LTS RESEARCH LABORATORIES, INC..
MATERIAL SAFETY DATA SHEET
CADMIUM TIN

GENERAL

MANUFACTUER/SUPPLIER:	LTS RESEARCH LABORATORIES, INC.
COMPANY'S STREET:	37 RAMLAND ROAD
COMPANY'S CITY:	ORANGEBURG
COMPANY'S STATE:	NEW YORK
COMPANY'S ZIP CODE:	10962
EMERGENCY CHEMTREC #:	800-262-8200
COMPANY'S EMERGENCY TEL. #:	800-424-9300 (LOCAL) 703-527-3887 (INTERNATIONAL)
COMPANY'S TEL #:	845-494-2940
DATE MSDS PREPARED:	08/29/11

1. IDENTIFICATION

PRODUCT NAME:	CADMIUM TIN
CHEMICAL FORMULA:	CdSn
CAS#:	7440-43-9/7440-31-5
MOLECULAR WEIGHT:	231.1

2. PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT:	N/A
MELTING POINT:	N/A
VAPOR DENSITY:	N/A
VAPOR PRESSURE @ 394 ^{0}C:	N/A
% VOLATILES:	N/A
DENSITY @ 20 ^{0}C:	N/A
SOLUBILITY IN WATER:	INSOLUBLE
APPEARANCE AND ODOR:	POWDER, PIECES, SPUTTERING TARGET, ODORLESS

3. HAZARDS INDENTIFICATION

HAZARDOUS COMPONENTS %	
TIN	0-100%
OSHA/PEL:	2 mg/m3
ACGIH/TLV	2 mg/m3
Sec. 302	NO
Sec. 304	NO
Sec. 313	NO
CADMIUM	
OSHA/PEL:	0.05 mg/m^3 AS DUST & FUME
ACGIH/TLV:	0.2 mg/m^3 AS DUST AND SALTS
HAZARD DESCRIPTIONS:	T VERY TOXIC F HIGHLY FLAMMABLE Xn HARMFUL N DANGEROUS FOR THE ENVIRONMENT R 45 MAY CAUSE CANCER R 26 VERY TOXIC BY INHALATION R 11 HIGHLY FLAMMABLE R 48/23/25 ALSO TOXIC: DANGER OF SERIOUS DAMAGE TO HEALTH BY PROLONGED EXPOSIRE THROUGH INHALATION AND IF SWALLOWED R 68 POSSIBLE RISK OF IRREVERSIBLE EFFECTS R 62 POSSIBLE RISK OF IMPAIRED FERTILITY

R 50/53 VERY TOXIC TO AQUATIC ORGANISMS, MAY CAUSE LONG TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT
R 63 POSSIBLE RISK OF HARM TO UNBORN CHILD

HMIS CLASSIFICATION:

HEALTH:	2
FLAMMABILITY:	2
REACTIVITY:	1

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4. FIRE FIGHTING MEASURES

GENERAL INFORMATION: AS IN ANY FIRE, WEAR A SELF-CONTAINED BREATHING APPARATUS IN PRESSURE DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR. DUST CAN BE AN EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME. FLAMMABLE SOLID. MAY BURN RAPIDLY WITH FLARE BURNING EFFECT. MAY RE-IGNITE AFTER FIRE IS EXTINGUISHED. DANGEROUS FIRE HAZARD IN THE FORM OF DUST WHEN EXPOSE TO HEAT OR FLAME.

FLASH POINT: N/A

AUTOIGNITION TEMPERATURE: 630^{O} C (CLOUD), 430^{O} C (LAYER)

FLAMMABLE LIMITS:

UPPER:	N/A
LOWER:	N/A

EXTINGUISHING MEDIA: IF INVOLVED IN FIRE, DO NOT USE WATER, CO2 OR HALOGENATED EXTINGUISHERS. USE DRY CHEMICAL EXTINGUISHING AGENTS, GRAPHITE, SODIUM CHLORIDE, DRY SAND OR DRY GROUND DOLOMITE.
SPECIAL FIRE FIGHTING PROCEDURES:

SPECIAL FIRE FIGHTING PROCEDURES: MAY BE FLAMMABLE IN FINE POWDERED FORM. USE NORMAL FIREFIGHTING PROCEDURES WHICH INCLUDE WEARING NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS, FLAME AND CHEMICAL RESISTANT CLOTHING; HATS, BOOTS AND GLOVES. IF WITHOUT RISK, REMOVE MATERIAL FROM FIRE AREA. FUMES FROM FIRE ARE HAZARDOUS. ISOLATE RUNOFF TO PREVENT ENVIRONMENTAL POLLUTION.

UNUSUAL FIRE & EXPLOSION: VIOLENT EXPLOSIONS CAN OCCUR WHEN THE METAL IS IN CONTACT WITH FUSED AMMONIUM NITRATE OR IMMERSED IN HYDRAZOIC ACID COMBUSTIBLE IN THE FORM OF DUST WHEN EXPOSED TO HEAT OR BY SPONTANEOUS CHEMICAL REACTION WITH BR_2, BRF_3, CL_2, CLF_3, $CU(NO_3)$, K_2O_2 AND S. POWDER OXIDIZES, ESPECIALLY IN THE PRESENCE OF MOISTURE

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5. HEALTH HAZARD INFORMATIONS

EFFECTS OF EXPOSURE: TIN COMPOUNDS HAVE VARIABLE TOXICITY. ELEMENTAL TIN AND INORGANIC TIN COMPOUNDS HAVE TOXICITY AND ARE POORLY ABSORBED WHEN INGESTED. SOME INORGANIC TIN SALTS ARE IRRITATING OR CAN LIBERATE TOXIC FUMES ON DECOMPOSITION. THE LATTER IS PARTICULARLY TRUE OF TIN HALOGENS. (SAX, DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, EIGHTH EDITION.)

ACUTE EFFECTS:

INHALATION: FUMES ARE HIGHLY TOXIC AND MAY CAUSE SERIOUS SYSTEMIC POISONING AND POSSIBLE PERMANENT DAMAGE TO THE LUNGS. MAY CAUSE DEATH. MAY CAUSE IRRITATION OF THE UPPER RESPIRATORY SYSTEM, METAL FUME FEVER, THIRST, METALLIC

	TASTE, COUGHING, FEVER, CHILLS, MUSCULAR PAIN, HEADACHE, NAUSEA, VOMITING, PROFUSE SWEATING, EXCESSIVE URINATION AND DIARRHEA
INGESTION:	MAY CAUSE SALIVATION, CHOKING, NAUSEA, VOMITING, DIARRHEA, ACUTE RENAL FAILURE, CARDIOPULMONERY DEPRESSION AND DEATH.
SKIN:	CAUSES IRRITATION AND DERMATITIS.
EYE:	CAUSES IRRITATION AND CONJUNCTIVITIS.
CHRONIC EFFECTS:	
INHALATION:	MAY CAUSE LOSS OF SENSE OF SMELL, OCCASIONAL ULCERATIONS OF THE NASAL PASSAGES, RHINOLARYNGITIS, COUGH, SHORTNESS OF BREATH. DAMAGE TO THE LUNGS MAY BE IRREVERSIBLE AND THERE MAY BE INJURY TO THE KIDNEY, LIVER AND BLOOD DEATH. MAY CAUSE PNEUMONOCONIOSIS AND TIN POISONING.
INGESTION:	REPEATED OR HIGH LEVELS MAY CAUSE ABDOMINAL PAIN, NAUSEA, CONSTIPATION OR DIARRHEA, GASTRIC IRRITATION AND LOSS OF WEIGHT.
SKIN/EYES:	DERMATITIS AND IRRITATION OF THE EYES AND CONJUNCTIVITIS.
ROUTES OF ENTRY:	CONTACT WITH SKIN AND/OR EYES, INHALATION, AND INGESTION.
CARCINOGENICITY:	
NTP:	YES
IARC:	YES
NIOSH:	YES
OSHA:	NOT LISTED.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:	INDIVIDUALS WITH LUNG, LIVER, KIDNEY AND BLOOD AILMENTS SHOULD BE PRECLUDED FROM EXPOSURE UNTIL APPROVED BY A PHYSICIAN.

6. EMERGENCY AND FIRST AID PROCEDURES

INHALATION:	MOVE THE EXPOSED PERSON TO FRESH AIR AT ONCE. KEEP WARM AND AT REST. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. SEEK MEDICAL ATTENTION IMMEDIATELY AND TREAT FOR PULMONARY EDEMA.
INGESTION:	SEEK MEDICAL ATTENTION IMMEDIATELY. IF CONSCIOUS, GIVE MILK OR BEATEN EGGS EVERY FOUR HOURS TO RELIEVE GASTROINTESTINAL IRRITATION. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. VOMITING MAY OCCUR, BUT PERMANENT INJURY IS UNLIKELY. IF PERSON IS CONSCIOUS, GIVE LARGE QUANTITIES OF WATER TO DRINK AND INDUCE VOMITING. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.
SKIN:	WASH AREA WITH SOAP AND PLENTY OF WATER. SEEK MEDICAL HELP
EYE:	FLUSH WITH RUNNING WATER, INCLUDING UNDER THE EYELIDS, SEEK MEDICAL ATTENTION.

7. HANDLING AND STORAGE

HANDLING AND STORAGE:	WASH THOROUGHLY AFTER HANDLING. WASH HANDS BEFORE EATING. REMOVE CONTAMINATED CHLOTHING AND WASH BEFORE REUSE.MINIMIZIE DUST GENERATION AND ACCUMULATION. USE SPARK-PROOF TOOLS AND EXPLOSION PROOF EQUIPMENT. AVOID CONTACT WITH SKIN EYES. DO NOT BREATH DUST, VAPOR, MIST OR GAS. EMPTY CONTAINERS RETAINS RESIDUE AND CAN BE DANGEROUS. AVOID CONTACT WITH HEAT, SPARKS AND FLAME. DO NOT INGEST OR INHALE.

	HANDLE UNDER INERT ATMOSPHERE. STORE PROTECTED FROM AIR. USE ONLY IN CHEMICAL FUME HOOD. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE EMPTY CONTAINER TO HEAT, SPARK OR OPEN HEAT. STORE IN COOL, DRY, WELL-VENTILATED PLACE IN TIGHTLY CLOSED CONTAINER. KEEP AWAY FROM HEAT AND FLAME, IGNITION SOURCE AWAY FROM INCOMPATIBLE MATERIAL.

8. SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:	CONTAIN SPILL, ISOLATE HAZARD AREA AND DENY ENTRY. VENTILATE AREA OF RELEASE. AVOID MAKING FURTHER DUSTS. SCOOP OR VACUUM UP SPILL USING A HIGH EFFICIENCY PARTICULATE ABSOLUTE (HEPA) AIR FILTER AND PLACE IN A CLOSED CONTAINER FOR PROPER DISPOSAL. CADMIUM AND ITS COMPOUNDS CAN POSE A SEVERE THREAT TO THE ENVIRONMENT. WATER, SOIL, AND AIR CONTAMINATION SHOULD BE PREVENTED. USE NON-SPARKING TOOLS.
RESPIRATORY PROTECTION (SPECIFY TYPE):	HIGH EFFICIENCY PARTICULATE RESPIRATOR WITH A FULL FACEPLATE, OR SUPPLIED-AIR RESPIRATOR, OR SELF CONTAINED BREATHING APPARATUS.
VENTILATION:	LOCAL EXHAUST IS REQUIRED FOR DUST OR FUME.
PROTECTIVE GLOVES:	GENERAL LATEX TYPE FOR POWDERS
EYE PROTECTION:	ANSI APPROVED SAFETY GLASSES. WHEN WORKING WITH POWDER FORM DO NOT WEAR CONTACT LENSES
OTHER PROTECTIVE EQUIPMENT:	WEAR PROTECTIVE CLOTHING. CONTACT LENSES SHOULD NOT BE WORN WHEN AIRBORNE DUST IS PRESENT.
WASTE DISPOSAL METHOD:	RETURN SPILLED MATERIAL TO PROCESS OR DISPOSE OF MATERIAL IN ACCORDANCE WITH RCRA CFR 40 PARTS 261-265 OR LOCAL ENVIRONMENTAL REGULATIONS

9. STABILITY AND REACTIVITY

STABILITY:	STABLE NORMAL CONDITION
INCOMPATIBILITY (MATERIAL TO AVOID):	STRONG OXIDIZING AGENTS/ACIDS. REACTS EXOTHERMICALLY WITH SULFUR, SELENIUM AND TELLURIUM, METALS, CARBONATES, HYDOXIDE, REDUCING AGENTS. ACIDS, HALOGENS, BASES, CARBON TETRACHLORIDE + WATER, DISULFUR DICHLORIDE, BROMIDE, BROMINE TRIFLUORIDE, CHLORINE TRIFLUORIDE, CHLORINE, IODINE BROMIDE, COPPER (II) NITRATE, FLUORINE, IODINE HEPTAFLUORIDE, AMMONIUM NITRATE, POTASSIUM DIOXIDE, SODIUM PEROXIDE, SULFUR, TELLURIUM, MOLTEN TIN + WATER. CONCENTRATED ACIDS, OXIDANTS. FIRES AND EXPLOSIONS CAN OCCUR WHEN METALLIC TIN IS IN CONTACT WITH TURPENTINE.
HAZARDOUS DECOMPOSITION PRODUCTS:	THE HEATED METAL IN CONTACT WITH AIR FORMS HIGHLY TOXIC OXIDES OF CADMIUM. TIN OXIDES. METAL OXIDE FUME
HAZARDOUS REACTIONS;	REACTS WITH OXIDIZING AGENTS
HAZARDOUS POLYMERIZATION:	WILL NOT OCCUR.

10. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:
LD/LC50 :

ORAL (MUS) LD50:	890 mg/kg
ORAL (RAT) LD50:	2330 mg/kg
INHALATIVE:	

LC50/30M (RAT):	25 mg/m^3
PRIMARY IRRITANT TO:	SKIN, MUCUS MEMBRANE, EYE.
SUBACUTE TO CHRONIC TOXICITY:	CDMIUM AND ITS COMPOUNDS ARE HIGHLY TOXIC AND CARCINOGENIC .EFFECTS KIDNEY, LIVER, RESPIRATORY TRACT, NAUSEA, SALIVATION, VOMITING, DIARRHEA LEADING TO DEATH.
PRIMARY IRRITANT EFFECT:	
ON THE SKIN:	IRRITANT TO SKIN AND MUCOUS MEMBRANES.
ON THE EYE:	IRRITATING EFFECT.
SENSITIZATION:	NO SENSITIZING EFFECTS KNOWN.
SUBACUTE TO CHRONIC TOXICITY:	CADMIUM AND CADMIUM COMPOUNDS ARE HIGHLY TOXIC AND EXPERIMENTAL CARCINOGENS. EXPOSURE AFFECTS THE RESPIRATORY TRACT, KIDNEYS, BLADDER, URETER, BLOOD AND LIVER. INGESTION MAY CAUSE NAUSEA, SALIVATION, VOMITING AND DIARRHEA. INGESTION OR INHALATION OF CADMIUM/CADMIUM COMPOUNDS MAY BE FATAL.. IT CAUSES TESTICULAR TUMOR, EFFECTS NEW BORN.
ADDITIONAL TOXICOLOGICAL INFO:	DANGER THROUGH SKIN ABSORPTION. TO THE BEST OF OUR KNOWLEDGE, THE ACUTE AND CHRONIC TOXICITY OF THIS SUBSTANCE IS NOT FULLY KNOWN.
EPA-B1:	PROBABLE HUMAN CARCINOGEN, LIMITED EVIDENCE OF CARCINOGENICITY FROM EPIDEMIOLOGIC STUDIES.
IARC-1:	CARCINOGENIC TO HUMANS: SUFFICIENT EVIDENCE OF CARCINOGENICITY.
NTP-2:	REASONABLY ANTICIPATED TO BE A CARCINOGEN: LIMITED EVIDENCE FROM STUDIES IN HUMANS OR SUFFICIENT EVIDENCE FROM STUDIES IN EXPERIMENTAL ANIMALS. CARCINOGEN AS DEFINED BY OSHA.
ACGIH A2:	SUSPECTED HUMAN CARCINOGEN: AGENT IS CARCINOGENIC IN EXPERIMENTAL ANIMALS AT DOSE LEVELS, BY ROUTE(S) OF ADMINISTRATION, AT SITE(S), OF HISTOLOGIC TYPE(S), OR BY MECHANISM(S) CONSIDERED RELEVANT TO WORKER EXPOSURE. AVAILABLE EPIDEMIOLOGIC STUDIES ARE CONFLICTING OR INSUFFICIENT TO CONFIRM AN INCREASED RISK OF CANCER IN EXPOSED HUMANS.
	METALLIC TIN IS RELATIVELY NON-TOXIC. EXPOSURE TO DUST OR FUMES OF INORGANIC TIN SALTS IS KNOWN TO CAUSE BENIGN INFLAMMATION OF THE LUNG TISSUE, A CONDITION IN WHICH THERE IS NO DISTINCTIVE FIBROSIS, NO SIGN OF DISABILITY, NO COMPLICATING FACTORS.
CARCINOGENICITY:	NO CLASSIFICATION DATA ON CARCINOGENIC PROPERTIES OF THIS MATERIAL IS AVAILABLE FROM THE EPA, IARC, NTP.
ADDITIONAL INFORMATION:	TO THE BEST OF OUR KNOWLEDGE THE ACUTE AND CHRONIC TOXICITY OF THIS SUBSTANCE IS NOT FULLY KNOWN.

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11. TRANSPORT INFORMATION

HAZARD CLASS:	4.1
UN#	3179
PACKAGING GROUP:	II
PROPER SHIPPING NAME:	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.
LAND TRANSPORT ADR/RID:	4.1 (FT2) FLAMMABLE SOLIDS, SELF REACTIVE SUBSTANCES AND SOLID DESENSITISED EXPLOSIVES.
MARITIME TRANSPORT IMDG:	4.1
AIR TRANSPORT O ICAO/IATA	
CLASS:	4.1
LABEL:	4.1 + 6.1

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12. OTHER INFORMATION

THIS SAFETY DATA SHEET SHOULD BE USED IN CONJUNCTION WITH TECHNICAL SHEETS. IT DOES NOT REPLACE THEM. THE INFORMATION GIVEN IS BASED ON OUR KNOWLEDGE OF THIS PRODUCT, AT THE TIME OF PUBLICATION. IT IS GIVEN IN GOOD FAITH. THE ATTENTION OF THE USER IS DRAWN TO THE POSSIBLE RISKS INCURRED BY USING THE PRODUCT FOR ANY OTHER PURPOSE OTHER THAN THAT FOR WHICH IT WAS INTENDED. THIS DOES NOT IN ANY WAY EXCUSE THE USER FROM KNOWING AND APPLYING ALL THE REGULATIONS GOVERNING HIS ACTIVITY. IT IS THE SOLE RESPONSIBILITY OF THE USER TO TAKE ALL PRECAUTIONS REQUIRED IN HANDLING THE PRODUCT. THE AIM OF THE MANDATORY REGULATIONS MENTIONED IS TO HELP THE USER TO FULFILL HIS OBLIGATIONS REGARDING THE USE OF HAZARDOUS PRODUCTS.