1. Identification of the substance/preparation and of the company/undertaking

1.1. Product identifier

Product name: AFA 4-dot S
Extruded Activated Carbon, High Density Skeleton
Thermal water steam activated carbon with a sugar based binder

Additional identification: EC Number: 931-328-0
CAS Number: 7440-44-0
REACH Registration No: 01-2119488894-16-0018

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

Recommended uses
Use as an adsorbent in industrial, professional and consumer setting.

Uses advised against
Currently no uses advised against have been identified.

1.3. Details of the supplier of the safety data

AdFiS products GmbH
Am Kellerholz 14
D-17166 Teterow
Germany
Tel: 0049 (03996) 1597-0
Fax: 0049 (03996) 1597-99
info@adfis.de

1.4. Emergency telephone number

0049 (03996) 1597-0

2. Hazards identification

2.1. Classification of the substance or mixture

- Not classified according to Regulation (EC) No 1272/2008 (CLP).
- Not classified as dangerous according to Directives 67/548/EEC or 1999/45/EC.

Additional information

- No additional information is available.

Information pertaining to special dangers for human and environment

- No special dangers have been identified.

2.2. Label elements

- As the substance is not classified as hazardous no hazard label is required.

2.3. Other hazards

- As Extruded Activated Carbon – High Density Skeleton (HDS) is to be considered as an inorganic substance, the PBT assessment is not applicable.

Heating, strong heating, ignition sources and contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. This material may be self-heating under certain conditions (for example at high humidity). The uptake of humidity promotes the self-heating tendency. Big bags with activated carbon do not place on a wet underlay.

Spent (or used) activated carbons may exhibit properties pertaining to the adsorbents.

3. Composition / Information in ingredients

3.1. Substance related information

Extruded Activated Carbon, High Density Skeleton
A porous, amorphous, high surface area adsorbent material composed of largely elemental carbon, with a high-density skeleton.
CAS No: 7440-44-0
EC No: 931-328-0
REACH Registration No: 01-211948884-16-0018

4. First aid measures

4.1. Description of first aid measures

General information

- As non-powdered activated carbon has a low dustiness it poses very little hazard in an accidental workplace exposure. The first aid information below is based on contact with powdered activated carbon.

In case of inhalation

- Remove to fresh air. Obtain medical attention if cough or respiratory symptoms develop.

In case of skin contact

- Remove contaminated clothes; rinse the skin with water and soap. Obtain medical attention if irritation becomes apparent.

In case of eye contact

- Immediately flush with copious amounts of water (remove contact lenses, provide, that it can be done easily). Obtain medical attention if irritation becomes apparent.

In case of ingestion

- Wash mouth and give at least half a liter of water to drink. Obtain medical attention if gastrointestinal symptoms develop.

Self-protection of the first aider

- Ensure self-protection before entering any hazardous environment.

4.2. Most important symptoms and effects, both accute and delayed

- When large amounts are ingested orally, congestion may occur. Contact with eye, skin or mucous membranes may cause irritation.

4.3. Indication of any immediate medical attention and special treatment needed

- Not applicable.

5. Fire-Fighting measures

5.1. Extinguishing media

Suitable extinguishing media

- Spray-jet of water, water fog, powder extinguisher, carbon dioxide or foam

Extinguishing media which must not be used for safety reasons

- None

5.2. Special hazards arising from the substance or mixture

- Avoid stirring up dust clouds.
- Wetted activated carbon may cause oxygen depletion in enclosed spaces.
- Dangerous decomposition products: carbon monoxide. Used activated carbon may produce other combustion products.
- After a fire, smoldering hotspots within the activated carbon may be present for a long time.
- Activated carbon which has been allowed to smolder for a long time in a confined space may accumulate carbon monoxide above its lower explosion limit.

5.3. Advice for firefighters

Personal protective equipment for firefighters

- Standard firefighters personal protective equipment including self-containing breathing apparatus for all indoor fires and large outdoor fires.

Further advise for firefighters

- If possible move smoldering activated carbon to a safe area (preferably outside).

6. Accidental Release Measures

6.1. Personal precautions and emergency procedures

No personal precautions required for virgin activated carbon. Please refer to heading 8 for details on personal protection.

6.2. Environmental precautions
Avoid discharge to drains and contamination of water sources.

6.3. Methods and materials for containment and cleaning up
Vacuum spilled product and flush remaining product with plenty of water. Avoid stirring up, avoid dust formation.

6.4. Other information
Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.
Used or spend activated carbon may contain pollutants which require the material to be treated according to national law or local permits and which require the use of risk management measures when handling the materials.

7. Handling and Storage

7.1. Precautions for safe handling

Protective measures:
- Appropriate protective equipment should be worn. (See section 8)

Technical measures:
- Measures to prevent dust generation: Apply good working practices and engineering procedures during discharge.

Measures required to protect the environment:
- Ensure containment and adequate ventilation.

Specific requirements or handling rules:
- Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.

Precautions against fire and explosion:
- Avoid stirring up dust clouds and accumulation of dust on exposed surface. Keep activated carbon away from ignition sources.

Further information:
- Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures and storage conditions:
- Do not store at high temperatures or in direct sunlight.

Packaging materials:
- Store in original packaging

Hints on storage assembly:
- Keep away from strong oxidizers (e.g. ozone, liquid oxygen, chlorine, permanganate etc.) and strong acids. Keep away from heat sources.

Requirements for storage rooms and vessels:
- Store in a cool, well-ventilated area remote from sources of contamination. Big bags with activated carbon do not place on a wet underlay

Storage class: -

Further information on storage conditions:
- The stored quantity of wet activated carbon should be limited. Oxygen level alarms are advisable in enclosed storage rooms containing wet activated carbon.

7.3. Specific end use(s) –

8. Exposure Controls / Personal Protection

8.1. Control Parameters

Components with occupational exposure limits or biological occupational exposure limits requiring monitoring.

Occupational exposure limits
Air limit values:

Limit value type (Country of origin)	Substance Name	Occupational exposure limit		Recommended monitoring procedures	Peak limitation	Source
		Long term (mg/m³)	Short term (mg/m³)			
Germany	Activated Carbon alveolar fraction	1.5	-	Personal air sampling for alveolar fraction	-	DFG Deutsche Forschungsgemeinschaft: MAK- und BAT-Werte Liste 2010, Senatskommission zur Prüfung gesundheits-schädlicher Arbeitsstoffe, Mitteilung 46; VCH
	Activated Carbon respirable fraction	4	-	Personal air sampling for respirable fraction	-	

Biological limit values: No biological limit value has been set.
Additional exposure limits under the conditions of use: None.

DNEL/DMEL and PNEC values

DNEL / DMEL		Exposure route	Exposure frequency	Critical component	Remark
Worker	Consumer				
3 mg/m³	0.5 mg/m³	inhalation	Short term (acute) Long term (repeated)	Activated Carbon	The interim inhalation DNEL long-term exposure for local effects was based on the OEL (TWA, 8 hr) set by the American Conference of Governmental Industrial Hygienists (ACGIH, 2001) for inhalable dust of carbon black. The OEL is intended to minimize excessive dirtiness and effects on lung function.

No PNEC is derived as the substance is highly insoluble and no ecotoxicity information is available.

8.2. Exposure Controls

Occupational exposure controls:

- A good basic standard of occupational hygiene is to be implemented for all handling of activated carbon outside a container.

Safety controls:

- Low oxygen work procedures should be in place – Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Alternatively, the room may be fitted with oxygen level sensors having an alarm setting at 18 vol.%.

Technical measures to prevent exposure:

- For industrial and professional use of granular activated carbon and slurries of granular activated carbon no technical measures to prevent exposure are required.
- For industrial use of powdered activated carbons kept in high level containment with only occasional possibility of exposure no technical measures are required.
- For professional use of powdered activated carbons kept in high level containment with up to without the possibility of exposure no technical measures are required.
- Provide local exhaust ventilation with a minimum effectiveness of 90% for all activities

Personal protection equipment:

- When handling non-powdered or slurried activated carbon no personal protection equipment is required.
- Respiratory protection: Use a half face mask fitted with P2 filter (minimum effectiveness of 90%) or better for handling powdered activated carbon (HDS). Keep dust exposure to a minimum.
- Hand protection: No uses requiring hand protection have been specifically identified but the use of gloves is recommended as good practice.
- Eye protection: Use goggles with side protection if contact with powdered activated carbon can occur.
- Body protection: Standard protective work clothes.

8.3. Environmental exposure controls

Product related measures to prevent exposure:

- Local exhaust ventilation to remove material at source.
- Contained storage
- Regulated waste disposal

Instructional measures to prevent exposure:

- Inclusion of ISO 14001
- Appropriate documentation such as work instruction procedures

Organizational measures to prevent exposure:

- Awareness training of workforce

- Regular procedural reviews
- Environmental audits carried out by certified personnel

Technical measures to prevent exposure: -

8.4. Consumer exposure controls

- Normal use of AC - HDS in household products sold as filter products is safe under all foreseeable circumstances.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance
Physical state: Solid
Color: Black
Odor: None

Important health, safety and environmental information

Property	Value	Method	Remark
pH (20 °C)	10-12		
Melting point/range (°C)	> 1,000		The melting point of Activated Carbon - High Density Skeleton in an inert environment is estimated to be well above 1,000 °C
Boiling point/range (°C)	> 1,000		The boiling point of Activated Carbon - High Density Skeleton in an inert environment is estimated to be well above 1,000 °C
Flammability	-		
Flash point (°C)	-		
Ignition temperature (° C)	350 - 450		
Decomposition temperature	-		
Vapor pressure	-		
Skeleton Density (g/cm³)	2.10 – 2.20		
Bulk Density (kg/m³)	450 – 500		
Water solubility (g/l @ 20 °C)	0		The water solubility of Activated Carbon - High Density Skeleton was determined according to OECD guideline 105 under GLP using the column elution method. It was found that the substance is insoluble in water at pH 6.8 and a temperature of 20 °C.
Partition coefficient n-Octanol / Water (log P_{ow})	-		
Viscosity dynamic (mPa*s)	-		Substance is solid
Explosion limits for dust explosion hazard • Lower • Upper	-		

9.2. Other Information

The physical and chemical properties of the spent material may be different to that of virginal activated carbon.

10. Stability and Reactivity

10.1. Reactivity

This product shows no reactivity under the specified conditions of storage, shipment and use.

10.2. Chemical Stability

This product is stable under the specified conditions of storage, shipment and use.

10.3. Possibility of hazardous reactions
Contact with strong oxidizers, i.e., chlorine, liquid oxygen, permanganate, ozone, may result in rapid combustion/possible explosion.

10.4. Conditions to avoid
Keep operating temperatures below 70 ºC. Do not store in direct sunlight.

10.5. Incompatible materials
Keep away from strong oxidizers and strong acids.

10.6. Hazardous decomposition products
Carbon monoxide or carbon dioxide.

11. Toxicological Information

11.1. Information on toxicological effects

Acute effects (toxicity tests):

	Effect Dose	Species	Method	Remark
Oral	LD50: > 2000 mg/kg bw (female) (No treatment related effects were observed.)	Rat, female	OECD Guideline 423 (Acute Oral toxicity - Acute Toxic Class Method) EU Method B.1 tris (Acute Oral Toxicity – Acute Toxic Class Method	Reliable without restriction
Dermal	No data available	-	-	In accordance with column 2 of REACH Annex VII, an Acute toxicity study via the dermal route (required in section 8.5) does not need to be conducted since studies for Acute toxicity via the oral and inhalation route are available.
Inhalation	LC0 (1 h): 64.4 mg/L air (nominal) or 8.5 mg/L air (analytical) (male/female) (No deaths, but multiple effects were observed (contamination of fur, general stress, lung rales, weight loss, lung discoloration)) LC100 (1 h): 235 mg/L air (nominal) (All animals died (initial test))	Rat	Equivalent or similar to OECD Guideline 403 (Acute Inhalation Toxicity)	Reliable without restriction

Specific symptoms in animal studies:

- In case of ingestion: -
- In case of skin contact: -
- In case of inhalation:
  - Body weight loss, respiratory mucous membrane irritancy and - at necropsy - lung discoloration were observed. The LC50 was determined to be >8.5 mg/L for the inhalation route
- In case of eye contact: -

Irritant and corrosive effects:

	Exposure time	Species	Evaluation	Method	Remark
Primary irritation to the skin	4 h	Rabbit	Not irritating	OECD Guideline 404	Reliable with restrictions
Irritation to the eyes		Rabbit	Not irritating	OECD Guideline 405 (Acute Eye Irritation / Corrosion) (2002) EU Method B.5 (Acute Toxicity: Eye Irritation /-Corrosion) (2008)	Reliable without restriction

Sensitization:

- In case of skin contact: Not sensitizing
- In case of inhalation: No information available

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):

In-vitro mutagenicity	No data available
Genotoxicity	No data available
In-vivo mutagenicity	No data available
Germ cell mutagenicity	Negative with and without metabolic activation
Toxicity for reproduction	No data available

Summarized evaluation of the CMR properties:
All 3 in vitro key studies indicate that the substance does not show any genotoxic potential. Therefore, it can be concluded that the substance is not mutagenic and therefore does not need to be classified for mutagenicity according to the criteria outlined in Annex I of 1272/2008/EC (CLP/EU-GHS) and Annex VI of 67/548/EEC.
The substance was found not to possess genotoxic properties in three in vitro genotoxicity studies (not a mutagen Cat. 3) and systemic effects (hyperplasia and/or preneoplastic lesions) were not indicated in a supporting chronic toxicity study in three species.

Specific target toxicity – single exposure:

- No information available

Specific target toxicity – repeated exposure:

- No information available

Aspiration Hazard:

- No information available

11.2. Information on other Hazards

Toxicokinetic, metabolism and distribution:

- Based on the physical and chemical properties of activated carbons, the absence of effects in toxicological studies and the therapeutic use of activated carbons as adsorbing agents for the treatment of acute poisoning and acute diarrhea, it can be expected that Activated Carbon - High Density Skeleton is not absorbed via the oral, dermal and inhalation route.

Endocrine disrupting properties:

- No Information available

12. Ecological Information

12.1. Toxicity

No information is available. As activated carbon is highly insoluble in water no toxicity is expected.

12.2. Persistence and degradability

Activated Carbon - High Density Skeleton (AC-HDS) is a solid inorganic material and not amenable to break down by any natural chemical or enzymatic processes.
AC-HDS is only broken down under extreme conditions - such as heating under reflux with concentrated sulfuric acid/nitric acid mixtures - when the carbon will eventually oxidize to CO2. AC-HDS cannot be rendered into a soluble form capable of being absorbed. Therefore AC-HDS cannot find its way to any cell site where it could conceivably be biodegraded. Moreover, testing the biodegradation is not feasible because the substance is not soluble in water.
The bioaccumulation study is waived because the substance has no log K_{ow} (substance is an inorganic substance or can be considered to behave as an inorganic substance). Also, the substance size will impede passing membranes as the substance consists of particles with sizes > 0.5 µm. The particles are not soluble in water.

12.3. Bioaccumulative potential

The substance has a very low potential to bioaccumulate in aquatic species (e.g. fish) i.e. a BCF < 10.

12.4. Mobility in soil

Known or predicted distribution to environmental compartments:

- No information available

Surface tension:

- No information available, because the material is insoluble.

Adsorption/desorption:

- Adsorption/desorption studies are technically not feasible as the substance is not soluble in water or in organic solvents; and analysis is not possible because no distinction between C of AC-HDS and C of sediment/soil can be made in the analysis. Furthermore AC-HDS consists largely of elemental carbon and is chemically inert. No further biodegradation will occur.

12.5. Results of PBT and vPvB assessment

As AC-HDS is to be considered as an inorganic substance, the PBT assessment is not applicable.

12.6. Endocrine disrupting properties

No Information available

12.7. Other adverse effects

A water slurry containing large quantities of AC-HDS carbon may display high pH values.

13. Disposal Considerations

13.1. Waste treatment methods
For virgin activated carbon no specified disposal methods apply, however, avoid discharge to drains.

13.2. Waste Codes / Waste Designations according to EWC / AVV
Waste code: 061302/ 061302*/ 150202/ 150202*/ 150203

13.3. Appropriate Packaging
-

13.4. Additional Information
Spent activated carbon may require specific disposal considerations/packaging

14. Transport Information

14.1. UN Number

ADR/RID:	-	IMDG:	-	IATA:	-

14.2. UN proper shipping name

ADR/RID:	Not dangerous goods
IMDG:	Not dangerous goods
IATA:	Not dangerous goods

14.3. Transport hazard class(es)

ADR/RID:	-	IMDG:	-	IATA:	-

14.4. Packaging group

ADR/RID:	-	IMDG:	-	IATA:	-

14.5. Environmental Hazards

ADR/RID:	no	IMDG Marine pollutant:	no	IATA:	no

14.6. Special precautions for user
Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Big Bags with activated carbon do not place on wet underlay.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC code
No Information available

15. Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
EU regulations

- Authorizations and/or restrictions on use

- Authorizations: None
- Restrictions on use: None
- Other EU regulations

15.2. Chemical Safety assessment

A Chemical safety assessment according to the rules stipulated in the REACH directive has been performed. The risk management measures based on this assessment.

16. Other Information

16.1. Relevant R- and H-statements (Number and full text)

No information available

16.2. Latest Changes in the version

Adaption to the ordinance (EU) 2020/878

- Extended by Endocrine disrupting properties (several sections)
- Extension of Section 9.1: Information on basic physical and chemical properties
- Extension of Section 14: Transport Information

16.3. Training instructions

Basic training on the hazards of the substance and the use of risk management measures is required.

16.4. Recommended restrictions on use

Avoid contact with strong oxidizing agents (and strong acids).

16.5. Use and exposure categories (overview)

Exposure	Industrial use	Professional use	Consumer use
Human, oral, short term	0	0	0
Human, oral, long term/repeated	0	0	0
Human, dermal, short term	+	+	+
Human, dermal, long term/repeated	+	+	+
Human, inhalation, short term	+	+	+
Human, inhalation, long term/repeated	+	+	+
Environment, water, short term	+	+	+
Environment, water, continuous	+	+	+
Environment, air, short term	+	+	+
Environment, air, continuous	+	+	+
Environment, soil, short term	+	+	+
Environment, soil, continuous	+	+	+

Use advised (+)
Use advised against (-)
Use not identified (0)

16.6. Further Information

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

16.7. Disclaimer

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----------END OF SAFETY DATA SHEET----------