

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name	Perpetual Carbon / Torrefied wood pellets (in volume $\leq 3\text{m}^3$)
Product code	PCN205S, PCN210S, PCN230S, PCC230T, PCR230T, PCP210T, PCP230T, PCB210T, PCB230T
Unique Formula Identifier (UFI)	None assigned

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	Perpetual Carbon is a renewable carbon-based product which can be used as a combustible fuel as a replacement for fossil coal, or a renewable additive or as a reduction or coking coal replacement. This product is, especially in the form of pellets, an energy-dense carrier with similar properties to that of fossil coal. It is made from forestry and agricultural residues which are thermally treated in an oxygen deficient environment.
Uses advised against	Not for human or animal consumption.

1.3 Details of the supplier of the safety data sheet

Company Identification	Perpetual Next 1033 SE Amsterdam The Netherlands
Telephone	+31 20 308 5910 (Netherlands)
E-mail (competent person)	kolelas@cegeneration.com (UK Derby site) argo.tonuri@baltania.ee (Estonia, Baltania site) h.schimmel@perpetualnext.com (Netherlands, Perpetual Next)

1.4 Emergency telephone number

Emergency Phone No.	+44 1332 767340 (Derby site); Derby site office hours: 7am - 4pm +372 508 0144 (Baltania site) Baltania site office hours: 8am - 5pm
Languages spoken	English (UK Derby site) English and Estonian (Estonia Baltania site) Dutch and English (Amsterdam site)


MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 2: HAZARDS IDENTIFICATION

2.1	Classification of the substance or mixture	Eye Irrit. 2; H319 STOT SE 3; H335
2.1.1	Regulation (EC) No. 1272/2008 (CLP)	
2.2	Label elements	According to Regulation (EC) No. 1272/2008 (CLP)
	Product name	Perpetual Carbon / Torrefied wood pellets
	Contains:	Carbon
	Hazard Pictogram(s)	
	Signal Word(s)	WARNING
	Hazard Statement(s)	H319: Causes serious eye irritation. H335: May cause respiratory irritation.
	Precautionary Statement(s)	P261: Avoid breathing dust. P280: Wear protective gloves/protective clothing/eye protection/face protection. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312: Call a POISON CENTER/doctor if you feel unwell. P337+P313: If eye irritation persists: Get medical advice/attention.
	Supplemental information	Not applicable
2.3	Other hazards	Flammable product used as a fuel. Flames and smoke may not always be generated as a sign of combustion. May form combustible or explosive dust concentrations in air. Handling of this material may generate a dust which can cause mechanical irritation of the eyes, skin nose and throat. Self-heating may occur if product is transported in bulk (volume > 3m ³) or stored in non-airtight packagings and exposed to air flow.

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances Not applicable

3.2 Mixtures

EC Classification Regulation (EC) No. 1272/2008 (CLP)

Chemical identity of the substance	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard classification
Carbon	< 65	7440-44-0	231-153-3	Not yet assigned in the supply chain	Eye Irrit. 2; H319 STOT SE 3; H335

For full text of H phrases see section 16.

SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Self-protection of the first aider	Obtain special instructions before use. No action should be taken involving personal risk. Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid breathing dust. Avoid contact with skin and eyes.
Inhalation	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention immediately.
Skin contact	IF ON SKIN: Gently wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Remove contaminated clothing and wash clothing before reuse. If irritation develops and persists, get medical attention.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention. Seek medical attention if irritation persists.
Ingestion	IF SWALLOWED: Rinse mouth. Give plenty of water to drink. Do NOT induce vomiting. Seek medical treatment.

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



4.2 Most important symptoms and effects, both acute and delayed	Causes serious eye irritation. May cause respiratory irritation.
4.3 Indication of any immediate medical attention and special treatment needed	Treat symptomatically

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media	
Suitable extinguishing media	As appropriate for surrounding fire. Use water, CO ₂ , dry chemical, or foam.
Unsuitable extinguishing media	None known
5.2 Special hazards arising from the substance or mixture	Combustion of this product is unlikely to produce a flame, the product will smoulder and combust at high temperature in certain circumstances without visible smoke or flames. Product may re-ignite after fire is extinguished. Explosion: May form combustible or explosive dust concentrations in air. Avoid dust generation. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Combustion products: Carbon monoxide, Carbon dioxide.
5.3 Advice for firefighters	Beware of flameless combustion, beware of carbon monoxide. Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers. Use of water to prevent generation of dust clouds.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures	Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. No action should be taken involving personal risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Wear appropriate personal protective equipment, avoid direct contact. Avoid breathing dust. Ensure adequate ventilation. Remove contaminated clothing and wash all affected areas with plenty of water. Avoid dust generation. Maintain air gap between stacks or pallets. Dust deposits should not be allowed to accumulate on surfaces, as these may form a flammable or explosive mixture if they are released into the atmosphere in sufficient concentration.
6.2 Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or water courses.
6.3 Methods and material for containment and cleaning up	Provided it is safe to do so, isolate the source of the leak. Sweep spilled substances into containers if appropriate

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



moisten first to prevent dusting. Use non-sparking equipment when picking up flammable spill. Collect mechanically and dispose of according to Section 13. Use non-sparking tools. Ventilate the area and wash spill site after material pick-up is complete.

6.4 Reference to other sections See Section: 8, 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling Flammable product. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposures. Do not eat, drink or smoke when using this product. Remove contaminated clothing and wash clothing before reuse. Maintain air gap between stacks or pallets when applicable.

7.2 Conditions for safe storage, including any incompatibilities Keep only in original packaging. Self-heating may occur if product is stored in non-airtight packaging. Do not expose product to air flow. Ensure adequate ventilation in storage room. Keep container closed if applicable. Keep away from moisture. Oxygen depletion and carbon monoxide emission can occur when material is stored in a confined space. Ensure oxygen and carbon monoxide monitors are worn and activated when entering storage room. Access routes for fire-fighting must be free.

Storage temperature Store in a cool/low-temperature, dry place away from heat and ignition sources.

Incompatible materials Keep away from oils, acids and strong oxidising agents.

7.3 Specific end use(s) See Section: 1.2.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limits The UK HSE (EH40) recommends the following limits for dusts: 10 mg/m³ (8hr TWA) total inhalable dust; 4 mg/m³ (8hr TWA) total respirable dust.

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Vinyl acetate	108-05-4	5	17.6	10	35.2	IOELV, WEL
2,6-Di-tert-butyl-p-cresol	128-37-0	-	10	-	-	WEL




Source: Workplace Exposure Limit (UK HSE EH40), IOELV: Indicative Occupational Exposure Limit Value

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



8.1.2 Biological limit value	Not established.
8.1.3 PNECs and DNELs	Not established.
8.2 Exposure controls	
8.2.1 Appropriate engineering controls	Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Avoid breathing dust. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Maintain air gap between stacks or pallets. Keep cool.
8.2.2 Individual protection measures, such as personal protective equipment	Keep good industrial hygiene. Wear appropriate personal protective equipment, avoid direct contact. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke at the work place. Avoid breathing dust.
Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.	
Eye/ face protection 	Wear eye protection with side protection (EN166). Eyewash bottles should be available.
Skin protection 	Hand protection: Recommend wearing of impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Protective index 6, corresponding > 480 minutes of permeation time according to EN 374. Suitable material: Nitrile rubber Body protection: Wear dust-resistant protective clothing.
Respiratory protection 	Not normally required. Wear suitable respiratory protective equipment if processing involves working in areas where significant concentrations of dusts or vapours are likely to be evolved. In case of inadequate ventilation wear respiratory protection.
Thermal hazards	Not applicable.
8.2.3 Environmental exposure controls	Avoid release to the environment

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties	
Physical state	Pellets
Colour	Dark brown to black
Odour	None / Woody / Smoky
Melting point/freezing point	No data available
Boiling point or initial boiling point and boiling range	No data available
Flammability (solid, gas)	Explosion: Dust from pellets may form combustible or explosive dust concentrations in air.
Upper/lower flammability or explosive limits	Maximum explosion pressure (Pmax) = 9.6 bar Coefficient of pressure rise (Kst) = 179 bar.m.s-1 Maximum Rate of Pressure Rise (dP/dt)max = 658 - 660 bar.s-1 St Class =1 Layer ignition temperature = 270°C LIT Value (270°C), minus 75°C Safety Factor = 195 °C MIT Value (440 - 460°C), minus 1/3 Safety Factor = 293 - 307 °C Capacitive & Inductive MIE = in the range of 20 - 25 mJ and 80 - 100 mJ
Flash point	No data available
Auto-ignition temperature	Self heating classification not applicable if transported in volume of no more than three cubic meters. Product is being transported and stored in volume of $\leq 3\text{m}^3$. Product may generate self heating combustion if transported in bulk (volume $> 3\text{m}^3$) or stored in non-airtight packagings and exposed to air flow.
Decomposition Temperature	No data available
pH	No data available
Kinematic viscosity	No data available
Solubility	No data available
Partition coefficient: n-octanol / water (log value)	No data available
Vapour pressure	No data available
Density and/or relative density	No data available
Relative vapour density	No data available
Particle characteristics	No data available

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



9.2 Other information	
Evaporation rate	No data available
Explosive properties	Dust from pellets may form combustible or explosive dust concentrations in air.
Oxidising properties	Not oxidising
Moisture content	≤ 10%
Particle size	Pellet Diameter: 6 mm, Pellet Length: up to c.30 mm
Loss on Drying	No data available
Form	Round cylindrical pellets
Colour	Brown to black
Net CV Dry	20 – 23 MJ/kg
Bulk Density	500 – 650 kg/m ³
Mechanical durability	90 – 99%
Minimum Explosive Concentration	40 – 50 g/m ³

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity	Stable under normal conditions.
10.2 Chemical stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	Self heating possible when transported in bulk (volume > 3m ³) or stored in non-airtight packagings and exposed to air flow. Hazardous polymerisation will not occur. May form combustible or explosive dust concentrations in air. May generate concentrations of CO in bulk.
10.4 Conditions to avoid	Keep away from ignition sources, excess airflow, heat and moisture. Avoid dust formation.
10.5 Incompatible materials	Keep away from: acids and strong oxidising agents.
10.6 Hazardous decomposition products	Combustion products: Carbon monoxide, Carbon dioxide.

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 11: TOXICOLOGICAL INFORMATION

11.1	Information on toxicological effects	
	Acute Toxicity - Ingestion	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
	Acute Toxicity - Inhalation	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) > 5 mg/L (Dust)
	Acute Toxicity - Skin contact	Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg.
	Skin corrosion/irritation	Mixture: Based upon the available data, the classification criteria are not met.
	Serious eye damage/irritation	Mixture: Eye Irrit. 2; H319: Causes serious eye irritation.
	Carbon	Eye Irrit. 2; H319: Causes serious eye irritation. EU classification and labelling inventory
	Respiratory or skin sensitisation	Mixture: Based upon the available data, the classification criteria are not met.
	Germ cell mutagenicity	Mixture: Based upon the available data, the classification criteria are not met.
	Carcinogenicity	Mixture: Based upon the available data, the classification criteria are not met.
	Reproductive toxicity	Mixture: Based upon the available data, the classification criteria are not met.
	STOT - single exposure	Mixture: STOT SE 3; H335: May cause respiratory irritation.
	Carbon	STOT SE 3; H335: May cause respiratory irritation. EU classification and labelling inventory
	STOT - repeated exposure	Mixture: Based upon the available data, the classification criteria are not met.
	Aspiration hazard	Mixture: Based upon the available data, the classification criteria are not met.
11.2	Information on other hazards	
11.2.1	Endocrine disrupting properties	Not applicable
11.2.2	Other information	None known

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity	Mixture: Based upon the available data, the classification criteria are not met. Estimated LC50 (Mixture): >100mg/l
12.2 Persistence and degradability	No data for mixture as a whole.
Carbon	No data
12.3 Bioaccumulative potential	No data for the mixture as a whole.
Carbon	No data
12.4 Mobility in soil	Stability expected, no data for the mixture as a whole.
Carbon	No data
12.5 Results of PBT and vPvB assessment	None of the substances in this product fulfil the criteria for being regarded as a PBT or vPvB substance.
12.6 Endocrine disrupting properties	Not applicable
12.7 Other adverse effects	None known

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods	While generally a benign and stable material do not allow to enter drains, sewers or watercourses. Disposal should be in accordance with local, state or national legislation.
13.2 Additional information	Avoid release to the environment.

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA/ICAO
14.1 UN number or ID number	None assigned. UN 1361 (only if transported in volume greater than 3m ³)	None assigned. UN 1361 (only if transported in volume greater than 3m ³)	None assigned. UN 1361 (only if transported in volume greater than 3m ³)
14.2 UN proper shipping name	None assigned. CARBON, animal or vegetable origin (only if transported in volume greater than 3m ³)	None assigned. CARBON, animal or vegetable origin (only if transported in volume greater than 3m ³)	None assigned. CARBON, animal or vegetable origin (only if transported in volume greater than 3m ³)
14.3 Transport hazard class(es)	None assigned. 4.2 (only if transported in volume greater than 3m ³)	None assigned. 4.2 (only if transported in volume greater than 3m ³).	None assigned. 4.2 (only if transported in volume greater than 3m ³)
14.4 Packing group	None assigned. III (only if transported in volume greater than 3m ³).	None assigned. III (only if transported in volume greater than 3m ³)	None assigned. III (only if transported in volume greater than 3m ³)
14.5 Environmental hazards	Not classified	Not classified as a Marine Pollutant.	Not classified
14.6 Special precautions for user	See Section: 2 In cases where product bags are damaged during transport, the material must be re-packed in packagings with volume less than 3m ³ because of the possible self-heating hazard arising from volume greater than 3m ³ .		
14.7 Maritime transport in bulk according to IMO instruments	Not applicable	Not applicable	Not applicable
14.8 Additional Information	None known	None known	None known

IMSBC Code 2018 Edition - Wood torrefied page 386 - 387

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1 EU regulations	
Authorisations and/or restrictions on use	Not restricted
15.1.2 National regulations	
Germany	Water hazard class: NWG (Self classification)
15.2 Chemical Safety Assessment	According to the REACH SIEF Final Report Phase 1, the product is exempt from REACH Registration

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable

References:

Bulk reference Product_MSDS_PERPETUAL CARBON pellet-bulk PCX205-230 EN_V1.0 2 SEP 2021

Previous version Material Safety Data Sheet – Biocoal Pellets MSDS v7 14122020

EU classification and labelling inventory for Carbon (CAS No. 7440-44-0)

Test Result: Biocoal - Thermal stability testing; Report issue date - 17th March 2020; Report number – S3016005479R1/2020

Test Result: Biocoal Pellets – Ignition Sensitivity, Explosion Severity & Thermal Stability Testing; Report issue date – 2nd April 2020; Report number – S3016007148BR1/2020

IMSBC Code 2018 Edition – Wood torrefied page 386 – 387

REACH SIEF Final Report Phase 1

MATERIAL SAFETY DATA SHEET

Version: 1.0 Date: 30 NOVEMBER 2021

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



EU Classification:

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP)	Classification procedure
Eye Irrit. 2; H319	Threshold Calculation
STOT SE 3; H335	Threshold Calculation

Legend

ADR	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Chemical Abstracts Service
DNEL	Derived No Effect Level
EC	European Community
EN	European Standard
EU	European Union
IATA	International Air Transport Association
ICAO/IATA	ICAO: International Civil Aviation Organization/IATA: International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration 50
LD50	Lethal dose 50
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
TWA	Time Weighted Average
UN	United Nations
vPvB	Very Persistent and very Bioaccumulative
WGK	Wassergefährdungsklasse (Germany) / Water hazard class

Hazard classification / Classification code:	Hazard Statement(s)
Eye Irrit. 2; Eye Irritation, Category 2	H319: Causes serious eye irritation.
STOT SE 3; Specific target organ toxicity — single exposure, Category 3	H335: May cause respiratory irritation.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Disclaimers

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Perpetual Next gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Perpetual Next accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Annex to the extended Safety Data Sheet (eSDS)

Exposure Scenarios are not applicable