation has minimal impact due to the modular nature of carpet tile and the innovative installation method, TacTiles®. Modular carpet tile allows for lower installation waste (2%) as compared to the waste in a broadloom installation. Modular carpet also eliminates the need for cushion underlayment, another contributor to waste and impact in broadloom carpet installations. The TacTile® installation method uses small connectors which attach the carpet tiles to each other, creating a floating floor. This eliminates the need for spread adhesive and all of the wastes and VOC emissions associated with wet adhesive application. In addition to ease of installation, the TacTile® technology also supports recycling making carpet removal easier and resulting in returned carpet clean of adhesives improving recyclability.

The Use Stage is represented in this report for one year of maintenance. The contribution to the life cycle impact is small because carpet requires only regular vacuuming and intermittent extraction cleaning.

End of Life Stage for these products is landfill and it accounts for 2% of the GWP, but every effort is made to insure the product is returned to Interface for recycling. The ReEntry® 2.0 carpet reclamation program is an extensive reclamation and recycling program that recovers both yarns and backings from post consumer and post industrial carpet.

Interface and its stakeholders share a common concern for the environment with particular interest in mitigating climate change through the elimination of product-related emissions. They have addressed this concern by creating climate neutral products. The total GHG emissions created during the life cycle of the products (raw material acquisition, manufacturing, transportation, 7 year use and maintenance, and end-of-life disposition) are modeled using Life Cycle Assessment methodology. These emissions are then neutralized through the purchase and retirement of an equivalent number of verified emission reduction credits. As a result of this program, the GlasBac® N6 products represented by this EPD can be made climate neutral by customer request. This program is verified by SGS. (http://www.climatechange.sgs.com/home_climatechange_v2/voluntary_activites/cool_carpet_a_climate_neutral_option.htm)

Interface®

Interface Asia Pacific
Manufactured in Thailand
Modular Carpet on GlasBac®
Nylon 6 Styles

According to ISO 14025

Additional Information, Evidence, and Test Results

Emissions

Low VOC emissions are documented by CRI Green Label Plus certification through testing at Air Quality Sciences, test report # 2237.

References

ASTM E-648. Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source. http://www.astm.org/Standards/E648.htm

ASTM E-662. Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials. http://www.astm.org/Standards/E662.htm

BS 6307/ISO 6925 (1982). Method for determination of the effects of a small source of ignition on textile floor coverings (methenamine tablet test)

BS EN 985 (2001). Textile floor coverings. Castor chair test

BS ISO 10361 (2000). Textile floor coverings -- Production of changes in appearance by means of Vettermann drum and hexapod tumbler testers

BS ISO 6356 (2000) Textile floor coverings -- Assessment of static electrical propensity -- Walking test

Carpet & Rug Institute. Commercial Customers Cleaning and Maintenance. http://www.carpet-rug.org/commercial-customers/cleaning-and-maintenance/

Carpet & Rug Institute. Commercial Customers Green Label / Green Label Plus. http://www.carpet-

rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/

Carpet & Rug Institute. Commercial Customers Selecting the Right Carpet. http://www.carpet-rug.org/commercial-customers/selecting-the-right-carpet/

Carpet & Rug Institute. CRI Test Method 101. http://www.carpet-rug.org/technial_bulletins/0307_ CRI_TM_101.pdf

Carpet & Rug Institute. Residential Customers Green Label / Green Label Plus. http://www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm

EN 1307 (2008). Textile floor coverings. Classification of pile carpets

European Commission Joint Research Center (2008). LCA Tools, Services and Data. http://lca.jrc.ec.europa.eu/lcainfohub/index.vm

GaBi 6 (2013). Software-System and Databases for Life Cycle Engineering Copyright, TM. Stuttgart, Echterdingen

IBU Institut für Bauen und Umwelt (2008). PCR - Floor Coverings, Environmental Product Declarations Harmonised Rules for Textile, Laminate and Resilient Floor Coverings. www.bau-umwelt.de

ISO 14025 (2006). Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 14040 (2006). Environmental management - Life cycle assessment – Principles and framework

ISO 14044 (2006). Environmental management - Life cycle assessment – Requirements and guidelines

ISO 9239-1 (2002). Reaction to fire tests for floorings -- Part 1: Determination of the burning behaviour using a radiant heat source.