

**MATERIAL SAFETY DATA SHEET**

Printed: 12/11/06

**FORANE® 404A****PRODUCT IDENTIFICATION AND USE**

MANUFACTURER: ARKEMA CANADA INC.  
700 THIRD LINE  
OAKVILLE, ONTARIO  
L6J 5A3

EMERGENCY PHONE NUMBER: (905) 827-9841 (ARKEMA)  
(613) 996-6666 (CANUTEC)

PRODUCT IDENTIFIER: FORANE® 404A  
PRODUCT CODE: AP9997  
PRODUCT USE: REFRIGERANT  
WHMIS CLASSIFICATION: A – COMPRESSED GAS  
D2B - TOXIC MATERIAL CAUSING OTHER TOXIC EFFECTS.

**HAZARDOUS INGREDIENTS**

	%W/W	CAS #	TLV
1,1,1-TRIFLUOROETHANE (HFC-143A) LD50: NA LC50: >540,000 PPM (4-HR.-INHALATION-RATS)	30-60	420-46-2	AIHA WEEL = 1000 PPM
PENTAFLUOROETHANE (HFC-125) LD50: NA LC50: >800,000 PPM (4-HR.-INHALATION RATS)	30-60	354-33-6	AIHA WEEL = 1000 PPM
1,1,1,2-TETRAFLUOROETHANE (HFC-134A) LD50: NA LC50: >500,000 PPM (4-HR.-INHALATION-RATS)	1-5	811-97-2	AIHA WEEL = 1000 PPM

ADDITIONAL INGREDIENT INFORMATION (WHMIS NOT CONTROLLED):  
NA

**PHYSICAL DATA**

PHYSICAL STATE: LIQUEFIED GAS  
ODOUR AND APPEARANCE: COLOURLESS LIQUEFIED GAS WITH FAINT ETHER ODOUR.  
ODOUR THRESHOLD: NE  
SPECIFIC GRAVITY/DENSITY (G/ML): 1.05 @ 25°C  
VAPOUR PRESSURE: (BUBBLE) 163.3 PSIA @ 21.1°C (70°F)  
VAPOUR DENSITY (AIR=1): 3.39  
VOLATILITY/VOL(%): 100  
SOLUBILITY IN H2O: NEGLIGIBLE  
EVAPORATION RATE: NE  
BOILING POINT: -47.8°C / -54°F  
FREEZING POINT: NE  
PH: NA  
LOG KOW: NE

**SHIPPING INFORMATION**

UN 3337, 2.2, REFRIGERANT GAS R 404A

**FIRE AND EXPLOSION HAZARD**

FLAMMABILITY: NA

NA - NOT APPLICABLE

NE - NOT ESTABLISHED

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CONDITIONS:	NA
MEANS OF EXTINCTION:	USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
FLASHPOINT:	NA – GAS
UPPER EXPLOSION LIMIT (% V):	NONE
LOWER EXPLOSION LIMIT (%V):	NONE
AUTO-IGNITION TEMPERATURE:	NE
HAZARDOUS COMBUSTION PRODUCTS:	HALOGENS, HALOGEN ACIDS, CARBON HALIDES
EXPLOSION DATA:	CONTAINER MAY EXPLODE IF HEATED DUE TO RESULTING PRESSURE RISE.
SENSITIVITY TO IMPACT:	NO
SENSITIVITY TO STATIC DISCHARGE:	NO

**REACTIVITY**

CHEMICAL STABILITY:	STABLE
INCOMPATIBLE MATERIALS:	STRONG ALKALINE, ALKALINE EARTH METALS, POWDERED ALUMINUM, MAGNESIUM, ZINC, STRONG OXIDIZERS.
CONDITIONS OF REACTIVITY:	NE
HAZARDOUS DECOMPOSITION PRODUCTS:	MAY DECOMPOSE ON CONTACT WITH FLAME OR EXTREMELY HOT METAL SURFACE TO PRODUCE TOXIC AND CORROSIVE PRODUCTS.

**HEALTH HAZARD INFORMATION**

ROUTE OF ENTRY	
SKIN CONTACT:	CONTACT WITH LIQUID MAY CAUSE TISSUE TO FREEZE (FROST BITE).
SKIN ABSORPTION:	NE
EYE:	VAPOUR MAY BE IRRITATING TO EYES.
INGESTION:	NA
INHALATION:	MAY BE HARMFUL. IN HIGH CONCENTRATIONS.
ACUTE OVER EXPOSURE EFFECTS:	MAY CAUSE AN INCREASE IN THE SENSITIVITY OF THE HEART TO ADRENALINE WHICH COULD RESULT IN IRREGULAR HEART BEATS AND REDUCED HEART FUNCTION.
CHRONIC OVER EXPOSURE EFFECTS:	NE
SENSITIZATION:	DOES NOT MEET WHMIS CRITERIA.
CARCINOGENICITY:	DOES NOT MEET WHMIS CRITERIA.
TERATOGENICITY:	DOES NOT MEET WHMIS CRITERIA.
MUTAGENICITY:	DOES NOT MEET WHMIS CRITERIA.
REPRODUCTIVE TOXICITY:	DOES NOT MEET WHMIS CRITERIA.

**PREVENTIVE MEASURES**

PERSONAL PROTECTIVE EQUIPMENT:	WEAR SAFETY GLASSES AND USE IMPERVIOUS GLOVES. WHERE AIRBORNE EXPOSURE IS LIKELY, WEAR A NIOSH APPROVED RESPIRATOR.
SPECIFIC ENGINEERING CONTROLS:	LOCAL EXHAUST IS RECOMMENDED.
LEAK AND SPILL PROCEDURES:	REMOVE OR EXTINGUISH IGNITION OR COMBUSTION SOURCES. KEEP UPWIND. STOP LEAK IF POSSIBLE WITH OUT RISK. DISPERSE GAS WITH FORCED AIR VENTILATION.
WASTE DISPOSAL:	HAZARDOUS WASTE. DO NOT ALLOW PRODUCT TO ENTER THE ENVIRONMENT. CONSULT FEDERAL OR LOCAL AUTHORITIES FOR APPROVED DISPOSAL

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HANDLING PROCEDURES AND EQUIPMENT: METHODS.  
KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAMES.  
WASH BEFORE EATING, DRINKING, USING TOBACCO  
PRODUCTS OR REST ROOMS.

STORAGE REQUIREMENTS: KEEP IN A CLOSED, LABELED CONTAINER IN A  
VENTILATED AREA. DO NOT STORE CYLINDER IN  
DIRECT SUN OR EXPOSE IT TO HEAT ABOVE 120°F.

**FIRST AID MEASURES**

EYE FLUSH EYES WITH LARGE AMOUNT OF WATER FOR 15 MINUTES WHILE HOLDING  
EYELIDS OPEN. SEEK MEDICAL ATTENTION IF IRRITATION OCCURS OR PERSISTS.

SKIN WASH SKIN WITH WATER AND SOAP. SEEK MEDICAL ATTENTION IF IRRITATION  
OCCURS OR PERSISTS.

INGESTION NA

INHALATION REMOVE PERSON TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, APPLY  
ARTIFICIAL RESPIRATION AND ADMINISTER OXYGEN IF NECESSARY. SEEK MEDICAL  
ATTENTION.

**PREPARATION DATE**

PREPARED BY: TECHNICAL DEPARTMENT.  
PHONE NUMBER OF PREPARER: 905-827-9841  
DATE PREPARED (MM/DD/YY): 03/10/95  
DATE REVISED (MM/DD/YY): 12/11/06

A SIGNIFICANT NEW ACTIVITY NOTICE (SNAC NOTICE) HAS BEEN ISSUED FOR 1,1,1-  
TRIFLUOROETHANE (HFC-143A). AND PENTAFLUOROETHANE (HFC-125). IT IS THE RESPONSIBILITY  
OF THE USERS OF THE SUBSTANCE TO BE AWARE OF AND COMPLY WITH THE SNAC NOTICE AND TO  
SUBMIT A SNAC NOTIFICATION TO ENVIRONMENT CANADA PRIOR TO THE COMMENCEMENT OF A  
SIGNIFICANT NEW ACTIVITY ASSOCIATED WITH THE SUBSTANCE.

MINIMUM CONTACT WITH THIS AND ALL CHEMICALS IS RECOMMENDED AS A GOOD GENERAL POLICY  
TO FOLLOW.

THE INFORMATION PRESENTED HEREIN HAS BEEN COMPILED FROM SOURCES CONSIDERED TO BE  
DEPENDABLE AND IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY  
STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF  
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SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.