



ForceField® Dry Cleaning Fluid

SAFETY DATA SHEET

Product Name: ForceField Dry Cleaning Fluid Date Printed: 1/22/2018
Product Use/Class: Solvent-Based Cleaner for Dry Clean Only Fabrics Product ID: F DCF

Supplier: Shield Industries, Inc. Manufacturer: Shield Industries, Inc.
Address: 131 Smokehill Lane Address: 131 Smokehill Lane
 Woodstock, GA 30188 - USA Woodstock, GA 30188 - USA
Telephone: 770-517-6869 24 Hour Emergency Hotline: 800-535-5053

SECTION 2 – HAZARD IDENTIFICATION:

Physical hazards:	Flammable liquids	Category 3
Health hazards:	Aspiration hazard	Category 1
	Skin irritation	Category 2
	Specific target organ toxicity, single exposure	Category 3
	Eye irritation	Category 2
	Skin sensitization	Category 1

Environmental hazards: Very toxic to aquatic life with long lasting effects. (H410)
OSHA defined hazards: Not classified.

Label elements:



Signal word: Danger

Hazard statement Flammable liquid and vapour. (H226)
May be fatal if swallowed and enters airways.(H304)
Causes skin irritation. (H315)
May cause drowsiness or dizziness. (H336)
Causes serious eye irritation. (H319)
May cause an allergic skin reaction. (H317)
Harmful if swallowed, in contact with skin or if inhaled.
(H302 + H312 +H332)

Precautionary statements:

Prevention: Keep away from heat/sparks/open flames/hot surfaces. –
No smoking. (P210)
Take Precautionary measures against static discharge. (P243)
Wear protective gloves/protective clothing/eye protection/face
protection. (P280)
Use explosion-proof electrical/ventilating/lighting/equipment. (P241)
Ground/bond container and receiving equipment. (P240)
Use only non-sparking tools. (P242)
Keep container tightly closed. (P233)
Wear protective glove/protective clothing/eye protection/face
protection. (P280)
Use only outdoors or in a well-ventilated area. (P271)
Avoid breathing vapours. (P261)
Wash hands and exposed skin thoroughly after handling. (P264)
Contaminated clothing should not be allowed out of the workplace. (P272)
Avoid releases to the environment. (P273)

Response: IF SWALLOWED: Immediately call a POISON CENTER or doctor/
physician. (P301 + P310)
Do NOT induce vomiting. (P331)
IF INHALED: Remove victim to fresh air and keep at rest in a position
comfortable for breathing. (P304 + P340)
IF IN EYES: Rinse cautiously with water for several minutes. Remove
contact lenses, if present and easy to do. Continue rinsing.
(P305 + P351 + P338)
If eye irritation persists: Get medical advice/attention. (P337 + P313)
IF ON SKIN (or hair): Remove/Take off immediately all contaminated
clothing. Rinse skin with water/shower. (P303 + P361 + P353)
If skin irritation or rash occurs: Get medical advice/attention. (P332 +

P313)

Wash contaminated clothing before reuse. (P363)
In case of fire: Use dry sand, dry chemical or alcohol resistant foam for
extinction. (P370 + P378)

Storage: Store in a well-ventilated place. Keep cool. (P403 + P235)
Store locked up. (P405)

Disposal: Dispose of contents/container to an approved waste disposal plant. (P501)

**Hazard(s) not otherwise
classified (HNOC):** None.

Supplemental information: None.

SECTION 3 COMPOSITION/INFORMATION ON COMPONENTS

<u>COMPONENTS</u>	<u>CAS NUMBER</u>	<u>%</u>
Alkanes, C9-11-iso	68551-16-6	50 - 80 %
2-Butoxyethanol	111-76-2	30 - 50 %
d-Limonene	5989-27-5	5 - 20 %

* Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Additional Information:

Substances in the product which may present a health or environmental hazard, or which have been assigned occupational exposure limits, are below: (See Sections 11 and 12 for greater detail.)

d-Limonene	5989-27-5
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SECTION 4 FIRST AID MEASURES

Inhalation: Move person to fresh air and keep at rest in a position comfortable for breathing. If breathing is labored, administer oxygen. Contact a POISON CENTER or doctor/physician. Risk of serious damage to the lungs.

Skin contact: If on skin, wash thoroughly with soap and water. If on clothes, remove clothing. Get medical attention if irritation develops and persists.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Keep eyes wide open and continue rinsing. Get medical attention if irritation develops and persists.

Ingestion: Keep respiratory tract clear. Rinse mouth with water. Do NOT induce vomiting. Do NOT give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Contact a POISON CENTER or doctor/physician immediately.

Most important symptoms/effects, acute and delayed:

Breathing difficulties. Symptoms of overexposure may include: headache, drowsiness and dizziness, tiredness, nausea and vomiting. May cause allergic skin reaction. Symptoms of allergic reaction may include: rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing.

Indication of immediate medical attention and special treatment needed:

If ingested: Immediately seek medical attention. Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information:

More affected persons from dangerous area. Do not leave victim unattended. Symptoms of poisoning may only appear several hours later. Ensure that medical personnel are aware of the material(s) involved. Show this safety data sheet to the doctor in attendance.

SECTION 5 FIRE FIGHTING MEASURES

Suitable extinguishing media:

Alcohol resistant foam. Dry chemical. Carbon dioxide (CO₂).

Unsuitable extinguishing media:

Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical:

Combustible. Risk of ignition. Vapours may form explosive mixtures with air. Vapours may travel to source of ignition and flash back. Combustion or thermal decomposition will evolve irritating gases and vapours and/or fumes of oxides of carbon. Keep product and empty container away from heat and sources of ignition. Containers may explode when heated. Do not allow run-off from fire-fighting to enter drains or water courses.

Special protective equipment and precautions for firefighters:

Firefighters must use standard full protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent).

Fire-fighting equipment/instructions:

Move containers from fire area if you can do so without risk. Containers should be cooled with water to prevent vapour pressure build up.

Specific methods:

Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. In the event of fire and/or explosion do not breathe fumes.

General fire hazards:

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area) and take measures against static discharges. Wear appropriate protective equipment and clothing during clean-up. Do not breathe vapours. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.

Environmental precautions:

Avoid release to the environment. Avoid discharge into drains, water courses or onto the ground. Prevent further leakage or spillage if safe to do so. Inform appropriate managerial or supervisory personnel and authorities of all environmental releases.

Methods and materials for containment and cleaning up:

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Use spark-proof tools and explosion-proof equipment. Stop leak if you can do so without risk. Move the containers to a safe and open area if the leak is irreparable. Isolate area until vapours have dispersed. Prevent entry into waterways, sewer, basements or confined areas.

Contain spillages and then collect with sand, earth, diatomaceous earth, vermiculite, or any other suitable adsorbent material. Collect spillage. Transfer to a container for disposal or recovery. Following product recovery, flush area with water. If possible prevent water running into sewers. For waste disposal, see section 13 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling:

Do not aerosolize this product. If this product is to be sprayed, use ONLY LOW PRESSURE (less than 60 psi) SPRAYER. Do not breathe vapours/dust. Avoid contact with skin and eyes. Wear appropriate personal protective equipment. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as contents may be under pressure. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

Advice on protection against fire and explosion:

Take precautionary measures against static discharges. Keep away from open flames, hot surfaces and sources of ignition. Use only spark-proof tools and explosion-proof equipment.

Conditions for safe storage, including any incompatibilities:

Store locked up. No smoking. Keep container tightly closed in a dry and well-ventilated place. Keep cool. Store at temperatures not exceeding 50 °C (122 °F). Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations/working materials must comply with the technological safety standards. This material is a potential static accumulator. Containers should be grounded and bonded. Avoid storing in the presence of oxidizing agents or water.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits:

US. ACGIH Threshold Limit Values

<u>Components</u>	<u>CAS</u>	<u>Type</u>	<u>Value</u>
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Iso-alkanes (C9-C11)	68551-16-6	TWA	100 ppm
2-Butoxyethanol	111-76-2	TLV	25 ppm
d-Limonene	5989-27-5	TLV	*30 ppm

*Note: The ACGIH TLV listed above for d-Limonene is an AIHA WEEL.

Appropriate engineering controls:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. Maintain airborne levels to acceptable levels based upon the values listed above. Explosion-proof electrical/ventilating/lighting equipment is recommended. Use proper grounding and bonding procedures. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment:

Eye/face protection:

Wear safety glasses with side shields (or goggles). Eye wash bottle with pure water.

Hand protection:

Wear appropriate chemical resistant gloves (Butyl rubber, Neoprene, or Natural rubber). Check with protective equipment manufacturer's data.

Skin protection/Other:

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection:

Not normally required in the presence of adequate mechanical/local ventilation. If permissible levels are exceeded, or if irritation or other symptoms are experienced, use NIOSH mechanical filter / organic vapor cartridge or an air-supplied respirator. (See 29 CFR 1910.134 and/or European Standard EN 149.)

Thermal hazards:

Not normally required.

General hygiene considerations:

When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Physical state:	Liquid
Form:	Liquid
Color:	Clear to slightly hazy pale yellow color
Odor:	Characteristic, Mild Sweet Citrus
Odor threshold:	Not available.
pH:	Not available.
Melting point/freezing point:	Not available.

Initial boiling point and boiling range	160 °C estimated
Flash point:	> 102 °F (38.9 °C) estimated
Evaporation rate:	1 estimated
Flammability (solid, gas):	Not available.
Upper/lower flammability or explosive limits:	
Flammability limit – lower (%):	Not available.
Flammability limit – upper (%):	Not available.
Explosive limit - lower (%):	0.7 v/v (Isoparaffic hydrocarbons)
Explosive limit - upper (%):	5.6 v/v (Isoparaffic hydrocarbons)
Vapor pressure:	6.18 mm Hg @100 °F estimated
Relative Vapor density:	4.5 (Air = 1.0) estimated
Relative density:	0.80 +/- 0.05 @ 60.1 °F
Solubility (water):	Somewhat miscible
Partition coefficient (n-octanol/water):	Not available.
Auto-ignition temperature:	446 °F (230 °C) estimated
Decomposition temperature:	Not available.
Viscosity (kinematic cSt @ 40 °C):	Not available.
Other information:	Not available.

SECTION 10 STABILITY AND REACTIVITY

Reactivity:

The product is stable and non-reactive under normal ambient conditions of use, storage and transport.

Chemical stability:

Material is stable under normal conditions.

Possibility of hazardous reactions:

Hazardous polymerization is not anticipated to occur.

Conditions to avoid:

Avoid contact with heat, flame, ignition sources and incompatible materials.

Incompatible materials:

Strong oxidizing agents and acids.

Hazardous decomposition products:

At temperatures over 200 C, or under fire conditions, oxides of carbon can form.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Ingestion: May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

Inhalation: May cause damage to organs through prolonged or repeated exposure by inhalation. May cause drowsiness and dizziness. Headache. Nausea, vomiting. Prolonged inhalation may be harmful. Breathing this material may cause central nervous depression.

Skin contact: May causes skin irritation, dryness and/or dermatitis.

Eye contact: Vapors may cause irritation to the eyes. Liquid contact will cause stinging and tearing.

Symptoms related to the physical, chemical and toxicological characteristics:

May cause drowsiness and dizziness. Headache. Nausea, vomiting. Irritation of nose and throat. Eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and/or degreasing of skin.

Information on toxicological effects:

Acute toxicity: May be fatal if swallowed and enters airways.

Components	CAS#	Test	Species	Test Results
Alkanes, C9-11-iso	68551-16-6	Acute Oral LD50	Rat	34,600 mg/kg
		Acute Inhalation LC50	Rat	12.4 mg/l, 4 Hours
		Acute Dermal LD50	Rabbit	15,400 mg/kg
2-Butoxyethanol	111-76-2	Acute Oral LD50	Rat	1,746 mg/kg
		Acute Inhalation LC50	Rat	700 ppm, 7 Hours
		Acute Dermal LD50	Rat	> 2,000 mg/kg
d-Limonene	5989-27-5	Acute Oral LD50	Rat	4,400 mg/kg
		Acute Dermal LD50	Rabbit	> 5,000 mg/kg

Skin corrosion/irritation: May cause skin irritation and/or dermatitis.

Serious eye damage/eye irritation: Vapours may cause eye irritation.

Respiratory or skin sensitization:
Respiratory sensitization: Vapours may cause irritation.
Skin sensitization: May cause sensitization by skin contact.
 (d-Limonene CAS# 5989-27-5)

Germ cell mutagenicity: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity: This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
 Not listed.

Repeated dose toxicity:
 Component: Alkanes, C9-11-iso
 Species: Rat
 Application Route: Inhalation
 Dose: 0, 314, 922 ppm
 Exposure Time: 12 weeks
 Number of exposures: 6 h/d, 5 d/week

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NOEL: >922 ppm

Component: 2-Butoxyethanol
Species: Rat
Application Route: Inhalation
LOAEC: 152 mg/m³ (Blood)

Component: d-Limonene
Species: Mouse
Application Route: Ingestion
LOAEC: 3,300 mg/m³

Specific target organ toxicity - single exposure:

May cause drowsiness and dizziness.

Teratogenicity:

Component: Alkanes, C9-11-iso
Species: Rat
Application Route: Inhalation
Dose: 0, 291, 817 ppm
Number of exposures: 6 h/d
Test Period: GD 6-15
NOAEL Teratogenicity: > 817 ppm
NOAEL Maternal: > 817 ppm

Aspiration hazard:

May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

SECTION 12 ECOLOGICAL INFORMATION

Ecotoxicity: Toxic to aquatic life with long lasting effects.

Acute Toxicity:

<u>Components/CAS</u>	<u>Test</u>	<u>Species</u>	<u>Test Results</u>
Alkanes, C9-11-iso/ 68551-16-6	Aquatic Fish LC50	Rainbow trout	1,000 mg/l, 96 hr.
	Aquatic Crustacea EC50	Water flea (Daphnia magna)	1,000 mg/l, 48 hr.
2-Butoxyethanol/ 111-76-2	Aquatic Fish LC50	Fish	1,490 mg/l, 96 hr.
d-Limonene/ 5989-27-5	Aquatic Fish LC50	Rainbow trout	35 mg/l, 96 hr.
	Aquatic Crustacea EC50	Water flea (Daphnia pulex)	69.6 mg/l, 48 hr.
	Aquatic Fish LC50	Fathead minnow (Pimephales promelas)	0.619 – 0.796 mg/l, 96 hr.

Long Term Toxicity:

Components/CAS	Test	Species	Test Results
No data available.			
Persistence and degradability:			
d-Limonene:			71% - Readily biodegradable. (OECD Test Guideline 301B)
Alkanes, C9-11-iso:			Expected to be biodegradable.
2-Butoxyethanol:			No data available
Bioaccumulative potential:			
No data available.			
Mobility in soil:			
No data available.			
Results of PBT and vPvB assessment:			
Not classified as PBT or vPvB.			
Other adverse effects:			
None known.			

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment/disposal instructions:

This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Waste from residues / unused products:

Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. Dispose of in accordance with local regulations.

Contaminated packaging:

Exercise caution as empty containers or liners may retain some product residues. Do not re-use empty containers. Do not burn, or use a cutting torch on, empty containers. Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14 TRANSPORT INFORMATION



DOT

UN number:	NA1993
UN proper shipping name:	Combustible liquid, n.o.s.
Transport hazard class(es):	
Class:	Combustible Liquid
Subsidiary risk:	-
Label(s):	Combustible Liquid

Packing group: III
Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.
Environmental hazards: Yes
Special provisions: None Assigned
Packaging exceptions:
Packaging non bulk:
Reclassified as a “combustible liquid” according to 49 CFR 173.120 (b)(2). Not regulated for ground shipment in the U.S. in non-bulk packaging (<119 gallons).
Packaging bulk:
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable

IATA

UN number: UN1268
UN proper shipping name: Petroleum Distillates, n.o.s.
Transport hazard class(es):
Class 3
Subsidiary risk -
Label(s) Flammable liquid
Packing group III
Environmental hazards Yes
ERG Code 10L
Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling. Read Safety instructions, SDS and emergency procedures before handling.
Packaging bulk:
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable

IMDG

UN number: UN1268
UN proper shipping name: Petroleum Distillates, n.o.s.
Transport hazard class(es):
Class: 3
Subsidiary risk: -
Label(s): Flammable Liquid
Packing group: III
Environmental hazards:
Marine pollutant: Yes
Special precautions for user:
Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.
Packaging bulk:
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable

SECTION 15 REGULATORY INFORMATION

US federal regulations:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List or polymer exempt.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D):

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

No Listed materials.

SARA 311/312 – Superfund Amendments and Reauthorization Act of 1986:

Hazard categories:

Immediate Hazard	Yes
Delayed Hazard	Yes
Fire Hazard	Yes

SARA 313 – Toxic Chemicals (40 CFR 372):

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ethylene glycol monobutyl ether (CAS# 111-76-2)

SARA 302 Threshold Planning Quantity:

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302. The reportable quantity (RQ) for this material is >3000 pounds (based upon content of Ethylene glycol monobutyl ether (CAS# 111-76-2)). If appropriate, immediately report to the National Response Center (800-424-8802) as required by U.S. Federal Law if the RQ is exceeded. Also contact state and local agencies.

Other federal regulations:

Clean Air Act (CAA) Ozone-Depletion Potential:

This product neither contains, nor was manufactured with a Class I, or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App. A+B).

Clean Water Act (CWA):

Water This product contains Glycol Ethers, chemicals that are listed under the Clean Act.

US state regulations

U.S. California Proposition 65:

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive effects.

International Inventories

Country(s) or region (yes/no)*	Inventory name	On inventory
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	
Yes		

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Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

- A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s) A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

SECTION 16 OTHER INFORMATION

NFPA RATING: HEALTH: 2 FLAMMABILITY: 2 REACTIVITY: 0

PREPARATION INFORMATION:

DATE CREATED: 01/01/06 LAST REVISION: 12/12/2017
CREATED/REVISED BY: R. Lasnik

This information relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability, or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

End of SDS