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Safety Data Sheet



Section 1: Identification

Product Identifier	HydraForce product series, Hydra and Titan 2000 Emulsion based.
Other means of identification	Ammonium nitrate-based mining explosive, blasting explosive
Recommended use of the chemical and restrictions on use	HydraForce product series are blasting explosives for mines, using Platinum Blasting Services technology. The preparation and delivery of the HydraForce products at mines' blastholes require a licensed MPU. HydraForce is made from S2 Hydra emulsion and ANFO (up to 50% w/w) HydraForce products are classed as security sensitive ammonium nitrate (SSAN) in Australian states and therefore Platinum Blasting services personnel and other users or customers may need security clearances when handling the products.
Details of manufacturer	Platinum Blasting Services Pty Ltd ABN 67 600 020 488 Level 12, 500 Queen St Brisbane QLD 4000
Emergency phone number	1800 885 411 / 24 hours

Section 2: Hazard identification

GHS and DG classification of the HydraForce product series	Based on the components of HydraForce product series (S2 Hydra emulsion and ANFO), the series are classified as hazardous chemical according to Safe Work Australia [1]. HydraForce product series is classified as Dangerous Goods by the criteria of the Australian Code for the Transport of Explosives by Road and Rail (7.7 th ed.)[2].	
Hazardous classification of S2 Hydra product	Explosive Oxidising Liquid Category 2 Eye Irritation Category 2A Carcinogenicity – category 1B Aspiration hazard – category 1 Skin irritation – category 2 Reproductive toxicity – category 2 AUH044: Risk of explosion if heated under confinement	
Label elements		
Signal word	Danger	
Labelling		
Hazard statements	H201	Explosive; mass explosion hazard

	H272	May intensify fire; oxidiser
	H319	Causes serious eye irritation
	H304	May be fatal if swallowed and enters airways
	H315	Causes Skin irritation
	H350	May cause cancer
	H361	Suspected of damaging fertility or the unborn child
	AUH044	Risk of explosion if heated under confinement
Precautionary Statements	Prevention	
	P201	Obtain special instructions before use.
	P202	Do not handle until all safety precautions have been read and understood
	P210	Keep away from heat, sparks, open flames or hot surfaces. - No smoking
	P220	Keep away from clothing and other combustible materials.
	P250	Do not subject to grinding, shock, friction, impact, electrical energy from extraneous source (lighting, static electricity, stray currents, galvanic electricity or electromagnetic radiation) or any form of heating.
	P264	Wash hands thoroughly after handling
	P280	Wear protective gloves, protective clothing and eye protection.
	Response	
	P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER
	P308 + P313	IF exposed or concerned: Get medical advice/attention
	P331	Do NOT induce vomiting
	P370 + P372 + P380 + P373	In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.
	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, seek medical advice/attention
	P362+P364	Take off contaminated clothing and wash it before reuse.
	P302+P352	IF ON SKIN: Wash with plenty of soap and water
	P333+P313	If skin irritation or occurs - seek medical advice/attention.
	Storage	
	P401	This product must be stored fit for purpose silos / tanks approved by Platinum Blasting Services. Alternative storage approach might be used if a risk assessment is conducted and reviewed by Platinum Blasting Services
	Disposal statements	
	P503	Refer to Platinum Blasting Services disposal instructions in Section 13

Section 3: Composition/information on ingredients

Ingredient	CAS	Content	Ingredient classification (as per GHS)
Ammonium nitrate	6484-52-2	> 50%	H272 H319
Fuels, Diesel No 2	68476-34-6	< 10%	H304 H351
Distillates (petroleum), solvent-dewaxed heavy paraffinic	64742-65-0	< 1%	H315 H350 H361
Water	7732-18-5	< 25%	
Non-hazardous component (s)	Various	< 1.0%	

Section 4: First aid measures

Eye contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> • Wash out immediately with fresh running water. • Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. <p>Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</p>
Skin contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> • Immediately remove all contaminated clothing, including footwear. • Flush skin and hair with running water (and soap if available). <p>Seek medical attention in event of irritation.</p>
Inhalation	<p>If fumes products are inhaled remove from contaminated area. Other measures are usually not necessary.</p>
Ingestion	<p>If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. Seek medical advice.</p>

Section 5: Fire-fighting measures

HydraForce product series are made on site (mine) by a MPU and the amount in the vehicle is lower than 500kg.

Suitable extinguishing media	<p>If fire occurs in the HydraForce at the pumps in the manufacturing plant / service plant, shutdown the process and use water to extinguish the fire. If fire persists, evacuate the area If fire occurs in the in MPU (cabin, engine, etc), shut down the system and use the vehicle fire extinguisher. If fire persists and looks likely to reach MPU auger, where HydraForce would be present, evacuate the area to a distance determined by Platinum Blasting Services.</p>		
Special Hazards arising from the substrate or mixture	<p>At the beginning of a fire, HydraForce products (due to their oxidising characteristics) may support combustion of other material and increase the intensity of a fire, releasing harmful gases. Ultimately the HydraForce products may explode if under fire. There is a risk of harmful fumes during the fire. Wind directions should be determined when evacuating.</p>		
Advice for firefighters	<table border="1"> <tr> <td>Fire Fighting</td> <td> <p>Alert emergency services about the fire (an emergency plan must be in place). The area where the fire is taking place must be evacuated as a fire may involve a risk of explosion. HydraForce products, being heated by fire, may decompose first and may emit irritating, poisonous or corrosive fumes such as:</p> <ul style="list-style-type: none"> • carbon monoxide (CO) • carbon dioxide (CO₂) • nitrogen oxides (NO_x) <p>Firefighters must pay attention to the wind direction and fume movement. Firefighters must not approach MPU to fight the fire. An exclusion area must be keep according to Platinum Blasting Services emergency plan.</p> </td> </tr> </table>	Fire Fighting	<p>Alert emergency services about the fire (an emergency plan must be in place). The area where the fire is taking place must be evacuated as a fire may involve a risk of explosion. HydraForce products, being heated by fire, may decompose first and may emit irritating, poisonous or corrosive fumes such as:</p> <ul style="list-style-type: none"> • carbon monoxide (CO) • carbon dioxide (CO₂) • nitrogen oxides (NO_x) <p>Firefighters must pay attention to the wind direction and fume movement. Firefighters must not approach MPU to fight the fire. An exclusion area must be keep according to Platinum Blasting Services emergency plan.</p>
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Section 6: Accidental release measures

HydraForce products series have a very short interaction with operators - the products are made next to the blasthole by an MPU at a maximum rate of 500 – 1000 kg/minute. It is anticipated that in an event of spillage, the total amount would be less than 2 tonnes, and this would happen inside of a mine site, not public roads.

Personal precautions	<p>Avoid walking through spilled product. Avoid all contact with skin and eyes. PPE must be worn – see section 8 for details. Always wash hands with soap and water after handling spilt product. DO NOT allow clothing wet with material to stay in contact with skin</p>
Environmental precautions	<p>Clean up immediately using with non-metallic implements (spark free shovel) to avoid friction and impact when collecting material. Addition of water to the spilt material is recommended. Scoop up material and collect in properly labelled containers, with loose fitting lids and properly labelled, for disposal. This material is classified as a Security Sensitive Ammonium Nitrate (SSAN). Spillage recovery needs to be appropriately documented and material accurately accounted for.</p>

	<p>For large spillage (> 100kg), do not use large equipment to collect spilt material (front loader). Alert site fire brigade and tell them location and nature of hazard. DO NOT mix fresh with recovered material. Ensure that contaminated material, like clothing, is thoroughly washed before re use and surfaces (truck, MPU, floor in manufacturing plants) are decontaminated before re-start. Avoid spill and pick up material to contact any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials like copper / brass, as secondary reactions may result. Prevent entry of the product into cavities or drainage systems such as sewers, drains, waterways, streams, ponds or basements or confined areas. If contamination of drains or waterways occurs advise emergency services.</p>
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Section 7: Handling and storage



HydraForce product series are handled by mechanical means in the MPU – pumps and augers. HydraForce product series have been designed for manufacture and delivery in one step into a blast hole. Therefore, storage of the product in the MPU manufacture or another type of storage is not allowed. Small samples of less than 1kg can be stored for assessment (quality, density check, etc).

Handling - General information	<p>Platinum employees must wear PPE when handling the product – see Section 8. HydraForce products series is handled by mechanical means like pumps, therefore, the potential contact product –personnel is only limited to take samples of HydraForce products to measure density or drippings when moving auger from blast hole to blasthole. In normal conditions, Bulk HydraForce products' series should not find any product / surface that are incompatible with. The products do not produce mist or sprays or dusts. Always wash hands after handling and before smoking, eating, drinking or using the toilet.</p>
Conditions for safe Storage and handling, including any incompatibilities	<p>This product is not designed for storage in bulk – The product is blended and delivered into blast holes by a MPU using Platinum Blasting Services technology. Platinum employees must wear PPE when handling the product – see Section 8. HydraForce bulk product series are handled in the MPU using Platinum approved pumps and augers. Once finished pumping / delivering product for the day, MPU auger must be cleaned to avoid the presence of sensitised product in them overnight. Small samples can be taken in field when the trucks make the product – for example to measure density of the final product and monitor crystallisation, etc. Where possible use plastic elements to handle the product (plastic containers, plastic spatula, etc). A site-specific risk assessment must be conducted if the sample needs to be stored over time – it should be in a 1.5D licensed magazine for not more of 20 days. Consider compatibility with any other product already stored in the magazine. Small samples of products could also be made at Platinum laboratories. Platinum has specific procedures for those situations. Remove contaminated clothing and protective equipment before entering eating areas Keep product away from heat (truck's exhaust or any other hot surface), flammables or combustibles. Keep cool, dry and away from incompatible materials (for example solution for gassing). Samples taken to conduct density measurements during manufacturing and delivery can be returned to the MPU's hopper. Deteriorated product. Should the product deteriorate / breakdown during pumping, consult a Platinum specialist personnel BEFORE attempting to continue pumping this product.</p>

Section 8: Exposure controls/personal protection

In standard operations, operators should not be exposed as the product is moved using pumps. The products do not produce mist or sprays or dusts during manufacture.

Exposure controls measures	HydraForce products series' exposure limits have not been determined by Safe Work Australia or any other agency. However, it is recommended to follow the available exposure limits for HydraForce products series raw materials (diesel, oils and ammonium nitrate).				
		TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
	Ammonium nitrate		10		
	Oils [3]	Poses no unreasonable risk to human health based on Tier I assessment under the NICNAS IMAP assessment framework			
Appropriate engineering controls	Under normal conditions, HydraForce products series' manufacture is conducted in an enclosed system. Therefore, over-exposure to airborne concentration to oil mix not expected to occur.				
Individual protection measures, such as Personal Protective Equipment (PPE)	The minimum recommended PPE and their standard when the HydraForce product series are handled is as follow				
		AS/NZS 1337.1:2010. Personal eye protection Eye and face protectors for occupational applications			
		AS NZS 4501.1 - 2008 Occupational protective clothing - Guidelines select, use, care and maintenance			

	AS/NZS 2161.1:2016. Occupational protective gloves, Part 1: Selection, use and maintenance AS/NZS 2161.3:2020. Occupational protective gloves, Part 3: Protection against mechanical risks
	AS/NZS 2210.1:2010 Safety, protective and occupational footwear - Guide to selection, care and use

Section 9: Physical and chemical properties

Physical state	Granular material with some oily layer	pH (as supplied)	N/A
Colour	Off white	Viscosity (Pa*s)	20 – 50 Pa*s
Odour	N/A	Solubility in water	Soluble in water
Melting / freezing point (°C)	< 0°C	partition coefficient: n-octanol/water (log value)	
Initial boiling point and boiling range (°C)	> 100°C	Vapour pressure (kPa)	N/A
Flammability	N/A	Relative density (Water = 1)	0.95 – 1.33 g/ml @ 15 - 30°C
Upper Explosive Limit (%)	N/A	Vapour density (Air = 1)	N/A
Lower Explosive Limit (%)	N/A	Explosion Data – Sensitivity to Mechanical Impact	Not sensitive to mechanical impact events present at the MPU.
Flash point (°C)	N/A	Explosion Data – Sensitivity to Static Discharge	Not sensitive to static discharge
Auto-ignition temperature (°C)	N/A	Explosive properties	Explosive once in the auger of the MPU
Decomposition temperature	> 100°C	Molecular weight (g/mol)	N/A
Evaporation rate	N/A	Surface Tension (dyn/cm)	N/A

Section 10: Stability and reactivity

HydraForce products series are made in a controlled environment (mine site) and risk assessment have been conducted to prevent any unwanted reaction with materials present at the bench.

Reactivity	However, HydraForce products series could react with pyrites present at the mine site. A reactive ground tests must be conducted using AEISG Code of Practice for Reactive ground before using the HydraForce products series in new mine sites.
Chemical Stability	HydraForce products series are stable under the conditions present at the MPU. However, product may crystallise – if this occurs, production must stop. Platinum Blasting Services technical personnel must be contacted.
Conditions to avoid	Avoid exposure to friction, heat, shock, sources of ignition, and open flame. Potential source of heat / fire is a malfunctioning of the pumps (causing dead heading or dry running) in the MPU.
Incompatible materials	No reaction of HydraForce products series is expected to occur with the materials / surfaces present in the MPU. However, HydraForce products series contain ammonium nitrate which is a strong oxidising agent and therefore incompatible with inorganic nitrites which are present in the tanks storing effect chemicals in the MPU. Materials which could react with ammonium nitrate are tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromates, chlorates, chlorites, hypochlorites, permanganates, perchlorates, chloroisocyanurates, strong alkalis, strong acids, any combustible material and metal powders. However, these materials are not expected to be present during the life cycle of the product.
Hazardous decomposition products	Under normal conditions of use, at the mine sites, HydraForce products series are stable. However, nitrogen oxides and carbon monoxide may be emitted under heat – see “conditions to avoid” above.

Section 11: Toxicological information

HydraForce product's components are not toxic and do not react with each other and as a result no different chemicals are formed.

Acute toxicity	There is no LD50 data available for the HydraForce product. Ammonium nitrate, the Oral LD50 (rat) = 2217 mg/kg., Dermal LD50 (rabbit): 3000 mg/kg. [4]
Skin corrosion / irritation	While no data are available for ammonium nitrate, no significant adverse effects were reported following skin sensitisation exposure to another nitrate compound which contained both of the constituent ions of the chemical. In a skin sensitisation study (local lymph node assay: OECD TG 429), mice were exposed to calcium ammonium nitrate at doses of 0 %, 10 %, 25 % and 50 % (five animals per/dose) on three consecutive days. The test groups had calcium ammonium nitrate applied directly to the dorsal surface of both ears.

	While erythema was shown to occur in all animals at 50 % and in one animal at 25 %, the stimulation index (SI) for skin sensitisation was reported to be <3. Therefore the chemical is not considered to be a skin sensitiser. Additionally, no change in body weight, no mortality, no systemic toxicity or oedema was reported for any treatment group of animals (REACH) [5]
Serious eye damage / irritation	In an OECD guideline study (TG 405), 100 mg of ammonium nitrate was applied to the eyes of rabbits over a 24-hour exposure period. It was reported that animals tested had an average score for redness of the conjunctivae of >2.5 during the first 3 days after exposure. The effects were reported to be fully reversible within 7-10 days (REACH). In another study in rabbits, ammonium nitrate was reported to be moderately irritating to the eyes, causing conjunctival effects and mild iritis (inflammation), although no corneal effects were noted. The effects were reported to be fully reversible after 7 days (REACH). There is sufficient evidence to classify ammonium nitrate as an eye irritant (H319) [5].
Respiratory or skin sensitisation	The chemical was not found to be a skin irritant in New Zealand White rabbits when tested according to OECD Test Guideline (TG) 404. Rabbits were exposed to 0.5 g of the chemical under occlusive conditions moistened with water, over four hours and observed during a 72 hour period (at 1, 25, 48 and 72 hours). It was reported that exposure to the chemical resulted in low Draize scores with no reported oedema (swelling) or erythema (redness) (REACH) [5].
Germ cell mutagenicity	Data not available
Carcinogenicity	Data not available
Reproductive toxicity	Data not available
Specific Target Organ Toxicity (STOT)— single exposure	Data not available
Specific Target Organ Toxicity (STOT)— repeated exposure	Data not available
Aspiration hazard	A case study in humans reported that no systemic oral toxicity was observed in 23 patients who had taken up to 9 g of ammonium nitrate daily for an undefined period of time. The chemical was taken as a preventive treatment for calcium phosphate renal stones (OECD 2007; REACH). Another case study reported oral ingestion of the chemical (single doses between 64 and 234 grams) by five patients which did not cause severe toxic effects. However, some patients experienced gastritis (inflammation of the lining of the stomach), slightly increased methaemoglobin levels, and mild hypertension (high blood pressure) (OECD 2007; REACH)[5].

Section 12: Ecological information

HydraForce products' series has not been tested for aquatic toxicity or other ecotoxicological effects. However, if product enters water way, ammonium nitrate will start leaching from the product almost immediately. Therefore, the ecological information of HydraForce products' series is based on the ecological information of ammonium nitrate

Ecotoxicity	Toxicity of nitrates (Ammonium nitrate, calcium nitrate, calcium nitrate double salt, magnesium nitrate, Nitcal-K, potassium nitrate and sodium nitrate were evaluated) to fish [6]. <ul style="list-style-type: none"> Acute – LC50 >100 mg/L Long term - NOEC 58 mg/L (study on sodium nitrate) Toxicity of nitrates to aquatic invertebrates: <ul style="list-style-type: none"> Acute – LC50 >100 mg/L Long term - unavailable
Persistence and degradability	The mixture itself has not been tested for aquatic toxicity or other eco-toxicological effects, and therefore the classification of the mixture is based on the classification of individual components. This material has been classified as non-hazardous. Acute toxicity estimate (based on ingredients): >100 mg/L The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment
Bioaccumulative potential	No data is available on ammonium nitrate.
Mobility in soil	No data is available on ammonium nitrate.
Other adverse effects	No data is available on ammonium nitrate.


Section 13: Disposal considerations

HydraForce products' series, under unexpected conditions, could crystallise. Platinum Blasting Services will provide guidance for the disposal of the product.

HydraForce products' series are classified as a Security Sensitive Explosive (SSE) in Australia, disposal of material needs to be appropriately documented and material accurately accounted for.

Section 14: Transport information

HydraForce products series are classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail. However, these products are explosives, and they must not be transported in bulk. They must be manufactured on site and loaded immediately by using an MPU. Should a need to transport this product in quantities smaller than 5 kg (for special tests), Platinum Blasting services must be contacted before shipping, and the below marking must be used.

Road and Rail Transport	UN No:	0241
	Proper Shipping Name or technical name	Explosive, Blasting, Type E
	Transport Hazard Class:	1.5D
	Packing group	II
	Dangerous Goods Class Label	
	Hazchem or Emergency Action code	E
Marine Transport	Contact Platinum Blasting services representative	
Air Transport	Contact Platinum Blasting services representative	

Section 15: Regulatory information

Hazard Classification	The hazard classification has been based on HydraForce products' series main components - ammonium nitrate, diesel and oils. These or parts of these components are classified as Hazardous chemicals by SafeWork Australia. AICIS report was consulted to prepare this SDS [7].
Dangerous Good classification	HydraForce products' series are classified as Dangerous Goods by the criteria of the Australian Code for the Transport of Explosives by Road and Rail
Security	Chemicals used in the preparation of HydraForce products' series are included in the list of 96 'Chemicals of Security Concern' identified by the Council of Australian Governments (COAG). This listing has an additional note for Security Sensitive Ammonium Nitrate (SSAN), where specific state-based restrictions apply: 'ammonium nitrate, ammonium nitrate emulsions and ammonium nitrate mixtures containing greater than 45 per cent ammonium nitrate excluding solutions' (SafeWork SA). Losses, theft, attempted theft and unexplained discrepancies shall be reported to authorities. Record keeping and licensing of individuals shall be required and maintained.
Poison schedule	none allocated

Section 16: Other information

The following sources were consulted in the preparation of this SDS

Model Code of Practice: Preparation of safety data sheets for hazardous chemicals – SafeWork Australia

Classifying hazardous chemicals, National guide, SafeWork Australia 2020

Hazardous Chemical Information System (HCIS) - <http://hcis.safeworkaustralia.gov.au/>

Chemical assessment database at <https://www.industrialchemicals.gov.au/chemical-information/search-assessments>

Australian Code for the Transport of Dangerous Goods by Road & Rail

Model Work Health and Safety Regulations as at 1 January 2021 as released by Safe Work Australia

The chemical is also included in the list of 96 'Chemicals of Security Concern' identified by the Council of Australian Governments (COAG).

National Library of Medicine (NIB)

European Chemical Agency (ECHA)

Cameo chemicals

Abbreviations

ADG	Australian Dangerous Goods
ECHA	The European Chemical Agency
MPU	Mobile processing unit
GHS	Globally Harmonised System
Kg	Kilo
NOEC -	No Observed Effect Concentration
SSAN	Security sensitive ammonium nitrate
SSE	Security Sensitive Explosive

TWA	The time weighted average airborne concentration of a particular substance when calculated over an eight-hour working day, for a five-day working week.
STEL	Short Term Exposure Limit. the airborne concentration of a particular substance calculated as a time- weighted average of 15 minutes, which should not be exceeded at any time during a normal eight-hour workday.

Disclaimer

To the best of our knowledge the information contained within this document is accurate at the time of publishing. Platinum Blasting Services assumes no liability whatsoever for the accuracy of completeness of information contained herein. Since Platinum Blasting Services cannot anticipate or control the conditions under which the product may be used, each user must, prior to use assess and control the risks associated with the application of the product.

For any clarification or further information please contact Platinum Blasting Services. This product is supplied under Platinum Blasting Services standard terms and conditions unless otherwise agreed prior.

References

- 1 HCIS database, <http://hcis.safeworkaustralia.gov.au/HazardousChemical/Details?chemicalID=3220>
- 2 https://www.ntc.gov.au/sites/default/files/assets/files/ADG%20Code%207.7_0.pdf
- 3 <https://www.industrialchemicals.gov.au/chemical-information/search-assessments?assessmentcasnumber=8012-95-1#cas-number>
- 4 <https://www.cdc.gov/niosh-rtecs/BR8A1790.html>
- 5 https://www.industrialchemicals.gov.au/sites/default/files/Nitric%20acid%2C%20ammonium%20salt_Human%20health%20tier%20I%20assessment.pdf
- 6 <https://echa.europa.eu/registration-dossier/-/registered-dossier/15999/6/2/1>
- 7 <https://www.industrialchemicals.gov.au/chemical-information/search-assessments?assessmentcasnumber=6484-52-2>