



U.S. Department  
of Transportation

**Research and  
Special Programs  
Administration**

400 Seventh Street, S.W.  
Washington, D.C. 20590

MAY - 1 1993

Ms. Barb Germano  
Myers Industries  
1293 S Main Street  
Akron, OH 44301

Dear Ms. Germano:

This is in response to your letter regarding the classification of an aerosol containing carbon dioxide and trichloroethylene in 16 ounce cans for shipment by vessel in accordance with the International Maritime Dangerous Goods (IMDG) Code. You asked if you are correct in classifying and describing the material as an "Aerosol". I apologize for the delay in responding and hope it has not caused any inconvenience.

Under 49 CFR 173.22, it is the shipper's responsibility to properly classify a hazardous material. This office does not perform that function. Based on the information you provided on the Material Safety Data Sheet enclosed with your letter, it is the opinion of this Office that your material is an "Aerosol, Division 2.2" (nonflammable gas). Under the HMR, aerosols must comply with the requirements in 49 CFR 173.306(a)(3). The following description applies:

"Aerosols, 2.2, UN 1950, Limited Quantity"

Under the HMR, with certain exceptions, if all or part of the transportation is by vessel, a hazardous material which is classed, packaged, marked, labeled, placarded and described in accordance with the requirements of the IMDG Code may be offered and accepted, and transported in the United States (see 49 CFR 171.12(b)). The IMDG Code permits aerosols with a capacity not exceeding 1000 ml to be transported in accordance with the limited quantity provisions in Section 18 of the General Introduction of the IMDG Code. In that case, the following description and marking is appropriate:

"Aerosols, Class 2, UN 1950, Limited Quantity"      For 1000 ml or less, package may be  
marked "AEROSOLS" (Instead of  
Non-flammable (Gas label))

You may wish to consult Section 18 of the IMDG Code for further information on excepted documentation on package marking.

For your information, in a final rule published in the **Federal Register** under Docket HM-215B [62 FR 24690; 05/06/97], in 49 CFR 171.8, the term "Aerosol" was defined. Aerosol means any non-refillable metal receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

I hope this information is helpful. If I can be of further assistance, please contact us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Delmer F. Billings".

Delmer F. Billings  
Chief, Standards Development  
Office of Hazardous Materials Standards

*Engrum  
File: 172.101(a)  
SC: 412, 423*

**Myers Industries  
1293 S Main St  
Akron, OH 44301**

**Fax Cover Sheet**

**DATE:** November 6, 1997

**TO:** Helen Engrum **PHONE:**  
U.S. D.O.T. **FAX:** 202-366-8700

**FROM:** Barb Germano **PHONE:** 330-253-5592  
Myers Industries **FAX:** 330-761-6156

**RE:** International Shipments

**We are trying to ship (internationally) 16 ounce aerosol cans containing Trichloroethylene. Using IMDG regulations, this product is considered an Aerosol, Class 2, UN 1950.**

**The IMDG Book states that no label, other than the marking "Aerosols" is necessary for quantities of less than 1000 cm3 (quart).**

**The trucking company we are using has called and said that this must be labeled "Stow Away From Foodstuffs".**

**If I am correct about the Proper Shipping Name being Aerosols, are we allowed to follow the IMDG page and mark the carton as Aerosols?**

**I also sending a copy of the MSDS and the IMDG page.**

**Would you please answer in writing.**

**Thank you**

**Myers Industries**  
**1293 S Main St**  
**Akron, OH 44301**

## **Fax Cover Sheet**

**DATE:** November 6, 1997

**TO:** Helen Engrum  
U.S. D.O.T.

**PHONE:** 202-366-4473  
**FAX:** 202-366-8700

**FROM:** Barb Germano  
Myers Industries

**PHONE:** 330-253-5592  
**FAX:** 330-761-6156

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I also sending a copy of the MSDS and the IMDG page.

Would you please answer in writing.

Thank you

Post-it* Fax Note	7671	Date	# of pages
To	HELEN	From	
Co/Dept.		Co.	
Phone #		Phone #	
Fax #		Fax #	

△△  
AEROSOLS △△

UN No. 1950      Formula

Explosive  
Limits

Properties

**MARINE POLLUTANT**

Applicable only to products containing 10% or more of substance(s) identified with "P" or 1% or more of substance(s) identified with "PP" in the General Index to this Code.

▷ "AEROSOLS" meaning ◁ aerosol dispensers are any non-refillable receptacles meeting the requirements of paragraph 8.9 of Annex I, made of metal, glass or plastics and containing a gas compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.

Observations

▷ ◁  
The ▷ aerosols ◁ should comply with the provisions of the country in which they are filled.

They should be provided with protection against inadvertent discharge. They should be of a type which shows no visible leakage ▷ ◁ or loss of contents of more than 1% in mass ▷ (or 1 gram if the total contents are less than 100 grams) ◁ when stored for 18 hours at 55°C. This temperature may be reduced to 45°C for carriage solely within temperate climates (i.e. in latitudes greater than 30° North or South).

▷ A label of class 2.1 applies if the contents include more than 45% by mass, or more than 250 g of flammable components. Flammable components are gases which are flammable in air at normal pressure or substances or preparations in liquid form which have a flashpoint less than or equal to 100°C.

The provisions of this Code should not apply to aerosols with a capacity of less than 50 cm<sup>3</sup>.

The provisions of this Code should not apply to aerosols with a capacity of 1000 cm<sup>3</sup> or less when the following conditions are met:

- no flammable gas present,
- internal pressure not greater than 8.4 kg/cm<sup>2</sup> gauge at 55°C. <sup>119 psi</sup>
- less than 10% by mass of the total contents consisting of flammable liquid,
- less than 1% by mass of toxic substances present in liquid concentrate,
- less than 0.2% by mass of corrosive substances present in the liquid concentrate. ◁

Label

▷ ACCORDING TO PROPERTIES

However, for aerosols with a capacity of 1000 cm<sup>3</sup> or less the mark "AEROSOLS" may be applied instead of a label ◁

**MARINE POLLUTANT** mark  
(for marine pollutants only)

1 qt or less  
1000 cm<sup>3</sup>

update (P)

MSDS NO: 0112

PATCH RUBBER COMPANY  
MATERIAL SAFETY DATA SHEET

Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
Product Code No.: 16-481

Page: 1 of 7  
Issue Date: 1/9/96

## MANUFACTURER:

PATCH RUBBER COMPANY  
P.O. BOX H  
ROANOKE RAPIDS, N.C. 27870

Call CHEMTREC only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals.  
(800) 424-9300 Cont. USA  
(202) 483-7616 (Collect) Alaska & Hawaii

TELEPHONE: (919) 536-2574

HEALTH EMERGENCIES:  
Call LOS ANGELES Poison Information Center  
(24 hrs.) 1-800-356-3129

PRODUCT IDENTIFICATION
------------------------

CLEANER FLUID (Non-Flammable)	16-481
-------------------------------	--------

DOT PROPER SHIPPING NAME:	Consumer Commodity
ID NUMBER:	ORM-D
DOT HAZARD CLASSIFICATION:	

SECTION I - HAZARDOUS COMPONENTS
----------------------------------

Components/Percent/Exposure Limits/Units/Agency/Type
--

Trichloroethylene (Stabilized)	90-100%	79-01-6	See Section 3
Carbon Dioxide	1-10%	124-38-9	OSHA PEL 10,000 ppm ACGIH TLV 5,000 ppm ACGIH STEL 30,000 ppm

(P)

Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
Product Code No.: 16-481

Page: 2 of 7  
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**SECTION II - EMERGENCY & FIRST AID PROCEDURES \*\*\*\*\*EMERGENCY\*\*\*\*\***

Have a physician call Los Angeles POISON  
INFORMATION CENTER (24 hrs.)  
1-800-356-3129

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**EYE OR SKIN CONTACT:** Flush eyes and skin with plenty of water (soap and water for skin) for a least 15 minutes while removing contaminated clothing and shoes. If irritation occurs, consult a physician. Thoroughly clean contaminated clothing and shoes before reuse or discard.

**INGESTION:** If conscious: Drink large quantities of water. **DO NOT** induce vomiting. Take immediately to a hospital or physician. If unconscious: or in convulsions, take immediately to a hospital. **DO NOT** attempt to give anything by mouth to an unconscious person.

**NOTES TO PHYSICIAN (INCLUDING ANTIDOTES):** Never administer adrenaline following Trichloroethylene overexposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to Trichloroethylene.

**SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY**

HEALTH HAZARD DATA

**TOXICITY DATA:**

LC 50 Inhalation:	LCLO(RATS) 8000 PPM/4 Hour
LC 50 Dermal:	Not Determined
Skin/Eye Irritation:	See Section 2
LD 50 Ingestion:	(Rat) 4900-7000 Mg/Kg
Fish. LC50 (Lethal Concentration):	See Section 3

**CLASSIFICATION: (POISON, IRRITANT, ETC.)**

Inhalation:	Slightly Toxic
Skin:	Not Determined
Skin/Eye:	Skin-Mildly Irritating/Eye Irritant
Ingestion:	Slightly to Moderately Toxic
Aquatic:	See Section 3

**TOXICITY DATA - AQUATIC DATA:**

Sheepshead Minnows - 96-Hour LC50 - 52 MG/L - Slightly Toxic  
Mysid Shrimp - 96 Hour LC 50 - 14 MG/L - Slightly Toxic  
Marine Alga - 96 Hour EC 50 - 95 MG/L - Slightly Toxic

(P)

Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
Product Code No.: 16-481

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Issue Date: 1/9/96

**SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY (continued)**

**EFFECTS OF OVEREXPOSURE:** This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

**IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?**

NTP - No    LARC - No    OSHA - No

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:**

None known.

**PERMISSIBLE EXPOSURE LIMITS:**

**OSHA:** 100 PPM, 8-Hour TWA (Time Weighted Average).  
200 PPM, Acceptable Ceiling Concentration.  
300 PPM, Acceptable maximum peak above the ceiling concentration for an 8 hour shift. The maximum duration for this exposure is 5 minutes in any 2 hours (29 CFR 1910.1000, Table Z.2).

**ACGIH:** 50 PPM, 8-Hour TWA (Time Weighted Average).  
200 PPM, STEL (Short-Term Exposure Limit).

**ACUTE:**

**INHALATION:** Trichloroethylene is a central nervous system depressant which can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, possible central nervous system damage, unconsciousness and death in confined or poorly ventilated areas. Fatalities following severe acute exposure have been attributed to ventricular fibrillation resulting in cardiac failures.

**EYES/SKIN:** Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes, and skin absorption can occur.

**INGESTION:** Swallowing of this material may result in irritation of the mouth and GI tract along with other effects as listed above for inhalation. Vomiting and subsequent aspiration into the lungs may lead to chemical pneumonia and pulmonary edema which is a potentially fatal condition.

**CHRONIC:** Prolonged exposure above the OSHA permissible limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for chronic effects in animals. While there are studies in which tumors were induced in mice, there is no evidence that Trichloroethylene poses a carcinogenic risk to humans. Trichloroethylene is listed in Group 3 by IARC and is not listed by NTP or OSHA.

(P)

Product Name: **CLEANER FLUID, AEROSOL (Non-Flammable)**  
Product Code No.: **16-481**

Page: **4 of 7**  
Issue Date: **1/9/96**

#### SECTION IV - SPECIAL PROTECTION INFORMATION

**RESPIRATORY PROTECTION:** Use a half or full face piece organic vapor chemical cartridge or canister respirator when concentrations exceed the permissible limits. Use self-contained breathing apparatus (SCBA) or full face piece airline respirator with auxiliary SCBA operated in the pressure-demand mode for emergencies and for all work performed in storage vessels, poorly ventilated rooms, and other confined areas. Respirators must be approved by NIOSH/MSHA. The respirator use limitations made by NIOSH/MSHA and by the manufacturer must be observed. Respirator protection programs must be in accordance with 29 CFR 1910.134.

**VENTILATION (TYPE):** Use local exhaust or dilution ventilation as appropriate to control exposures to below permissible limits.

**EYE PROTECTION:** Splash proof goggles.

**GLOVES:** Viton (R), Silver Shield (R), Polyvinyl Alcohol (Degrades in Water).

**OTHER PROTECTIVE EQUIPMENT:** Boots, aprons, or chemical suits should be used when necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 and 29 CFR 1910.133.

#### SECTION V - REACTIVITY DATA

**STABILITY:** Stable

**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**Conditions to Avoid:** None

**INCOMPATIBILITY (MATERIALS TO AVOID):** Avoid contamination with Caustic Soda, Caustic Potash or oxidizing materials. Shock sensitive compounds may be formed.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Hydrogen Chloride and possible traces of Phosgene.

#### SECTION VI - SPILL OR LEAK PROCEDURES \*\*HIGHWAY /RAILWAY SPILLS\*\*

Call CHEMTREC (1-800-424-9300) Cont. U.S.  
(Collect) (202-483-7616) from Alaska & Hawaii

**STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection (See Section 4) should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled materials on absorbents, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including ignitable vapors, have been removed, thoroughly wet vacuum the area. **DO NOT** flush to sewer. If area of spill is porous, remove as much contaminated earth, gravel, etc. as necessary and place in closed containers for disposal.

(P)

Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
Product Code No.: 16-481

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**SECTION VI - SPILL OR LEAK PROCEDURES \*\*HIGHWAY /RAILWAY SPILLS\*\***  
(continued)

Call CHEMTREC (1-800-424-9300) Cont. U.S.  
(Collect) (202-483-7616) from Alaska & Hawaii

**WASTE DISPOSAL METHOD:** Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Resource Conservation and Recovery Act, as well as any other relevant federal, state, local laws/regulations regarding disposal.

**SECTION VII - STORAGE AND SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:**

- DO NOT use in poorly ventilated confined spaces without proper respiratory protection (See Section 4).
- Trichloroethylene vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Store only in closed, properly labeled container.
- Liquid oxygen or other strong oxidants may form explosive mixtures with Trichloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- Avoid contamination of water supplies. Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

**OTHER PRECAUTIONS:**

- DO NOT breathe vapors. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury and possible central nervous system damage.
- Use only with adequate ventilation. Ventilation must be sufficient to limit employee exposure to Trichloroethylene below permissible limits. Observance of lower limits is advisable (Outlined in Section 3). Eye irritation, dizziness and/or drunkenness are signs of overexposure.
- Avoid contact with eyes. Will cause irritation and pain.
- Avoid prolonged or repeated contact with skin. May cause irritation or dermatitis.
- DO NOT swallow. Swallowing may cause injury or death.
- DO NOT eat, drink or smoke in work areas.
- When spraying more than one half can continuously or more than one can consecutively, use NIOSH approved respirator.



Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
 Product Code No.: 16-481

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### SECTION VII - STORAGE AND SPECIAL PRECAUTIONS (continued)

#### COMMENTS:

TSCA - Trichloroethylene is on the TSCA inventory under CAS #79-01-6.

SARA TITLE III - A) 311/312 categories - Acute and Chronic, B) listed in Section 313 under Trichloroethylene, C) not listed as an "extremely hazardous substance in Section 302.

CERCLA - Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 100 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center. 1-800-424-8802.

RCRA - Waste Trichloroethylene and contaminated soils/materials from spill cleanup and U228 Hazardous Waste as per 40 CFR 261.33 (3) and 261.7 (B) (3) for cleaning requirements for empty containers.

CANADIAN WHMIS - A) Sensitization to product: None known. B) Reproductive Toxicity: None known. C) Odor Threshold: Not known. D) Product Use: Adhesive

### SECTION VIII - FIRE & EXPLOSION HAZARD DATA

#### HAZARD RANKING

NFPA	HEALTH HAZARD:	2	0 - Least
HAZARD	FLAMMABILITY:	1	1 - Slight
CLASS	REACTIVITY:	0	2 - Moderate
	OTHER:	-	3 - High
			*- Chronic Health Effects
HMIS	HEALTH HAZARD:	1*	
HAZARD	FLAMMABILITY:	0	
CLASS	REACTIVITY:	0	
	PPE:		

FLASH POINT (METHOD USED): None when tested in accordance with DOT requirements.

FLAMMABLE LIMITS IN AIR (% BY VOLUME): LEL: 7.8% UEL: 52%

EXTINGUISHING MEDIA: Water fog, dry chemicals or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters should wear NIOSH/MSHA approved pressure-demand, self-contained breathing apparatus for possible exposure to Hydrogen Chloride and possible traces of Phosgene. Keep containers cool. Use equipment or shielding required to protect against bursting or venting containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a high energy spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7.8 - 52% by volume. Decomposition or burning can produce Hydrogen Chloride or possible traces of Phosgene. Heated cans may burst.





Product Name: CLEANER FLUID, AEROSOL (Non-Flammable)  
Product Code No.: 16-481

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**SECTION IX - PHYSICAL DATA**

Boiling Point @ 760 MM HG:	86-88C
Vapor Density (Air=1):	4.0
Specific Gravity (H2O =1):	1.4
Solubility (Weight % in Water):	0.11
Volume % Volatile:	100
Vapor Pressure:	PSIG @ 70°F; 80
Evaporation Range:	(Butyl Acetate=1): > 1
Appearance and Odor:	Clear/Ethereal

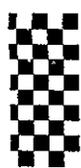
**SECTION X - DOCUMENTARY INFORMATION**

ISSUE DATE: 1/9/96	PRODUCT CODE NO: 16-481
PREV. DATE: 5/28/93	PREV. PROD. CODE NO: 16-481
MSDS NO: 0112	PREV. MSDS NO: N/A

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

PREPARED BY: Marlo Carter



# UNIROYAL CHEMICAL COMPANY

**UNIROYAL  
CHEMICAL**

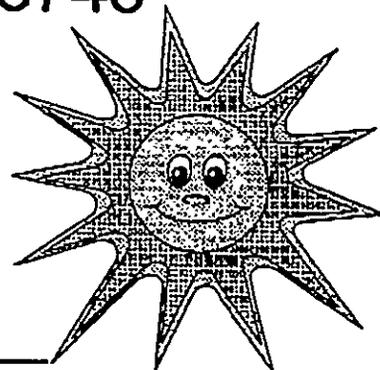
## MIDDLEBURY, CT. 06749

FAX # 203-573-2377

PHONE # 203-573-3702

TO: JENNIFER KARIM

LOCATION: U.S. DOT



FROM: Donald Hodder

DATE: 9/12/96

5 Page(s) To Follow

### MESSAGE:

PER OUR CONVERSATION I AM SENDING TEST  
RESULTS ON OUR PRODUCT CELOGEN AZ120

THIS PRODUCT IS PURE AZODICARBONAMIDE  
IN THE SMALLEST PARTICLE SIZE

PLEASE ADVISE IF YOU NEED ANY ADDITIONAL  
INFORMATION

# STRESAU LABORATORY INC.

N8265 Medley Road, Spooner, WI 54801, Tel. 715-635-2777, FAX 715-635-7979

LABORATORY REPORT NO. 95099

"UNITED NATIONS TESTING"

for

Unikroyal Chemical Co.  
World Headquarters  
Middlebury, CT 06749  
USA

Attn: Mr. Rhomie L. Heck III

April 19, 1995

Prepared by: *Vincent E. Mendoza*  
Vincent E. Mendoza  
Hazardous Materials Technician

Review: *Wayne E. Hanson*  
Wayne E. Hanson  
Development Manager

STRESAU LABORATORY, INC.  
April 19, 1995

LABORATORY REPORT NO. 95099  
Page 1 of 4

Prepared for: Uniroyal Chemical Co.  
World Headquarters  
Middlebury, CT 06749

Subject: "United Nations Testing"

1.0 Object

A sample identified as Celogen AZ-120 was subjected to Organic Peroxide testing as requested in Uniroyal Chemical Co., Inc. Purchase Order # 3352-05-147. Except where specifically noted, all tests were conducted in accordance with United Nations Transport of Dangerous Goods, Tests and Criteria, second edition (1990).

2.0 PHYSICAL APPEARANCE

The sample consisted of a light orange colored fine dry powder.

3.0 TESTS CONDUCTED

3.1 Gap Test for Organic Peroxides - Test A.3  
Stresau test #1600A

The test was conducted with the United Nations specifications, with the exception that velocity rate probes were not used. This is due to historic problems with the specified probe. The pentolite was initiated by use of a #8 electric blasting cap. Three trials were performed.

In all three trials, partial fragmentation occurred, with the specific results as follows:

- 1) 6 1/2" of pipe destroyed. The witness plate was dented.
- 2) 6 1/2" of pipe destroyed. The witness plate was dented.
- 3) 6 3/4" of pipe destroyed. The witness plate was dented.

3.2 Time / Pressure Test - Test C.1  
Stresau test #1604

The sample was tested in accordance with the United Nations test method. The test was conducted three times. The results are as follows (copy of charts attached):

STRESAU LABORATORY, INC.  
April 19, 1995

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- #1: Pressure rise exceeded 373.4 PSI in a time of 432 ms.  
Pressure rise 100-304.7 PSI in 96 ms.
- #2: Maximum pressure rise of 371.9 PSI in a time of 336 ms.  
Pressure rise 100-303.1 PSI in 90 ms.
- #3: Pressure rise exceeded 375 PSI in a time of 308 ms.  
Pressure rise 100-314.1 PSI in 68 ms.

3.3 Deflagration Test - Test C.2  
Stresau test #1605

The sample was placed in a 14 mm diameter Pyrex ignition tube and placed in a fume hood. A propane torch was ignited and placed into the sample. The sample ignited and burned the 50 mm test zone in a time of 3 minutes, 35 seconds. The test was then repeated using a 28 mm Pyrex ignition tube, with a 50 mm burn time of 3 minutes, 15 seconds.

The test was then repeated using a 0.5 liter Dewar Vessel. Two trials were conducted with the following results:

- 1: Burned 50mm without flame in 3 minutes, 21 seconds.
- 2: Burned 50mm without flame in 3 minutes, 15 seconds.

3.4 Dutch Pressure Vessel Test - Test E.2  
Stresau test #1607

For the first trial, an aperture disc of 1 mm was used. A 10 g sample of the material was poured into the pressure vessel. The rupture disc was positioned and secured with flange bolts. A small amount of water was poured over the rupture disc to keep it relatively cool. The test vessel was then positioned into the holder.

On the first trial, the pressure disc ruptured.

The vessel was cooled and cleaned, and the test was repeated with a 1.2 mm aperture. The sample did not rupture three times with the 1.2 mm aperture.

3.5 United States Pressure Vessel Test - Test E.3  
Stresau test #1608

For the first trial, an aperture disc of 1 mm was used. A 5 g sample of the material was weighed into an aluminum cup. The cup was then lowered into the center of the pressure vessel. The rupture disc was positioned and secured with flange bolts. A small amount of water was poured over the rupture disc to keep it relatively cool. The test vessel was then positioned into the holder.

STRESAU LABORATORY, INC.  
April 19, 1995

LABORATORY REPORT NO. 95099  
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On the first trial, the disc did not rupture. The vessel was cooled and cleaned, and the test was repeated with an aperture opening of 1.5 mm, with the same results. The test was then repeated with the 2.0 mm aperture three times, with no rupture. Thus, the USA-PVT number is 2.0.

### 3.6 Modified Trauzl Block Test Stresau Test #1600I

The test was conducted in accordance with the United Nations specifications. The US Department of Transportation has recommended running reference tests with the Trauzl Test. As this material is a solid, fine silicon sand was used for the reference material.

Three trials were conducted on the reference and sample, with the results as follows:

#### REFERENCE:

1: Expansion of 12ml  
2: Expansion of 13ml  
3: Expansion of 13ml  
Average Expansion 12.66ml

#### SAMPLE:

1: Expansion of 18ml  
2: Expansion of 15ml  
3: Expansion of 17ml  
Average Expansion 16.66ml

Average Expansion Sample minus Reference equals 4.0 ml.

### 4.0 SUMMARY

Following the flow chart in Section 1 of Part III of the United Nations Test & Criteria book:

Box 1: The sample does not propagate a detonation as defined by the UN Gap Test for solids.

Box 3: The sample does not propagate a deflagration as defined by the UN Deflagration Test. The sample is seen to propagate a deflagration "slowly" as defined by the Time/Pressure test.

Box 7: The sample is shown to have a "low" effect when heated under confinement by either the US Pressure Vessel or the Dutch Pressure Vessel Tests.

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Box 8: The sample has no explosive power, as defined by the Modified Trauzl Test.

Box 10: If exemption is desired you may refer to Box 7 data.

Box 11: If exemption is desired you may refer to Box 1 data.

This summary is prepared for customer information only.

#### 5.0 DATA STORAGE

The field data for this report is contained in Data Book #SLF 95-1 and filed with Stresau Laboratory's Document Control. The original charts for the Time/Pressure Test are attached to the Stresau Hazardous Materials Department office copy of this report. After a period of one calendar year, the office copy will be transferred to Document Control. No video or photographic documentation was made.