Safety Data Sheet (SDS)

Revision 1/ Review Date: 3/15/2021

1. Chemical Product and Company Identification

Product Name:	DPG
Distributed By:	HB Chemical 1665 Enterprise Parkway Twinsburg Oh 44087 Phone - 330-920-8023
MSDS Prepared By (w Suppliers Input):	HB Chemical
Chemical Name / Family:	1,3-diphenylguanidine
CAS No.:	102-06-7
REACH:	01-2119519144-47-XXXX
Product Use:	Used as Accelerator

For emergency health, safety, and environmental information, calls 330-920-8023
For emergency transportation information, in the United States: call CHEMTREC at 800-424-9300

2. Hazard(s) Identification

Classification of the substance:
Classification according to Regulation (EC) No 1272.2008:
The following Hazard statements are applicable only to the EU regulation and not the US GHS regulation: H361f, H411
The following hazard statements are applicable only to OSHA (USA) regulation and not the specific CLP regulation: H361

H361	Suspected of damaging fertility or the unborn child
GHS08	Health Hazard
Repr 2	H361f Suspected of damaging fertility

GHS09 Environment	
Aquatic Chronic 2	H411 Toxic to aquatic life with long lasting effects

GHS07	
Acute Tox 4	H302 Harmful if swallowed
Skin Irrit 2	H315 Causes skin irritation
Eye Irrit 2	H319 Causes serious eye irritation
STOT SE 3	H335 May cause respiratory irritation

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

XN Harmful
R22-62 — Harmful if swallowed possible risk of impaired fertility.

Xi irritant
R36/37/38 — Irritating to eyes, respiratory system and skin.

N: Dangerous for the environment
R51/53 — Toxic to aquatic organisms, may cause long- term adverse effects in the aquatic environment.

Label Elements according to regulation (EC) no 1272/2008
The product is classified and labeled according to the CLP regulation.

Hazard pictograms:

Signal Words: Warning

Hazard-determining components of labeling: 1,3-diphenylguanidine
Hazard Statement:
The following Hazard Statements are applicable only to the EU regulation and not the US GHS Regulation; H361f Only:

H361f Suspected of damaging fertility. (General GHS and USA only)
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H315 Causes skin irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary Statement:

P281: Use personal protective equipment as required.
P264 Wash hands thoroughly after handling.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P271 Use only outdoors or in a well-ventilated area.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P403 + P233 Store in a well-ventilated place.

Other Hazards: Results of PBT and vPvB assessment Not applicable

3. Composition / Information on Ingredients

Substance/Mixture:			Substance
1,3-Diphenylguanidine	CAS# 102-06-7	EC# 203-002-1	96-99%

4. First Aid Measures

Description of first aid measures:	In all cases of doubt, or when symptoms persist, seek medical attention. Symptoms of poisoning may even occur after several hours therefore, medical observation for at least 48 hours after the accident.
Inhalation:	Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention. In case of unconsciousness place patient stably in side position for transportation.
Eyes:	Remove contact lenses. Hold eyelids apart. Flush immediately with water of at least 15 minutes. Seek medical attention.
Skin:	Immediately wash with water and soap and rinse thoroughly. If skin irritation continues, consult a doctor.
Ingestion:	Rinse mouth and give plenty of water to drink. Never induce vomiting in unconscious or confused persons. Call for medical help.
Most important symptoms and effects, both Acute and delayed:	Symptoms can include redness, swelling, pain and tearing. Inhalation of dust may cause respiratory tract irritation. May cause allergic skin reaction. Nausea, Cramping, Allergic Reactions and Disorientation. Hazards: Convulsion, danger of circulatory collapse, and danger of disturbed cardiac rhythm. Condition may deteriorate with alcohol consumption.
Indication of any immediate medical attention and Special treatment needed:	If swallowed, gastric irrigation with added, activated carbon. Server allergic skin reaction, bronchial spasms and anaphylactic shock are possible. Treat skin and mucous membrane with antihistamine and corticoid preparations. In cases of irritation to the lungs, initial treatment with cortical steroid inhalants. Monitor circulation, possible shock treatment If necessary oxygen respiration treatment. Later observation for pneumonia and pulmonary edema. If blue coloring appears (lips, ear-lobes, finger-nails), give oxygen treatment as quickly as possible. Medical supervision for at least 48 hours.

5. Fire-Fighting Measures

Suitable Extinguishing Media:	CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Unsuitable Extinguishing Media:	None.
Special hazards arising from the substance:	During heating or in case of fire poisonous gases are produced.
Special Fire Fighting Procedures:	Firefighters must wear fire resistant protective equipment. Wear self-contained breathing apparatus and protective gloves. Wear fully protective suit.
Special hazards arising from the substance or mixture:	Cool endangered receptacles with water spray.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	Use respiratory protective device against the effects of fumes/dust/aerosol. Ensure adequate ventilation. Wear protective equipment. Keep unprotected persons away. Avoid formation of dust.
Environmental Precautions:	Damp down dust with water spray. Avoid disposing into drainage/sewer system or directly into the aquatic environment. Keeping away from drains, surface-and ground-water and soil.
Methods for Containment and Cleaning up:	Pick up mechanically. Arrange disposal without creating dust. Keep in suitable, closed containers for disposal. Clean up affected area.
Reference to other sections:	See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for information on disposal.

7. Handling and Storage:

Precautions for safe handling

Protective measures:	Prevent formation of Dust. Do not breathe dusts/vapor. Handle in well ventilated areas. Any unavoidable deposit of dust must be regular removed. Ensure good ventilation/exhaustion at the workplace. No special precautions are necessary if used correctly.
Conditions for safe storage, including any incompatibilities:	Store closed containers in a cool, dry, well-ventilated area. Avoid storage near extreme heat, ignition sources or open flame. Do not store together with acids. Store away from foodstuffs. Store away from oxidizing agents. Store in cool, dry

	conditions in well-sealed receptacle and Keep container tightly sealed.

8. Exposure Controls / Personal Protection

Control parameters:	Occupational exposure limits: Nuisance Dust. OSHA PEL/8Hr-TWA = 15 mg/m3 (Total Dust). OSHA PEL/8-Hr TWA =05 mg/m3 (Respirable Dust). ACGIH TLV/8-Hr TWA = 10 mg/m3. White Mineral Oil OSHA PEL/8-Hr TWA = 5mg/m3 ACGIH TLV/8-Hr TWA = 5mg/m3.
Additional exposure limits under the conditions of use:	Not available.
DNEL/DMEL and PNEC-Values:	Not available.
Exposure Controls:	Avoid dust generation. Ensure good ventilation and local exhaustion of the working area.
Respiratory Protection:	Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Firefighting; use a Positive Pressure Demand Full Face Self Contained Breathing Apparatus.
Thermal Hazards:	Wear suitable protective clothing to prevent heat.
Protective Gloves:	Wear appreciates gloves to prevent skin exposure.
Eye Protection:	Wear appreciates goggles to prevent eye exposure.
Skin and Body Protection:	Wear suitable protective clothing to prevent skin exposure.
Environmental exposure controls:	Avoid discharge into the environment. This material and its container must be disposed of as hazardous waste. According to local regulations, Federal and official regulations.

9. Physical and Chemical Properties

Physical Form:	Powder; granules
Appearance & Odor:	White to off-white/Aromatic
Melting point/range (°C):	149 °c at 1013 hPa
Boiling point/range (°C) :	250 C at 1013 hPa
Flash point (°C) :	Study scientifically unjustified
Flammability (solid, gas);	Non flammable
Vapour pressure (20°C) :	0.000000004 hPa at 25C
Surface tension	58.8 mN/m at 20 C and 300 mg/L
Relative Density (25°C):	0.348 at 20 C
Water solubility (g/l) :	325 mg/L at 20C
n-Octanol/Water (log Po/w) :	Log Pow: 2.42 at 21.1 C
Dissociation constant	pKa at 20C L10.13
Viscosity	Study scientifically unjustified

Granulometry:	A study was performed at Laboratoire Qualité & Soutien Exploitation de MLPC International to investigate the particle size distribution (granulometry) on 3 batches of the test substance EKALAND DPG PD (1,3-diphenylguanidine). The study was conducted according to ISO 13320- 1 "International standard for Laser Diffraction Measurements – Principles of Laser diffraction" and in accordance with OECD Test Guideline 110. The mean particle size, number in volume, of DPG PD test item, is determined to be 26µm, with 10% of particles presenting a diameter less than 10µm, and 10% of particles presenting a diameter larger than 45µm.

10. Stability and Reactivity

Stability:	Thermal decomposition/conditions to be avoided No decomposition if used and stored according the specifications.
Possibility of hazardous reactions:	As the product is supplied it is not capable of dust explosion: however, enrichment with fine dust causes risk of dust explosion. Toxic fumes may be releases if heated above the decomposition point. Reacts with strong acids. Reacts with strong oxidizing agents.
Incompatibility Materials:	No further relevant information available.
Conditions to Avoid:	Keep away from heat and direct sunlight. Temperatures above 160 C.
Hazardous decomposition products:	Carbon monoxide, carbon dioxide. Nitrogen oxides. Hydrogen Cyanide (prussic acid).

11. Toxilogical Information

Basic toxicokinetic

The absorption, distribution, metabolism and excretion of DPG was reported by Ioannou & Matthews (1984) after oral administration to male F344 rats.
A comparison of14C-DPG (the14C-labelling was done by U-labelling on the phenyl rings) tissue distribution and excretion following single oral (dose levels 1.52 - 151.5 µmol/kg) versus intravenous (dose level 15.15 µmol/kg) administration to male F344 rats, indicates that gastrointestinal absorption of DPG was near complete and that tissue distribution and excretion were not significantly affected by the route of administration.
Within 24 and 72 hours about 80 and >99% respectively of the14C activity administered orally or intravenously was excreted about equally in the urine and faeces (elimination half-life 9.6 hours). About 30% of the14C activity eliminated in the bile was subjected to entero-hepatic circulation and excreted in the urine.
Distribution and excretion of radioactivity 1 day after administration of 14C-DPG to F344 male rats.

Tissue	Percentage total dose			
	Intravenous	Oral		
	15.15 µmol/kg	1.52 µmol/kg	15.15 µmol/kg	151.5 µmol/kg
Liver	1.37 ± 0.08	1.31 ± 0.09	1.23 ± 0.11	0.92 ± 0.09
Muscle	1.18 ± 0.08	1.08 ± 0.02	1.08 ± 0.01	1.09 ± 0.08
Adipose	0.56 ± 0.07	0.62 ± 0.03	0.47 ± 0.03	0.49 ± 0.03
Skin	0.52 ± 0.07	0.40 ± 0.01	0.41 ± 0.05	0.39 ± 0.02
Blood	0.24 ± 0.01	0.27 ± 0.01	0.23 ± 0.01	0.24 ± 0.02
Total excreted				
In urine	35.50 ± 3.38	31.76 ± 2.68	29.12 ± 1.72	43.61 ± 2.83
In feces	45.67 ± 9.01	48.25 ± 4.49	45.26 ± 2.94	39.39 ± 1.84
Total[a]	81.17 ± 6.12	80.01 ± 6.24	74.38 ± 1.27	83.00 ± 2.41

[a]DPG-derived radioactivity excreted in urine and faeces in 24 hr. The remainder is still present in tissues and intestinal contents

The following table gives an overview of the relative distribution (in %14C-activity) of14C-1,3-diphenylguanidine or the metabolites(without identifying them specifically, numbered I to V)) in liver, bile, urine and faeces after single intravenous administration.

Relative amounts of DPG and DPG-metabolites present in male F344 rat liver and excreta

		DPG metabolite (%)					^{14}C-DPG (%)
Excreta or Organ[1]	Time(h)	I	II	III	IV	V	
Liver	0.75	-	12 ± 1.2	-	-	-	88 ± 5.7
	2	-	18 ± 1.9	-	-	-	82 ± 4.3
	6	-	30 ± 2.1	-	-	-	70 ± 6.0
	24	-	30 ± 3.3	60 ± 4.5	-	-	10 ± 1.1
Bile	6	2 ± 1.2	95 ± 1.7	-	-	-	3 ± 0.5
Urine	24	-	37 ± 1.6	32 ± 1.4	-	3 ± 0.8	28 ± 0.8
Faeces	24	-	-	-	2 ± 1.0	94 ± 3.5	4 ± 1.4

intravenous administration (15.15 µmol/kg)

Three or 9 oral administrations of 15.15 µmol/kg14C-1,3-diphenylguanidine/kg/day also caused no accumulation in the tissues. In the liver there was a proportional14C increase, the metabolites II and III being detected. Covalent binding to liver macromolecules was not determined.

The following information is taken into account for any hazard / risk assessment:

1.3-Diphenylguanidine is readily absorbed from the gastrointestinal tract of rats, distributed quickly to all tissues examined, metabolized to three major and two minor metabolites (not identified), and excreted in urine and feces. Slower clearance of a minor component was observed in liver, but the significance of this observation is unknown.
Value used for CSA: no bioaccumulation potential

Dermal absorption

The absorption and disposition 1,3-diphenylguanidine was reported by Shah et al. (1985) after dermal administration to female Sprague-Dawley rats.
In female Sprague-Dawley rats, which had received a single dermal application of 0.063 mg14C-1,3-diphenylguanidine/animal (0.3µmol), only 10% of the14C activity penetrated the shaven skin of the back within 5 days with an apparent first-order dermal absorption rate of 0.021 ± 0.002 d-1and a t1/2of 33.6 days. Distribution throughout the entire organism also occurred here.
The highest14C activities after dermal administration were measured in the liver, kidneys, intestines and its content, and excreta.
Maximum tissue concentrations after dermal application were reached 3-6 hours after the start of the experiment.
Within 120 hours after dermal application 64% of the absorbed14C activity was excreted in the urine and 29% in the faeces.
Accumulation in the adipose tissue was not observed.

Relative amounts of DPG and DPG metabolites present in treated skin and excreta

		% metabolites			^{14}C-DPG (%)
Excreta or Organ	Time(h)	II	IV	V	
Urine	24	50 ± 5.3	-	-	50 ± 5.3
	48	53 ± 1.7	-	-	47 ± 1.5
	72	57 ± 5.2	-	-	43 ± 5.2
	96	100	-	-	0
	120	100	-	-	0
Faeces	24	-	-	100	-
	48	-	15	85	-
	72	-	20	80	-
	96	-	26	74	-
	120	-	26	74	-
Skin	6-120	-	-	-	>95

The following information is taken into account for any hazard/ risk assessment:
1,3-Diphenylguanidine is slowly absorbed after dermal application to rats, only 10% of the 14C activity penetrated the shaven skin of the back within 5 days with an apparent first-order dermal absorption rate of 0.021 ± 0.002 d-1 and a t1/2of 33.6 days.
Value used for CSA: Absorption rate (%): 10

Acute toxicity:

LD50(Oral, Rat): 111 mg/kg bw (male), 107 mg/kg bw (female)
LD50(Oral, Rabbit): 2000 mg/kg bw
LD50(Inhalation, Rat): Not available

Skin corrosion/Irritation: Causes skin irritation.

Serious eye damage/irritation:	Causes serious eye irritation.
Respiratory or skin sensitization:	Not sensitizing
Germ cell mutagenicity:	Negative
Carcinogenicity:	Study scientifically unjustified
Reproductive toxicity:	Suspected of damaging fertility or the unborn child
STOT- single exposure:	STOT Single Exp. 3, May cause respiratory irritation or May cause drowsiness or dizziness.
STOT-repeated exposure:	Not classified
Aspiration hazard:	Not available

12. Ecological Information

Toxicity:

Acute toxicity		***Time***	***Species***	***Method***	***Remarks***
LC50	4.2 mg/L test mat. (meas. (initial))	96h	Fish	US EPA Ecological Research series 660/3-75009	2 (reliable with restrictions) key study experimental result
EC50	17 mg/L	48h	Daphnia Magna	APHA 1975 US EPA Ecological Research series 660/3-75009	2 (reliable with restrictions) key study experimental result
EC50	1.7 mg/L	96h	algae	Static method US EPA, 1971, Algae assay procedure : bottle test	2 (reliable with restrictions) supporting study experimental result

General notes: This statement was deduced from the properties of the single components. Avoid transfer into the environment. Due to available data on eliminability/decomposition and bio accumulation potential prolonged term damage of the environment cannot be excluded. Water hazard class (German regulation) (Assessment by list): hazardous for water. Do not allow product to reach ground water, water course or sewage system. Dane to drinking water if even small quantities leak into the ground. Also poisonous for fish and plankton in water bodies toxic for aquatic organisms.

Persistence and degradability:	Inherently biodegradable
Bioaccumulative potential:	DPG has a low potential for bioaccumulation
Mobility in soil:	DPG (1,3-diphenylguanidine) is expected to have very slight mobility based upon an estimated Koc of 5,900
Results of PBT&vPvB assessment:	DPG is not PBT nor vPvB
Other adverse effects:	Not applicable.

13. Disposal Considerations

Waste treatment methods: Avoid discharge into the environment. This material and its container must be disposed of as hazardous waste. Accordance with all local, state, and federal regulations.

Product/Packaging disposal:	If empty container retains product residues, all label precautions must be observed. Return for reuse or dispose according national or local regulations.

14. Transport Information

D.O.T. Shipping Name	UN 3077 Class: 9 Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (1,3-diphenylguanidine) Packaging group: III
Air - ICAO (international Civil Aviation Organization)	UN 3077 Class: 9 Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (1,3-diphenylguanidine) Packaging group: III
Sea - IMDG (International Maritime Dangerous Goods)	UN 3077 Class: 9 Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (1,3-diphenylguanidine) Packaging group: III

15. Regulatory Information

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

United States:	SARA Section 355 Substance is not listed SARA Section 313 Substance is not listed TSCA Substance is listed
Proposition 65	Substance is not listed
Carcinogenic Categories	
EPA	Substance is not listed
IARC	Substance is not listed
TLV	Substance is not listed
NiOSH-CA	Substance is not listed
OSHA-Ca	Substance is not listed
Canada domestic substances list DSL:	Substance is listed
Canada Ingredient Disclosure list	Substance is not listed.

16. Other Information

The above information has been compiled from what we believe to be credible sources. To our knowledge the information is accurate and reliable, however, it is not guaranteed. Any recommendations issued by HB Chemical personnel or literature is derived from experience and by no means should be taken as fact or construed as a recommendation to violate of any law, regulation or patent. It is the users responsibility to determine the suitability of any HB supplied material in their application. The individual conditions of each customer are well outside of our control and we cannot be held liable for its functionality and use. Please contact our office should you need specific information beyond what is supplied above. As with all Chemical usage safety precautions beyond the stated are highly recommended.