SAFETY DATA SHEET

in accordance with 29 CFR 1910.1200 / WHMIS 2015 / GHS

Revision date: 6 September 2017 **Initial date of issue:** 3 July 2007 **SDS No.** 384A-13

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

296 Electro Contact Cleaner (Aerosol)

1.2. Relevant identified uses of the substance or mixture and uses advised against

A solvent base electronic contact cleaner.

1.3. Details of the supplier of the safety data sheet

Company:
A.W. CHESTERTON COMPANY
860 Salem Street
Groveland, MA 01834-1507, USA
Tel. +1 978-469-6446 Fax: +1 978-469-6785
(Mon. - Fri. 8:30 - 5:00 PM EST)
SDS requests: www.chesterton.com
E-mail (SDS questions): ProductMSDSs@chesterton.com
E-mail: customer.service@chesterton.com
Canada: A.W. Chesterton Company Ltd., 889 Fraser Drive,
Unit 105, Burlington, Ontario L7L 4X8 – Tel. 905-335-5055

Supplier:

1.4. Emergency telephone number

24 hours per day, 7 days per week
Call Infotrac: 1-800-535-5053
Outside N. America: +1 352-323-3500 (collect)
NSW Poisons Information Centre (Australia): 13 11 26

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

2.1.1. Classification according to 29 CFR 1910.1200 / WHMIS 2015 / GHS

Flam. Aerosol 2, H223
Press. Gas (Liq.), H280
Simple Asphyxiant

2.1.2. Australian statement of hazardous nature

Hazardous according to criteria of Safe Work Australia.

2.1.3. Additional information

For full text of H-statements: see SECTIONS 2.2 and 16.

2.2. Label elements

Labelling according to 29 CFR 1910.1200 / WHMIS 2015 / GHS

Hazard pictograms:

Signal word: Warning

Hazard statements:

H223	Flammable aerosol.
H280	Contains gas under pressure; may explode if heated.

Precautionary statements:	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	P211	Do not spray on an open flame or other ignition source.
	P251	Do not pierce or burn, even after use.
	P403	Store in a well-ventilated place.
	P410/412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C.

Supplemental information: May displace oxygen and cause rapid suffocation.

2.3. Other hazards

Direct skin contact may cause skin irritation, frostbite and drying of the skin.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Hazardous Ingredients[1]	% Wt.	CAS No.	GHS Classification
1,1,1,2-Tetrafluoroethane (HFC-134a)	40-50	811-97-2 212-377-0	Press. Gas (Liq.), H280 Simple Asphyxiant
1,1,1,3,3-Pentafluorobutane (HFC-365 mfc)*	20-30	406-58-6 430-250-1	Flam. Liq. 2, H225 Simple Asphyxiant
1,1,1,3,3-Pentafluoropropane (HFC-245fa)	20-30	460-73-1 419-170-6	Press. Gas (Liq.), H280
Isopropanol	1-5	67-63-0 200-661-7	Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336

*This substance is nonflammable as combined with the other ingredients in the product.
For full text of H-statements: see SECTION 16.

[1] Classified according to: 29 CFR 1910.1200, 1915, 1916, 1917, Mass. Right-to-Know Law (ch. 40, M.G.L..O. 111F), California Proposition 65, WHMIS 2015, Safe Work Australia, GHS

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation: Remove to fresh air. Do not administer adrenaline (epinephrine). Contact physician.

Skin contact: If there is evidence of frostbite, bathe with lukewarm water. Wash skin with soap and water. Contact physician if irritation persists.

Eye contact: Flush eyes for at least 15 minutes with large amounts of water. Contact physician if irritation persists.

Ingestion: Do not induce vomiting. Contact physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

High vapor concentrations and direct contact are irritating to the eyes. Direct skin contact may cause skin irritation, frostbite and drying of the skin. Vapor in high concentrations may irritate the respiratory tract and cause drowsiness, unconsciousness, headache, dizziness and other central nervous system effects.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptoms. Do not administer adrenaline (epinephrine).

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media: Carbon dioxide, dry chemical, foam

Unsuitable extinguishing media: None known

5.2. Special hazards arising from the substance or mixture

Pressurized containers, when heated, are a potential explosive hazard.

5.3. Advice for firefighters

Cool exposed containers with water. Recommend Firefighters wear self-contained breathing apparatus.

Flammability Classification: Not determined

HAZCHEM Emergency Action Code: not applicable

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Utilize exposure controls and personal protection as specified in Section 8.

6.2. Environmental Precautions

Keep out of sewers, streams and waterways.

6.3. Methods and material for containment and cleaning up

Evacuate area. Provide adequate ventilation. Contain spill to a small area. Keep away from sources of ignition - No smoking. If removal of ignition sources is not possible, then flush material away with water. Pick up with absorbent material (sand, sawdust, clay, etc.) and place in a suitable container for disposal.
Note: If spilled, liquid will become flammable due to evaporation of part of the blend.

6.4. Reference to other sections

Refer to section 13 for disposal advice.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Do not spray on a naked flame or any incandescent material. Keep away from sources of ignition - No Smoking. Utilize exposure controls and personal protection as specified in Section 8. Vapors are heavier than air and will collect in low areas. After handling, wash before eating, drinking or smoking.

7.2. Conditions for safe storage, including any incompatibilities

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C (120°F). Do not pierce or burn, even after use.

7.3. Specific end use(s)

No special precautions.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limit values

Ingredients	OSHA PEL[1]		ACGIH TLV[2]		AUSTRALIA ES[3]	
	ppm	mg/m^3	ppm	mg/m^3	ppm	mg/m^3
1,1,1,2-Tetrafluoroethane*	–	–	–	–	1000	4240
1,1,1,3,3-Pentafluorobutane	–	–	–	–	–	–
1,1,1,3,3-Pentafluoropropane**	–	–	–	–	–	–
Isopropanol	400	980	200 STEL: 400	–	400 STEL: 500	983 STEL: 1230

*American Industrial Hygiene Association (AIHA) recommended limit: 1000 ppm, 8-hr TWA
**American Industrial Hygiene Association (AIHA) recommended limit: 300 ppm, 8-hr TWA
[1] United States Occupational Health & Safety Administration permissible exposure limits
[2] American Conference of Governmental Industrial Hygienists threshold limit values
[3] Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003]

8.2. Exposure controls

8.2.1. Engineering measures

Provide sufficient ventilation to keep the vapor concentrations below the exposure limits.

8.2.2. Individual protection measures

Respiratory protection: Not normally needed. If exposure limits are exceeded, use an approved organic vapor respirator (e.g., EN filter type A/P2).

Protective gloves: Chemical resistant gloves (e.g., natural rubber, neoprene or PVC)

Eye and face protection: Safety goggles or face shield.

Other: Impervious gloves and clothing (e.g., natural rubber, neoprene or PVC) as necessary for repetitive, prolonged contact with liquid.

8.2.3. Environmental exposure controls

Refer to sections 6 and 12.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state	clear liquid	**Odour**	ethereal
Colour	colorless	**Odour threshold**	not determined
Initial boiling point	29°C (85°F)	**Vapour pressure @ 20°C**	522 mm Hg
Melting point	not determined	**% Aromatics by weight**	none
% Volatile (by volume)	100%	**pH**	not applicable
Flash point	none	**Relative density**	1.2 kg/l
Method	PM Closed Cup	**Weight per volume**	10.0 lbs/gal.
Viscosity	< 1 cps @ 25°C	**Coefficient (water/oil)**	< 1
Autoignition temperature	580°C (1076°F)	**Vapour density (air=1)**	> 1
Decomposition temperature	not determined	**Rate of evaporation (ether=1)**	< 1
Upper/lower flammability or explosive limits	not determined	**Solubility in water**	slightly soluble
Flammability (solid, gas)	not applicable	**Oxidising properties**	not determined
Explosive properties	not determined		

9.2. Other information

None

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Refer to sections 10.3 and 10.5.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

No dangerous reactions known under conditions of normal use.

10.4. Conditions to avoid

None

10.5. Incompatible materials

Strong acids and alkalis, Alkaline and reactive metals and strong oxidizers like liquid Chlorine and concentrated Oxygen.

10.6. Hazardous decomposition products

Hydrogen Fluoride, Carbonyl Halides, Halogen acids and other toxic fumes.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Primary route of exposure under normal use: Inhalation, skin and eye contact. Personnel with eye and skin disorders, heart disease and respiratory disorders are generally aggravated by exposure.

Acute toxicity -

Oral:

Substance	Test	Result
Isopropanol	LD50 oral, rat	5045 mg/kg
Isopropanol	Human lethal dose	3570 mg/kg
1,1,1,3,3-Pentafluorobutane	LD50 oral, rat	> 2000 mg/kg

Dermal:

Substance	Test	Result
Isopropanol	LD50, rat	12800 mg/kg
1,1,1,3,3-Pentafluoropropane	LD50, rat	> 2000 mg/kg

Inhalation: Vapor in high concentrations may irritate the respiratory tract and cause drowsiness, unconsciousness, headache, dizziness and other central nervous system effects. Cardiac arrhythmia has been reported in animal studies.

Substance	Test	Result
1,1,1,2-Tetrafluoroethane	LC50 inhalation, rat	> 50000 ppm/4 hours
Isopropanol	LC50 inhalation, rat	46.5 mg/l/4 hours
1,1,1,3,3-Pentafluorobutane	LC50 inhalation, rat	> 10%/4 hours
1,1,1,3,3-Pentafluoropropane	LC50 inhalation, rat	>200000 ppm/4 hours

Skin corrosion/irritation: Direct skin contact may cause skin irritation, frostbite and drying of the skin.

Serious eye damage/ irritation: High vapor concentrations and direct contact are irritating to the eyes.

Substance	Test	Result
Isopropanol	Eye irritation	Moderate irritation

Respiratory or skin sensitisation:

Substance	Test	Result
Isopropanol	Skin sensitization, guinea pig	Not sensitizing

Germ cell mutagenicity: Isopropanol, 1,1,1,2-Tetrafluoroethane, 1,1,1,3,3-Pentafluoropropane: based on available data, the classification criteria are not met.

Carcinogenicity: As per 29 CFR 1910.1200 (Hazard Communication), this product contains no carcinogens as listed by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the Occupational Safety and Health Administration (OSHA) or Regulation (EC) No 1272/2008.

Reproductive toxicity: Isopropanol: based on available data, the classification criteria are not met.

STOT-single exposure: Isopropanol: May cause drowsiness or dizziness.

STOT-repeated exposure: Isopropanol: based on available data, the classification criteria are not met.

Aspiration hazard: Not classified as an aspiration toxicant.

Other information: None

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. The information given below is based on a knowledge of the components and the ecotoxicology of similar substances.

12.1. Toxicity

Isopropanol, 1,1,1,3,3-Pentafluorobutane: low toxicity to fish, daphnia and algae.

12.2. Persistence and degradability

Isopropanol: inherently biodegradable. 1,1,1,3,3-Pentafluorobutane: atmospheric lifetime: 16-19 years; not readily biodegradable.

12.3. Bioaccumulative potential

1,1,1,2-Tetrafluoroethane, 1,1,1,3,3-Pentafluorobutane, Isopropanol: not expected to bioaccumulate.

12.4. Mobility in soil

Liquid. Slightly soluble in water. This substance is highly volatile and will rapidly evaporate to the air if released into the environment. In determining environmental mobility, consider the product's physical and chemical properties (see Section 9). 1,1,1,3,3-Pentafluorobutane: Air, Henry's law constant (H) ca. 3.8 kPa. m^3/mol.

12.5. Other adverse effects

Contains greenhouse gases which may contribute to global warming.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Reclaim or recycle if possible. Incinerate absorbed material in an approved area. Do not incinerate sealed containers. Check local, state and national/federal regulations and comply with the most stringent requirement.

SECTION 14: TRANSPORT INFORMATION

14.1. UN number

ADR/RID/ADN/IMDG/ICAO: UN1950
TDG: UN1950
US DOT: UN1950

14.2. UN proper shipping name

ICAO:	Aerosols, Flammable
IMDG:	Aerosols
ADR/RID/ADN:	Aerosols, *flammable*
TDG:	Aerosols, *flammable*
US DOT:	Aerosols, *flammable*

14.3. Transport hazard class(es)

ADR/RID/ADN/IMDG/ICAO:	2.1
TDG:	2.1
US DOT:	2.1

14.4. Packing group

ADR/RID/ADN/IMDG/ICAO:	NOT APPLICABLE
TDG:	NOT APPLICABLE
US DOT:	NOT APPLICABLE

14.5. Environmental hazards

NO ENVIRONMENTAL HAZARDS

14.6. Special precautions for user

NO SPECIAL PRECAUTIONS FOR USER

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

NOT APPLICABLE

14.8. Other information

US DOT: Shipped as Consumer Commodity ORM-D in packaging having a rated capacity gross weight of 66 lb. or less (49 CFR 173.306(i)). ERG NO. 126

IMDG: EmS. F-D, S-U, Shipped as Limited Quantity

ADR: Classification code 5F, Tunnel restriction code (E), Shipped as Limited Quantity

SECTION 15: REGULATORY INFORMATION

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

15.1.1. National regulations

US EPA SARA TITLE III

312 Hazards:
Immediate
Pressure Release
Fire

313 Chemicals:
None

Other national regulations: National implementation of the EC Directive referred to in section 15.1.1.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms:
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE: Acute Toxicity Estimate
BCF: Bioconcentration Factor
cATpE: Converted Acute Toxicity point Estimate
ES: Exposure Standard
GHS: Globally Harmonized System
ICAO: International Civil Aviation Organization
IMDG: International Maritime Dangerous Goods
LC50: Lethal Concentration to 50 % of a test population
LD50: Lethal Dose to 50% of a test population
LOEL: Lowest Observed Effect Level
N/A: Not Applicable
NA: Not Available
NOEC: No Observed Effect Concentration
NOEL: No Observed Effect Level
OECD: Organization for Economic Co-operation and Development
(Q)SAR: Quantitative Structure-Activity Relationship
REL: Recommended Exposure Limit
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
STOT RE: Specific Target Organ Toxicity, Repeated Exposure
STOT SE: Specific Target Organ Toxicity, Single Exposure
TDG: Transportation of Dangerous Goods (Canada)
TWA: Time Weighted Average
US DOT: United States Department of Transportation
WHMIS: Workplace Hazardous Materials Information System
Other abbreviations and acronyms can be looked up at www.wikipedia.org.

Key literature references and sources for data:
Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)
Chemical Classification and Information Database (CCID)
European Chemicals Agency (ECHA) - Information on Chemicals
Hazardous Chemical Information System (HCIS)
National Institute of Technology and Evaluation (NITE)
U.S. National Library of Medicine Toxicology Data Network (TOXNET)

Procedure used to derive the classification for mixtures according to GHS:

Classification	Classification procedure
Aerosol 2, H223	On basis of test data (enclosed space ignition test)

Relevant H-statements:
H225: Highly flammable liquid and vapour.
H280: Contains gas under pressure; may explode if heated.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.

Hazard pictogram names: Flame, gas cylinder

Changes to the SDS in this revision: Section 14.

Revision date: 6 September 2017

Further information: None

This information is based solely on data provided by suppliers of the materials used, not on the mixture itself. No warranty is expressed or implied regarding the suitability of the product for the user's particular purpose. The user must make their own determination as to suitability.