Environmental Product Declaration

In accordance with ISO 14025 for:

Thermo-Plastic Elastomer (TPE) from

SIBUR Holding

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-02300
Publication date:	2023-08-01
Valid until:	2028-07-31

Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Product category rules (PCR): Plastics in primary forms, 2010:16, version 3.01, UN CPC 347
PCR review was conducted by: Technical Committee of the International EPD System
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Dr Hüdai Kara, Metsims Sustainability Consulting (www.metsims.com) **Approved by:** The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

Company information

Owner of the EPD:
SIBUR Holding 16/1 Krzhizhanovskogo St., Moscow, 117218
Phone: +7 (495) 777-55-00; +7 (495) 780-55-00
Fax: +7 (495) 777-55-00
E-mail: info@sibur.ru

Description of the organisation:
JSC Voronezhsintezkauchuk (VSK) is a subsidiary of the SIBUR petrochemical group and a largest domestic producer of high-quality synthetic rubbers and SBS polymers (thermoplastic elastomers).

Web-site: https://www.sibur.ru/voronejkauchuk/

Name and location of production site:
JSC Voronezhsintezkauchuk
394014, Russia, Voronezh, Leninskiy Avenue, 2
Phone: +7 (473) 220-67-09
Fax: +7 (473) 220-68-69
E-mail: VSK-office@vsk.sibur.ru

Product-related or management system-related certifications:
The SIBUR Integrated Management System complies with the requirements of the following international standards:
ISO 9001 "Quality Management Systems"
ISO 45001 "Occupational health and safety management systems"
ISO 14001 Environmental Management Systems.
For more information see http://www.sibur.ru/ru/sustainability/integrated-management-system/

Product information

Product name:
Thermoplastic elastomer

Product identification:
Butadiene styrene thermoplastic elastomers are produced are produced in accordance with the next Specifications (RU):

- 2294-021-00148889-2014
- 2294-022-00148889-2014
- 2294-018-00148889-2013
- 2294-019-00148889-2013

Product description:
Butadiene styrene thermoplastic elastomers are the product of styrene and butadiene block copolymerization in hydrocarbon solution in the presence of lithium organic catalyst. Content of bound styrene is 30 ± 1.5% wt. It is powdered with calcium stearate or silicon dioxide. Stabilized with non-darkening antioxidants. The release form is both powder and granules.

Butadiene styrene block copolymers retain elasticity at low temperatures, do not require vulcanization, at normal temperatures has the properties of vulcanized rubbers, soluble in aromatic, cycloaliphatic and aliphatic solvents.

UN CPC code: 347
Geographical scope: Russia

LCA information

Functional unit / declared unit:

The functional unit used for the EPD is one tonne (1 t) of thermoplastic elastomer in granule

Reference service life:

Guaranteed safe storage life of the product: 1 (one) year from date of manufacture. Further information on the products can be found on the manufacturer's website[1].

Time representativeness:

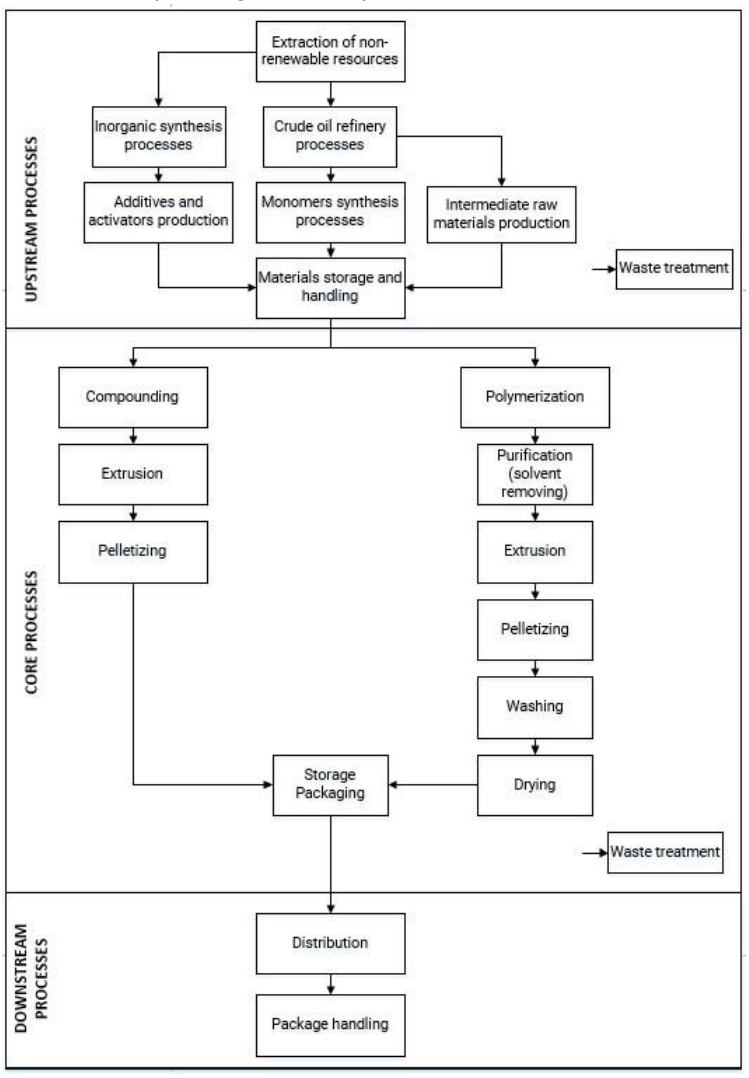
Primary data were collected from the manufacturer for 2021.

Database(s) and LCA software used:

GaBi Software version 10.0.1.92 was used to model the life cycle of TPE
Secondary data from GaBi Database content version 2022.1 was used to perform LCA modelling.
Individual datasets from Environmental Footprint Database v. 2.0 were also taken

System diagram:

Processes included in the corresponding LCA are presented in a scheme bellow.



[1] https://www.sibur.ru/voronejkauchuk/products/

Description of system boundaries:
System boundaries covered by the EPD is “from cradle-to-grave” according to the corresponding PCR.

Estimates and Assumptions:
The mass of flows excluded from the LCA does not exceed 5% of the total mass of the corresponding product system and 1% of the mass of the flows of the main production process. The contribution to the environmental impact of the excluded flows does not exceed 1% of the total life cycle impact of the TPE. Allocation in Core processes was avoided by system expansion. Allocation by mass was applied where it was necessary.

More information:
More information about the company and products could be found on the EPD’s holder web-site - https://www.sibur.ru/ru/

LCA and the EPD prepared by CIS Center LCA team – Dmitrii Vadivasov, Olga Reshetar.
CIS Center web-site: https://www.ciscenter.org/

Content declaration

Product

Materials / chemical substances	[Unit]	%	Environmental / hazardous properties
Styrene copolymer with 1,3-butadiene	kg	94.1-99.3	None*
Additives (adhesion reducing powder + antioxidant)	kg	0.56-1.1	None*

*Products under the scope of the EPD do not contain restricted substances designated in Annex XVII of REACH Regulation; Substances designated in REACH candidate list; Substances listed in Annex XIV of REACH Regulation.

Packaging

Distribution packaging:

Delivery of the finished product is carried out in big-bag or small volume bags. Wooden pallets, stretch film, strapping and labels can also be used.

Environmental performance

Potential environmental impact

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Global warming potential (GWP)	Fossil	kg CO_2 eq.	3.58E+03	2.08E+03	1.15E+02	5.77E+03
	Biogenic	kg CO_2 eq.	2.41E+01	1.01E+01	6.43E+00	4.06E+01
	Land use and land transformation	kg CO_2 eq.	9.95E-02	4.35E-01	7.76E-01	1.31E+00
	TOTAL	kg CO_2 eq.	3.61E+03	2.09E+03	1.22E+02	5.82E+03
Ozone layer depletion (ODP)		kg CFC 11 eq.	2.86E-08	4.75E-11	1.13E-11	1.07E-09
Acidification potential (AP)		kg mol H^+ eq.	6.49E+00	1.88E+00	1.29E-01	8.49E+00
Eutrophication potential (EP)		kg PO_4^{3-} eq.	8.22E-01	1.54E-01	1.93E-02	9.95E-01
Photochemical oxidant creation potential (POCP)		kg NMVOC eq.	7.24E+00	2.30E+00	1.11E-01	9.64E+00
Abiotic depletion potential (ADP)	Metals and minerals	kg Sb eq.	1.32-02	5.51E-05	1.16E-05	3.16E-04
	Fossil resources	MJ, net calorific value	7.83E+04	1.58E+04	1.49E+03	9.56E+04
Water deprivation potential (WDP)		m^3 world eq.	2.63E+03	1.05E+04	7.69E+01	1.32E+04

Use of resources

PARAMETER		UNIT	Upstream	Core	Downstream	TOTAL
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	6.39E+02	4.28E+02	1.05E+02	1.17E+03
	Used as raw materials	MJ, net calorific value	0.00E+00	0.00E+00	1.00E+00	1.00E+00
	TOTAL	MJ, net calorific value	6.39E+02	4.28E+02	1.06E+02	1.17E+03
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	7.90E+04	1.84E+04	1.52E+03	9.89E+04
	Used as raw materials	MJ, net calorific value	1.15E+05	0.00E+00	0.00E+00	1.15E+05
	TOTAL	MJ, net calorific value	1.94E+05	1.84E+04	1.52E+03	2.14E+05
Secondary material		kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuels		MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water		m3	3.33E+02	8.66E+02	6.32E+00	1.21E+03

Waste production

Waste production

PARAMETER	UNIT	Upstream	Core	Downstream	TOTAL
Hazardous waste disposed	kg	4.21E-04	2.64E-06	0.00E+00	4.24E-04
Non-hazardous waste disposed	kg	1.37E+01	4.94E+00	0.00E+00	1.86E+01
Radioactive waste disposed	kg	1.12E-01	2.91E-01	0.00E+00	4.04E-01

References

General Programme Instructions of the International EPD® System. Version 3.0.
PCR 2010:16. Plastics in primary forms. 3.01
ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures, International Organization for Standardization (ISO)
ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework, International Organization for Standardization (ISO)
ISO 14044:2017 Environmental management – Life cycle assessment – Requirements and guidelines, International Organization for Standardization (ISO)

EPD®

www.environdec.com