SAFETY DATA SHEET

CANADA COLORS AND CHEMICALS LIMITED
152 KENNEDY ROAD SOUTH
BRAMPTON, ONTARIO, L6W 3G4
CANADA
(905) 459-1232

PRODUCT: HYDROFLUOSILICIC ACID 25%
CODE: 496000

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER........................................... CCC SULPHUR PRODUCTS
60 FIRST STREET EAST
ELMIRA, ONTARIO
N3B 2Z5

PRODUCT NAME........................................... HYDROFLUOSILICIC ACID 25%
PRODUCT CODE........................................... 496000
CHEMICAL FORMULA................................... H2SiF6.
CHEMICAL FAMILY.................................... INORGANIC ACID.
MOLECULAR WEIGHT................................... 144.09.
MATERIAL USE........................................... REFER TO TECHNICAL LITERATURE.
EMERGENCY PHONE NO........................... (416)-444-2112.

SECTION 02: HAZARDS IDENTIFICATION

SIGNAL WORD........................................... DANGER.
HAZARD CLASSIFICATION.......................... ACUTE TOXICITY (ORAL) — CATEGORY 4. ACUTE TOXICITY (DERMAL) — CATEGORY 3. SKIN CORROSION — CATEGORY 1B. SERIOUS EYE DAMAGE — CATEGORY 1.
Hazard Statement................................. H302 HARMFUL IF SWALLOWED. H311 TOXIC IN CONTACT WITH SKIN. H314 CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. H318 CAUSES SERIOUS EYE DAMAGE.
PRECAUTIONARY STATEMENT.................. P264 WASH... THOROUGHLY AFTER HANDLING. P270 DO NOT EAT, DRINK OR SMOKE WHEN USING THIS PRODUCT. P280 WEAR PROTECTIVE GLOVES/PROTECTIVE CLOTHING/EYE PROTECTION/FACE PROTECTION. P301+P330+P331 IF SWALLOWED: RINSE MOUTH. DO NOT INDUCE VOMITING. P312 CALL A POISON CENTER OR DOCTOR/PHYSICIAN IF YOU FEEL UNWELL. P302+P352 IF ON SKIN: WASH WITH PLENTY OF SOAP AND WATER. P303+P351+P338 IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES, IF PRESENT AND EASY TO DO. CONTINUE RINSING.
OTHER HAZARDS..................................... HAZARDOUS DECOMPOSITION PRODUCTS FORMED UNDER FIRE CONDITIONS. CORROSIVE. HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.

SECTION 03: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>HAZARDOUS INGREDIENTS</th>
<th>CAS #</th>
<th>WT. %</th>
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<tbody>
<tr>
<td>HYDROFLUOSILICIC ACID</td>
<td>16961-83-4</td>
<td>25</td>
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SECTION 04: FIRST AID MEASURES

GENERAL ADVICE..................................... CONSULT A PHYSICIAN. SHOW THIS SAFETY DATA SHEET TO THE DOCTOR IN ATTENDANCE. MOVE OUT OF DANGEROUS AREA.
BY ROUTE OF ENTRY.................................. MOVE TO FRESH AIR. KEEP THE VICTIM LYING DOWN. QUIET AND WARM. GET COMPETENT MEDICAL ATTENTION IMMEDIATELY. IF BREATHING HAS STOPPED, START ARTIFICIAL RESPIRATION AT ONCE. AN AUTHORIZED PERSON SHOULD...
SECTION 04: FIRST AID MEASURES

BY ROUTE OF ENTRY
ADMINISTER OXYGEN TO A VICTIM WHO IS HAVING DIFFICULTY BREATHING, UNTIL THE VICTIM IS ABLE TO BREATH EASILY BY HIMSELF. DO NOT GIVE STIMULANTS UNLESS INSTRUCTED TO DO SO BY A PHYSICIAN. VICTIM SHOULD BE EXAMINED BY A PHYSICIAN AND HELD UNDER OBSERVATION FOR AT LEAST 24 HOURS.

IN CASE OF SKIN CONTACT
REMOVE THE VICTIM FROM THE CONTAMINATED AREA AND IMMEDIATELY WASH THE BURNED AREA WITH PLENTY OF WATER FOR A MINIMUM OF 15 MINUTES. REMOVE ALL CONTAMINATED CLOTHING WHILE WASHING CONTINUOUSLY. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

IN CASE OF EYE CONTACT
IRRIGATE EYES FOR AT LEAST 15 MINUTES WITH COPIOUS AMOUNTS OF WATER, KEEPING EYELIDS APART AND AWAY FROM EYEBALLS DURING IRRIGATION. GET COMPETENT MEDICAL ATTENTION IMMEDIATELY, PREFERABLY AN EYE SPECIALIST.

IF SWALLOWED
DRINK LARGE AMOUNT OF WATER TO DILUTE. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN
ALL TREATMENT SHOULD BE BASED ON SIGNS AND SYMPTOMS OF DISTRESS IN THE PATIENT.

SECTION 05: FIRE FIGHTING MEASURES

FLAMMABILITY
NOT COMBUSTIBLE/NOT FLAMMABLE.

SUITABLE EXTINGUISHING MEDIA
USE WATER OR SUITABLE AGENTS FOR FIRES ADJACENT TO NON-LEAKING TANKS OR CONTAINERS OF HF. DO NOT USE SOLID WATER STREAMS NEAR RUPTURED TANKS OR SPILLES OF HF. ACID REACTS WITH WATER AND CAN SPLATTER ACID ONTO PERSONNEL.

HAZARDOUS COMBUSTION PRODUCTS
SEE HAZARDOUS DECOMPOSITION PRODUCTS.

EXPLOSIVE POWER
N.AV.

RATE OF BURNING
NOT APPLICABLE.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL
REACTION WITH CERTAIN METALS GENERATES FLAMMABLE AND POTENTIALLY EXPLOSIVE HYDROGEN GAS. CONSIDERABLE HEAT IS EVOLVED WHEN CONTACTED WITH MANY SUBSTANCES. HEAT INCREASES PRESSURE AND MAY EXPLODE CONTAINER. WILL REACT VIOLENTLY WITH WATER.

SPECIAL PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS APPROVED BY NIOSH AND FULL CHEMICAL PROTECTIVE CLOTHING. EVACUATE HAZARD AREA. USE WATER-SPRAY TO KEEP CONTAINERS COOL. USE WATER ON COMBUSTIBLE BURNING IN THE VICINITY OF THIS MATERIAL BUT USE CARE AS WATER APPLIED DIRECTLY TO ACID CAUSES SPATTERING OF THE ACID. DO NOT GET WATER INSIDE CONTAINER. NOTE: RUN OFF FROM FIRE CONTROL MAY BE A POLLUTION HAZARD.

SECTION 06: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS
ALWAYS WEAR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT. GOOD VENTILATION IS NECESSARY. DISCHARGE WILL ORDINARILY BE A VAPOUR OR A LIQUID THAT GIVES OFF FUMES OF HF GAS. THOSE TREATING SPILLS OR REPAIRING LEAKS MUST USE FULL PROTECTIVE EQUIPMENT. RAPID DILUTION OF THE SPILL WITH WATER TO <50% WILL REDUCE THE AMOUNT OF FUMES GIVEN OFF. CAREFULLY NEUTRALIZE THE DILUTE LIQUID WITH CAUSTIC SODA, LIME OR OTHER ALKALINE MATERIAL.

ENVIRONMENTAL PRECAUTIONS
TAKE ACTION TO MINIMIZE ENVIRONMENTAL IMPACT. TRY TO CONTAIN SPILLAGE AND AVOID DRAINAGE TO AREAS WHICH CAN NOT BE TREATED. SPILLS AND RELEASES MAY HAVE TO BE REPORTED TO FEDERAL AND/OR LOCAL AUTHORITIES. DO NOT ALLOW PRODUCT TO ENTER DRAINS.

METHODS AND MATERIALS FOR CONTAINMENT AND CLEAN UP
SOAK UP WITH INERT ABSORBENT MATERIAL AND DISPOSE OF AS HAZARDOUS WASTE. KEEP IN SUITABLE, CLOSED CONTAINERS FOR DISPOSAL.

SECTION 07: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING
ALWAYS WEAR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT. DO NOT BREATHE VAPOUR OR MIST. USE ONLY WITH ADEQUATE VENTILATION. AVOID ALL CONTACT WITH SKIN, EYES AND CLOTHING, EVEN DILUTE SOLUTIONS. DO NOT ADD WATER TO ACID. HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. EMPTY CONTAINERS MAY CONTAIN HAZARDOUS PRODUCT RESIDUES. FOLLOW LABEL WARNINGS EVEN AFTER CONTAINER IS EMTED.

CONDITIONS FOR SAFE STORAGE
STORE IN APPROVED CONTAINERS ONLY. STORE IN COOL, WELL-VENTILATED AREA. FLAMMABLE HYDROGEN GAS CAN BE GENERATED IN METAL STORAGE CONTAINERS. DIKING OF STORAGE TANKS IS RECOMMENDED.
SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
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<tr>
<td>HYDROFLUOSILICIC ACID</td>
<td>2.5 MG/M3</td>
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EXPOSURE LIMIT OF MATERIAL.............. FOR HYDROFLUORIC ACID - ACGIH - 0.5 PPM (TWA).
ENGINEERING CONTROLS.................... SUFFICIENT TO REDUCE VAPOUR AND ACID MISTS BELOW PERMISSIBLE TLV LEVELS. PACKAGING AND UNLOADING AREAS AND OPEN PROCESSING EQUIPMENT MAY REQUIRE MECHANICAL EXHAUST SYSTEMS.
SKIN AND BODY PROTECTION............... GAUNTLET GLOVES. DO NOT WEAR LEATHER SHOES.
RESPIRATORY PROTECTION................. WHERE REQUIRED, USE A RESPIRATOR APPROVED BY NIOSH FOR HF GAS OR MISTS, AS APPLICABLE. SOME EXPOSURES MAY REQUIRE NIOSH APPROVED, SELF-CONTAINED BREATHING APPARATUS OR AIR-SUPPLIED RESPIRATOR.
EYE/FACE PROTECTION.................... AS A MINIMUM WEAR HAT, CHEMICAL SAFETY GOGGLES (PLASTIC LENSES), FULL FACE PLASTIC SHIELD. DO NOT WEAR CONTACT LENSES. FOR INCREASED PROTECTION, USE AIR-SUPPLIED ACID HOOD.
FOOTWEAR/TYPES......................... CHEMICAL RESISTANT BOOTS.
CLOTHING/TYPES.......................... FOR ROUTINE PRODUCT USE, WEAR ACID-RESISTANT JACKET, TROUSERS. FOR INCREASED PROTECTION, USE AIR-SUPPLIED TOTALLY ENCAPSULATING CHEMICAL PROTECTIVE SUIT.
OTHER/TYPES............................ EYEWASH AND QUICK-DRENCH SHOWER FACILITIES, PROTECTED FROM FREEZING, SHOULD BE AVAILABLE WHERE HF IS STORED AND HANDLED.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE.......................... COLORLESS LIQUID.
ODOUR...................................... PUNGENT.
ODOUR THRESHOLD......................... N.AV.
PH.......................................... 1.0.
FREEZING POINT (C)........................ -15.5.
BOILING POINT............................ N.AV. THERMAL DECOMPOSITION.
FLASH POINT (C), METHOD................. NOT FLAMMABLE.
SPECIFIC GRAVITY (WATER=1)......... 1.27. @ 20 C.
PERCENT VOLATILE......................... NOT DETERMINED.
FLAMMABILITY (SOLIDS AND GASES)...... NOT APPLICABLE.
UPPER FLAMMABLE LIMIT (% BY VOL.)... NOT APPLICABLE.
LOWER FLAMMABLE LIMIT (% BY VOL.)... NOT APPLICABLE.
VAPOUR PRESSURE......................... 22.50 MM HG (30HPA) @ 20C.
VAPOUR DENSITY (AIR=1)............... >1 @20 C.
SPECIFIC GRAVITY (WATER=1)........ 1.27. @ 20 C.
SOLUBILITY IN WATER (% W/W)......... SOLUBLE.
COEFFICIENT OF WATER/OIL DIST....... NOT APPLICABLE.
AUTO IGNITION TEMPERATURE............. NOT AVAILABLE.
DECOMPOSITION TEMPERATURE............ N.AV.
VISCOSITY.............................. N.AV.
MOLECULAR WEIGHT...................... 144.09.

SECTION 10: STABILITY AND REACTIVITY

REACTIVITY CONDITIONS ................. RISK OF VIOLENT REACTION. RISK OF EXPLOSION.
CHEMICAL STABILITY...................... STABLE UNDER RECOMMENDED HANDLING AND STORAGE CONDITIONS. CORROSIVE IN CONTACT WITH METALS. GIVES OFF HYDROGEN BY REACTION WITH METALS. RISK OF VIOLENT REACTION. RISK OF EXPLOSION.
POSSIBILITY OF HAZARDOUS REACTIONS... REACTS VIOLENTLY WITH WATER. CORROSIVE IN CONTACT WITH METALS. GIVES OFF HYDROGEN BY REACTION WITH METALS.
CONDITIONS TO AVOID.................... TO AVOID THERMAL DECOMPOSITION, DO NOT OVERHEAT.
INCOMPATIBLE MATERIALS ............... GLASS, STRONG OXIDIZING AGENTS, METALS.
HAZARDOUS DECOMPOSITION .............. HYDROGEN GAS. HYDROGEN FLUORIDE.

SECTION 11: TOXICOLOGICAL INFORMATION

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<tr>
<th>INGREDIENTS</th>
<th>LC50</th>
<th>LD50</th>
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<tr>
<td>HYDROFLUOSILICIC ACID</td>
<td>N.AV.</td>
<td>200 MG/KG (GUINEA PIG)</td>
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ACUTE TOXICITY:
LC 50 OF MATERIAL, SPECIES & ROUTE: NO DATA.
LD 50 OF MATERIAL, SPECIES & ROUTE: 200 MG/KG (GUINEA PIG).
SECTION 11: TOXICOLOGICAL INFORMATION

SKIN CORROSION / IRRITATION: CORROSIVE.
SERIOUS EYE DAMAGE / EYE IRRITATION: STUDY SCIENTIFICALLY UNJUSTIFIED.
RESPIRATORY OR SKIN SENSITIZATION: GENOTOXICITY IN VITRO - AMES TEST (OECD 471) - NEGATIVE. GENOTOXICITY IN VIVO (SODIUM FLUORIDE BY ANALOGY) - TEST DID NOT SHOW MUTAGENIC AFFECTS.
GERM CELL MUTAGENICITY: NO CARCINOGENIC EFFECTS HAVE BEEN OBSERVED.
Carcinogenicity: THIS PRODUCT IS NOT CONSIDERED TO BE TOXIC FOR DEVELOPMENT.
Reproductive Toxicity: GENOTOXICITY IN VIVO (SODIUM FLUORIDE BY ANALOGY) - TEST DID NOT SHOW MUTAGENIC AFFECTS.
Teratogenicity: THE PRODUCT IS NOT CONSIDERED TO BE TOXIC FOR DEVELOPMENT.
STOT - SINGLE EXPOSURE: NO DATA AVAILABLE.
STOT - REPEAT EXPOSURE: NO DATA AVAILABLE.
MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: MAY AGGRAVATE AN EXISTING DERMATITIS, ASTHMA, AND INFLAMMATORY OR FIBROTIC PULMONARY DISEASE.
Inhalation: MILD EXPOSURE: CAN IRRITATE NOSE, THROAT AND RESPIRATORY SYSTEM. ONSET OF SYMPTOMS MAY BE DELAYED FOR SEVERAL HOURS. SEVERE EXPOSURE: CAN CAUSE NOSE AND THROAT BURNS, LUNG INFLAMMATION AND PULMONARY EDema (FLUID IN THE LUNGS). ALSO RESULTS IN OTHER TOXIC EFFECTS INCLUDING HYPOCALCEMIA (DEPLETION OF CALCIUM IN THE BODY) WHICH IF NOT PROMPTLY TREATED CAN RESULT IN DEATH.
INGESTION: CAN CAUSE SEVERE MOUTH, THROAT AND STOMACH BURNS AND MAY BE FATAL IF SWALLOWED.
SKIN ABSORPTION: N.AV.
IRRITANCY OF MATERIAL: CORROSIVE.
EFFECTS OF CHRONIC EXPOSURE: CHRONIC EXPOSURE MAY ENTAIL DENTAL OR SKELETAL FLUOROSIS. FLUORIDE ION CAN REDUCE SERUM CALCIUM LEVELS POSSIBLY CAUSING FATAL HYPOCALCEMIA. MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES, AND SKIN.
ADDITIONAL COMMENTS: NONE.
ADDITIONAL INFORMATION: NONE.

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE AND DEGRADABILITY: THE METHODS FOR DETERMINING THE BIOLOGICAL DEGRADABILITY ARE NOT APPLICABLE TO INORGANIC SUBSTANCES.
BIOACCUMULATIVE POTENTIAL: NO DATA AVAILABLE.
TOXICITY: NO DATA AVAILABLE.
MOBILITY IN SOIL: NO DATA AVAILABLE.
OTHER ADVERSE EFFECTS: NO DATA AVAILABLE.

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.
PRODUCT: IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS.
PACKAGING: EMPTY CONTAINERS MAY CONTAIN RESIDUE AND CAN BE DANGEROUS. DO NOT ATTEMPT TO REFILL OR CLEAN CONTAINERS WITHOUT PROPER INSTRUCTIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER: 1778.
TDG CLASSIFICATION: 8.
PACKING GROUP: II.
SPECIAL SHIPPING INSTRUCTIONS

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION: E.
HPR COMPLIANCE: THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE HPR AND THE SDS CONTAINS ALL THE INFORMATION REQUIRED BY THE HPR.

SECTION 16: OTHER INFORMATION

TSCA- LISTED ON INVENTORY
N.AV.=NOT AVAILABLE
REPAReD BY: Regulatory Affairs
PREPARATION DATE: MAR 01/2017