Printing date 09/03/2009 Reviewed on 09/03/2009

1 Identification of substance

· Product details

· Trade name: Einrohrdämpfer

Mono tube shock absorber

· Application of the substance / the preparation Shock Absorber

· Manufacturer/Supplier:

ThyssenKrupp Bilstein Tuning GmbH

Milsper Straße 214 D-58240 Ennepetal Tel: +49 2333-791- 0 Fax: +49 2333-791-4900

· Information department:

Tel: +49 2333-791-4780

Email: Thomas.A. Woermann@thyssenkrupp.com • Emergency information: Tel: +49 2333-791- 0

2 Composition/Data on components

- · Chemical characterization
- · Description: The shock absorber contains nitrogen and small amounts of hydraulic oil.
- Dangerous components: Void
- Additional information:

The mono tube absorbers contain up to 0.3 I compressed gas (nitrogen) at a pressure of 5 to 30 bar.

The maximum product of pressure and volume is 18 bar * l.

3 Hazards identification

- · Hazard description: Not applicable.
- Information pertaining to particular dangers for man and environment:

Warning! Pressurized container.

Nitrogen is suffocating by replacing ambient oxygen.

The product does not have to be labelled due to the calculation procedure of international guidelines.

· Classification system:

The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

NFPA ratings (scale 0 - 4)



Health = 0 Fire = 0 Reactivity = 0

- HMIS-ratings (scale 0 - 4)



Health = 0 Fire = 0 Reactivity = 0

4 First aid measures

- · General information: No special measures required.
- · After inhalation:

Provide fresh air. Keep victims quiet and warm.

In case of unsteady breathing or apnoea induce artificial respiration.

Call a doctor immediately.

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Mono tube shock absorber

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· After skin contact: Generally the product does not irritate the skin.

· After eye contact: If symptoms persist consult doctor.

· After swallowing: Swallowing is not considered to be a possible way of exposure.

5 Fire fighting measures

Suitable extinguishing agents:

The product itself does not burn.

Use fire fighting measures that suit the environment.

Special hazards caused by the material, its products of combustion or resulting gases:

Formation of toxic gases is possible during heating or in case of fire.

In case of fire, the following can be released:

Carbon monoxide (CO)

Nitrogen oxides (NOx)

· Protective equipment:

In case of fire wear breathing equipment being independent of ambient air and suit provided full protection against chemicals.

Additional information

Remove fill mass from incendiary zone, if possible.

Cool endangered receptacles with water spray.

6 Accidental release measures

· Person-related safety precautions:

Ensure adequate ventilation

Keep away from ignition sources

Measures for environmental protection:

Inform authorities in case of gas release.

Do not allow to enter sewers/ surface or ground water.

· Measures for cleaning/collecting:

Absorb with liquid-binding material (sand, diatomite, universal binders) and disposal in suitable containers.

7 Handling and storage

- · Handling:
- Information for safe handling:

Keep empty containers away from heat and ignition sources.

Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air). No special measures required.

• Information about protection against explosions and fires: The product is not flammable.

- Storage:
- · Requirements to be met by storerooms and receptacles:

Store containers in a well aired place at a temperature of less than 50 ℃.

Store only undamaged original packaging drums.

· Information about storage in one common storage facility:

Keep away from combustible and/or inflammable materials.

Further information about storage conditions:

Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.

Storage class:

2A (Compressed, liquidized and under pressure solved gases) according to VCI concept

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Mono tube shock absorber

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8 Exposure controls and personal protection

· Components with limit values that require monitoring at the workplace:

7727-37-9 nitrogen

TLV Simple asphyxiant

- Additional information: The lists that were valid during the creation were used as basis.
- · Personal protective equipment:
- · General protective and hygienic measures: Wear suitable protective clothing at work.
- · Breathing equipment: Not required.
- Protection of hands:

Not required.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection: Not required.

9 Physical and chemical properties

· General Information		
Form:	Shock absorber, pneumatic / hydraulic Condensed gas	
Color:	Colorless	
Odor:	Odorless	
· Change in condition Melting point/Melting range: Undetermined. Boiling point/Boiling range: n.a. ℃		
Flash point:	Not applicable.	
· Auto igniting:	Product is not selfigniting.	
· Danger of explosion:	Product does not present an explosion hazard.	
· Density:	Not determined.	
· Solubility in / Miscibility wit Water:	th Insoluble.	
Solvent content:		
Organic solvents:	0.0 %	
Water:	0.0 %	
VOC content:	0.0 %	
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· Additional information: The bonfire-test resulted in flying away components.

10 Stability and reactivity

· Thermal decomposition / conditions to be avoided:

No decomposition if used and stored according to specifications.

- Dangerous reactions Danger of receptacles bursting because of high vapor pressure if heated.
- · Dangerous products of decomposition:

None in case of intended use and storage in compliance with instructions.

11 Toxicological information

- · Acute toxicity:
- · Primary irritant effect:
- · on the skin: No irritant effect.
- · on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- · Additional toxicological information:

When inhaling high concentrations narcotic symptoms are possible.

The product is not subject to classification according to internally approved calculation methods for preparations:

12 Ecological information

General notes:

Water hazard class 1 (Self-assessment): slightly hazardous for water The product contains materials that are harmful to the environment.

13 Disposal considerations

- Product:
- · Recommendation: Contact manufacturer for recycling information.
- Uncleaned packagings:
- · Recommendation: Dispose of packaging according to regulations on the disposal of packagings.

14 Transport information

· Land transport ADR/RID (cross-border):



· ADR/RID class: 2 6A Gases

· UN-Number: 3164· Label: 2.2

· Description of goods: 3164 ARTICLES, PRESSURIZED, PNEUMATIC

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Trade name: Einrohrdämpfer

Mono tube shock absorber

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· Remarks: Special Provision: 594

· Maritime transport IMDG:



· IMDG Class: 2.2
 · UN Number: 3164
 · Label 2.2
 · EMS Number: F-C,S-V
 · Marine pollutant: No

· Propper shipping name: ARTICLES, PRESSURIZED, PNEUMATIC

· Air transport ICAO-TI and IATA-DGR:



· ICAO/IATA Class: 2.2 · UN/ID Number: 3164 · Label 2.2

· Propper shipping name: ARTICLES, PRESSURIZED, PNEUMATIC

15 Regulations

· Sara

· Section 355 (extremely hazardous substances):

None of the ingredient is listed.

Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

· TSCA (Toxic Substances Control Act):

All ingredients are listed.

- Proposition 65
- · Chemicals known to cause cancer:

None of the ingredients is listed.

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

· Cancerogenity categories

EPA (Environmental Protection Agency)

None of the ingredients is listed.

· IARC (International Agency for Research on Cancer)

None of the ingredients is listed.

· NTP (National Toxicology Program)

None of the ingredients is listed.

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TLV (Threshold Limit Value established by ACGIH)

None of the ingredients is listed.

· AGW (German Maximum Workplace Concentration)

None of the ingredients is listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

Canadian substance listings:

· Canadian Domestic Substances List (DSL)

All ingredients are listed.

· Canadian Ingredient Disclosure list (limit 0.1%)

None of the ingredients is listed.

· Canadian Ingredient Disclosure list (limit 1%)

None of the ingredients is listed.

Product related hazard informations:

Although this product is not subject to identification regulations, we recommend that the safety suggestions are observed.

The product is not subject to identification regulations according to directives on hazardous materials.

· Safety phrases:

Keep in a cool place.

· National regulations:

· Other regulations, limitations and prohibitive regulations

The regulations concerning pressure vessels and gases under pressure have to be observed.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing MSDS:

This Material Safety Data Sheet has been drawn up in cooperation with:

DEKRA Umwelt GmbH, Hanomagstr. 12, D-30449 Hannover,

Tel.: +49.511.42079-311.

* Data compared to the previous version altered.

USA

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MATERIAL SAFETY DATA SHEET

MSDS Number Monotube 1

ThyssenKrupp Bilstein



GAS CHARGED SHOCK ABSORBER (MONOTUBE)

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

ThyssenKrupp Bilstein of America 8685 Berk Blvd.	EMERGENCY TELEPHONE NO.: 513-881-7600
Hamilton, Ohio 45015	Quality & Environmental Systems Department
Contact John McKinnie 513 881-7600 john.mckinnie@tka-bia.thyssenkrupp.com	
TRADE NAME: Gas Charged Shock Absorber (Monotube)	MSDS NUMBER / REVISION: (MSDS No. 1)/ 1
Part Number 15152948, 15153092, 15727198, 15735786, 15741932, 15032676, 15034310, 15034311, 15739207, 15998555, 15023686, 15756219, 15756220	ORIGINAL ISSUE DATE: Issued: 11/12/02
CHEMICAL NAME: Gas Charged Shock Absorber SYNONYMS: Shock Absorber: Module	PREPARED BY: D.Suffel

2. INGREDIENTS

Component	Formula	CAS#	Mass %	ACGIH (TLV) (mg/M³)	OSHA (PEL) (mg/M³)
Steel		Not Est.	80-85%	5 *	5 *
Hydraulic fluid Hydro treated light naphthenic distillate	TITAN SAF 1579	64742-53-6	10-12%	5	5
Sintered iron	Fe	7439-89-6	3-3,5%	5	5
Synthetic material	-	Not Est.	0,3-0,35%	Not Est.	Not Est.
Aluminum	Al	7429-90-5	2-2,5%	total dust 10 fume 5	total 15 fume 5
Nitrile rubber	NBR	Not Est.	0,03-0,035%	Not Est.	Not Est.
Cured paint		Not Est.	0,15-0,2%	Not Est.	Not Est.
Chrome plating	Cr	7440-47-3	< 0,03%	0.5	1
Pressurized nitrogen gas	N ₂	7727-37-9	< 0,03%	Not Est.	Not Est.

^{* =} Exposure limits are based on iron-containing welding fumes. with your local, state and federal regulator.

In its manufactured and shipped state, the product may be considered non-hazardous under normal and expected conditions of use. Cutting, grinding, or other abrasive work on the part may result in generation of dusts, fumes, and/or particulate matter that may be hazardous. The shock in this product also contains air or Nitrogen under pressures that can approach 14-18 bar (200-300 psig).

EMERGENCY OVERVIEW

In its manufactured and shipped state the product is considered non-hazardous. Pick up and place in appropriate containers for reuse or disposal. Severely damaged product may release hydraulic fluid. Wear appropriate personal protective equipment. Prevent any released hydraulic fluid from entering storm or sanitary sewers, ground water or soil by diking with sand, earth, or other non-reactive material. Absorb released material with a sorbent suitable for organic materials and place in appropriate containers for disposal. Wastes generated during cleanup operations should be evaluated to determine if they are hazardous wastes and disposed of in accordance with all local, state and federal regulations at a properly permitted facility. Releases may be reportable to local, state and/or federal authorities. Product involved in a fire situation may present a potential bursting hazard due to over-pressuring of the gas reservoir. Cool product in or near fires with a water spray or fog and keep all unnecessary individuals well clear of the area.

^{*** =} SARA 313 reporting requirements will most likely be article exempted, but check

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3. POTENTIAL HEALTH EFFECTS:

In its manufactured and shipped state and under normal and expected conditions of use, the product is not expected to cause any acute or chronic health effects. The health effects listed below are for hydraulic fluid and dusts, fumes, and particulate matter that may be generated if product is subjected to cutting, grinding, sanding or other abrasive work practices.

<u>Eve</u>: Hydraulic fluid may cause irritation. Dusts, fumes, and mists that may be generated by

mechanical abrasion or other work practices may cause irritation.

Skin Contact: Hydraulic fluid may cause irritation on prolonged contact. Dusts, fumes, and mists that

may be generated by mechanical abrasion or other work practices may cause irritation.

Skin Absorp-

tion:

This is not expected to be an entry route into body.

Ingestion: This is not expected to be a major route into body. Ingestion of large quantities of hy-

draulic fluid may cause digestive system distress and may have pronounced laxative ef-

fect.

Inhalation: High concentration of airborne hydraulic fluid aerosols, mists, or vapors may cause irrita-

tion of mouth, throat, mucous membranes, and respiratory tract. High concentrations of metal or paint dusts, fumes or particulate matter may cause irritation of mouth, throat,

mucous membranes, and respiratory tract.

Chronic &

Carcinogenic Affects:

Prolonged skin contact with hydraulic fluid may cause a drying or chapping effect of the exposed area, normally the hands. This condition is known as dermatitis. Inhalation or ingestion of lead-containing materials may cause lead poisoning. Symptoms of lead poisoning may include gestraintestinal disturbances anamic mysels weekness, notantial necessing may include gestraintestinal disturbances anamic mysels weekness, notantial necessing.

soning may include gastrointestinal disturbances, anemia, muscle weakness, potential paralysis of the hands and feet, and central nervous system dysfunction. Lead is known to have adverse reproductive effects in males and females and may cross-placental barrier and affect fetus. It may possibly aggravate pre-existing skin, respiratory, central nervous

system or kidney disorders.

4. FIRST AID MEASURES

Inhalation: Remove exposed person to fresh air. If breathing is difficult, oxygen may be adminis-

tered. If breathing has stopped, artificial respiration should be started immediately. Seek

medical attention.

Eyes: Flush with tepid water for at least 20 minutes holding eyelids wide open. Seek medical

attention if irritation develops.

<u>Skin</u>: Wash thoroughly with mild soap and water. Seek medical attention if irritation develops.

Remove any contaminated clothing and launder thoroughly before reuse.

<u>Ingestion:</u> This is not expected to be an important route of entry into body. If large amounts of hy-

draulic fluid are ingested, do not induce vomiting. Material may be aspirated into lungs

and cause severe chemical pneumonities. Seek medical attention immediately.

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5. FIRE FIGHTING MEASURES

FLASH POINT: >140°C (284°F) LEL: 0.6% UEL: 6.5%

AUTO IGN. TEMP: > 360°C (6804°F).

Use foam, dry chemical or carbon dioxide to extinguish fires involving hydraulic fluid. Water may be ineffective and cause fire to spread. Product in or near fires should be cooled with a water spray or fog to prevent over-pressuring and possible bursting or rupture of product. A self-contained breathing apparatus (SCBA), operating in positive pressure mode and full fire fighting protective clothing should be worn for combating fires.

6. ACCIDENTAL RELEASE MEASURES

Pick up units and return to original packing if reusable. If not reusable, place in DOT approved containers for disposal. Absorb any released hydraulic fluid with a sorbent designed for organic materials and place sorbent and absorbed materials in appropriate containers for disposal. Wastes generated during cleanup operations should be evaluated to determine if they are hazardous wastes and disposed of in accordance with all local, state and federal regulations at a properly permitted facility. Prevent hydraulic fluid from entering storm or sanitary sewers, ground water, or soil. Releases may be reportable to local, state and/or federal authorities. Keep unnecessary individuals out of the area. Wear appropriate personal protective equipment.

7. HANDLING AND STORAGE

Store intact units at ambient temperatures out of contact with the elements. Keep from contact with strong mineral acids and oxidizers. The metal body of product may react with strong acids to produce highly flammable hydrogen gas. Hydraulic fluid that has been removed from the shock body for subsequent disposal should be stored away from strong oxidizers, open flames, or other potential ignition sources.

8. EXPOSURE CONTROL - PERSONAL PROTECTION

ENGINEERING CONTROLS: These are not required under normal and expected conditions of use. If operations or work practices will generate hydraulic fluid aerosols, mists, or vapors or produce metal or paint dusts, fumes, or particulate matter, local exhaust ventilation should be provided to maintain exposures below limits cited in Section 2. Design details for local exhaust ventilation systems may be found in the latest edition of "Industrial Ventilation: A Manual of Recommended Practices": published by ACGIH Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48910. Need for local exhaust ventilation should be evaluated by a professional industrial hygienist. A professional engineer should design local exhaust ventilation systems.

RESPIRATORY: Respiratory controls are not required under normal and expected conditions of use. If operations or work practices may produce hydraulic fluid aerosols, mists, or vapors or metal or paint dusts, fumes, or particulate matter, and exposures may exceed the limits cited in Section 2 by less than a factor of ten, use as a minimum a NIOSH approved 1/2 face piece respirator equipped with cartridges approved for organic vapors and particulate matter with an exposure limit of not less than 0.05 mg/M³. If exposures exceed 10 times the recommended limits or 1,000 ppm, consult a professional industrial hygienist or your respiratory protective equipment supplier for selection of proper equipment. A professional industrial hygienist should evaluate and determine the need for respiratory protection.

EYE PROTECTION: Safety glasses with side shields are recommended.

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PROTECTIVE GLOVES: These are not required under normal and expected conditions of use. Nitrile gloves are recommended if it is necessary to handle hydraulic fluid.

GENERAL: All soiled or dirty clothing and personal protective equipment should be thoroughly cleaned before reuse. Wash hands and/or other body part frequently with fresh water and soap.

9. PHYSICAL AND CHEMICAL PROPERTIES

The following apply to the hydraulic fluid contained in product. Product itself is an elongated, painted, metallic shape with no odor and has a density of approximately 6.

APPEARANCE & PHYSICAL STATE:	Red liquid	MELTING POINT:	≈ -55°C (-67°F)
VAPOR DENSITY (AIR=1):	Not Applicable	OCTANOL/WATER PARTITION COEFFICIENT:	Not Determined
VAPOR PRESSURE @ 20°C (70°F):	<< 1 mm Hg	EVAPORATION RATE BUOAC = 1:	<< 1
ODOR:	Mineral Oil	SPECIFIC GRAVITY / BULK DEN- SITY @ 15°C (59°F):	SG = 0.84 - 0.87
% VOLATILE BY VOLUME:	Not Volatile	BOILING POINT:	> 300°C (572°F)
% SOLUBILITY (H ₂ O):	Insoluble	pH:	Not Applicable
OTHER:	Not Applicable	VISCOSITY @ 40°C (104°F)	\approx 12.9 mm ² /s

10. STABILITY AND REACTIVITY

STABILITY & POLYMERIZATION: Product is stable. Hazardous polymerization will not occur.

INCOMPATIBILITY (CONDITIONS TO AVOID): Do not store product at temperatures above 50°C (122°F). Do not expose to strong acids or oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: When burned, hydraulic fluid may produce dense smoke, oxides of carbon, phosphorus and sulfur and low molecular weight organic species whose composition and toxicity have not been determined.

SPECIAL SENSITIVITY: None that are known

11. TOXICOLOGICAL INFORMATION

Base oil contained in hydraulic fluid is hydro treated light naphthenic distillate (64742-53-6). This material has a low degree of acute toxicity (LD₅₀ Rat > 5000 mg/kg, (LD₅₀ Rabbit Skin > 3000 mg/kg), and has not been specifically listed as a carcinogen or potential carcinogen. Hydraulic fluid contains a proprietary additive package that contains small amounts of nitrogen, phosphorus and sulfur-containing materials. The manufacturer of hydraulic fluid does not indicate materials in additive package are highly toxic at concentrations present in hydraulic fluid.

12. ECOLOGICAL INFORMATION

Detailed studies have not been conducted concerning the environmental fate of the product. Hydraulic fluid may be toxic to aquatic and terrestrial flora and fauna.

13. DISPOSAL CONSIDERATIONS

Prior to disposal of metal shock body, gas pressure inside shock absorber body must be relieved and hydraulic fluid drained by a knowledgeable, qualified mechanic. Recycling of removed hydraulic fluid and metal Rev.: 1

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shock body is recommended method of disposal. All wastes should be evaluated in conjunction with applicable solid and hazardous waste regulations and disposed of as appropriate.

It is the user's responsibility to dispose of all wastes in accordance with all local, state and federal regulations at properly permitted or authorized facilities.

14. TRANSPORTATION INFORMATION

DOT CLASSIFICATION:

THIS PRODUCT IS NOT CONSIDERED HAZARDOUS [PER 49 CFR §173.306 (f) (4)] AND DOES NOT NEED TO BE CLASSIFIED FOR TRANSPORTATION BY SHIP, RAIL, TRUCK, OR AIR. The following classification is for reference purposes only.

UN 3164 Articles, Pressurized, Pneumatic; Class 2.2; Packing Authorization 208.

LABELS: No special labeling is required for transport by ship, rail, truck, or air.

RESTRICTION: No restrictions exist for passenger or cargo aircraft.

15. REGULATORY INFORMATION

OSHA Hazard Communication Classification: Intact Product: Non-Hazardous

Hydraulic Fluid: Irritant

SARA Title III Classification: Sudden Release of Pressure.

SARA 313 reporting requirements: Reporting will most likely be article exempted, but check with your

local, state and federal regulator.

WHMIS Classification: Compressed Gas

16. OTHER INFORMATION

HMIS Classifications: Intact product: Health = 0, Fire = 0, Reactivity = 0

Hydraulic Fluid: Health = 1, Fire = 1, Reactivity = 0

All components of the product are included in the Toxic Substances Control Act (TSCA) inventory.

Revision	Date	Approved	Change
Release	11/12/02	D.Suffel	Initial release

NOTICE TO USERS:

ThyssenKrupp Bilstein requests product users study this material safety dada sheet (MSDS) and become aware of product hazards and safety information. To promote safe product use, 1) notify employees, agents, and contractors of MSDS information and any product hazard and safety information, 2) furnish same information to all customers for this product and 3) request customers notify their employees and customers of product hazards and safety information.

Opinions expressed herein are those of qualified experts within ThyssenKrupp Bilstein. We believe information contained herein is current as of the date of this MSDS. Since product use is not within control of ThyssenKrupp Bilstein, it is user's obligation to determine conditions of safe product use.