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M A T E R I A L S A F E T Y D A T A S H E E T	
CIBA-GEIGY CORPORATION ADDITIVES DIVISION SEVEN SKYLINE DRIVE HAWTHORNE, NEW YORK 10532 (914) 785-2000	EMERGENCY PHONE NUMBER: (800) 888-8372

SECTION I-IDENTITY INFORMATION

IDENTITY (TRADE NAME): IRGANOX 1520

FAMILY/CHEMICAL NAME:

2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL

PRODUCT TYPE:

STABILIZER

IMPORTANT:

* THIS MATERIAL IS NOT INTENDED FOR USE IN PRODUCTS FOR *
* WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR ABRAD- *
* ED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS *
* SPECIFICALLY INTENDED, UNLESS THE FINISHED PRODUCT HAS *
* BEEN TESTED IN ACCORDANCE WITH THE FOOD AND DRUG ADMIN- *
* ISTRATION AND/OR OTHER APPLICABLE SAFETY TESTING RE- *
* QUIREMENTS. BECAUSE OF THE WIDE RANGE OF SUCH POTEN- *
* TIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE TO RECOM- *
* MEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR SUCH USES *
* AND ASSUMES NO LIABILITY FOR ANY SUCH USES. *

THE ABOVE DISCLAIMER HAS BEEN REVISED.

HAZARD STATEMENT :

* THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN *
* PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD *
* COMMUNICATION STANDARD 29 CFR 1910.1200. *
* THIS PRODUCT IS CONSIDERED TO BE A HAZARDOUS *
* CHEMICAL UNDER THAT STANDARD. *

SECTION II-HAZARDOUS INGREDIENTS

IRGANOX 1520

DO 085158
CONFIDENTIAL

SPECIFIC CHEMICAL NAME:

2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL

CAS #: 110553-27-0

COMMON NAME: NONE

EXPOSURE LIMITS:

OSHA PEL: NONE ESTABLISHED

ACGIH TLV: NONE ESTABLISHED

CARCINOGENICITY:

THIS CHEMICAL HAS NOT BEEN REVIEWED FOR CARCINOGENICITY
BY NTP, IARC, OR OSHA.

SECTION III-PHYSICAL DATA

APPEARANCE:

YELLOWISH OIL.

ODOR:

NOT DETERMINED.

BOILING POINT:

>178C AT 0.083 MM HG.

MELTING POINT:

14C.

EVAPORATION RATE:

NOT APPLICABLE.

PERCENT VOLATILE:

NEGLECTIBLE.

VAPOR DENSITY:

NOT APPLICABLE.

VAPOR PRESSURE:

LESS THAN OR EQUAL TO 1.5×10^{-7} AT 25C.

SOLUBILITY IN WATER:

AT 20C, < 2×10^{-5} G/L

SPECIFIC GRAVITY:

0.98 (H₂O = 1).

VISCOSITY:

87.0 MPA.S AT D = 109 S(-1)

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:

>392F.

FLAMMABLE LIMITS IN AIR-LOWER:

NOT DETERMINED.

FLAMMABLE LIMITS IN AIR-UPPER:

NOT DETERMINED.

AUTOIGNITION TEMPERATURE:

626F.

NFPA CODE:

NONE.

EXTINGUISHING MEDIA:

CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY. WATER OR
FOAM MAY CAUSE FROTHING.

FIRE FIGHTING PROCEDURES-SPECIAL:

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USE SELF-CONTAINED BREATHING APPARATUS.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE TOXIC.

SECTION V-REACTIVITY DATA

STABILITY:

STABLE.

INCOMPATIBILITY:

STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION AND BURNING MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, SULFUR OXIDES AND POSSIBLY OTHER TOXIC SPECIES.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

SECTION VI-HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE:

DERMAL.

ORAL LD50:

(RATS) >5000 MG/KG.

DERMAL LD50:

(RATS) >2000 MG/KG.

SKIN IRRITATION:

(RABBITS) NOT AN IRRITANT.

EYE IRRITATION:

(RABBITS) NOT AN IRRITANT.

SENSITIZATION:

(GUINEA PIGS) SKIN SENSITIZATION IN MAXIMIZATION TEST.(7/20 AT FIRST CHALLENGE, 1/20 AT SECOND CHALLENGE)

TERATOGENICITY:

A TERATOLOGY STUDY WAS PERFORMED WITH RATS WHICH RECEIVED ORAL DOSES OF 0, 50, 150 OR 300 MG/KG/DAY DURING DAYS 6-15 OF GESTATION. WHILE 300 MG/KG WAS SLIGHTLY TOXIC TO THE MOTHERS, THERE WERE NO SIGNIFICANT EFFECTS ON PREGNANCY OR EMBRYO/FETAL DEVELOPMENT.

MUTAGENICITY:

AMES TEST: NON-MUTAGENIC.

MICRONUCLEUS TEST: NON-MUTAGENIC.

CHINESE HAMSTER CELLS (V79): NON-MUTAGENIC

CHROMOSOME ABERRATION (CHO CELLS IN VITRO): NON-MUTAGENIC

SUBCHRONIC ORAL FEEDING STUDIES:

DURING A 28-DAY ORAL ADMINISTRATION STUDY WITH RATS, AN APPARENT FUNCTIONAL ADAPTATION OF THE LIVER OCCURRED IN ANIMALS RECEIVING 250 AND 1000 MG/KG BODY WEIGHT PER DAY. THE EFFECTS INCLUDED A LIMITED INCREASE IN LIVER WEIGHT (APPROXIMATELY 15%) AND SERUM ALKALINE PHOSPHATASE (APPROXIMATELY 30%) WITHOUT ANY SIGNS OF LIVER LESIONS. THE NO-OBSERVABLE-EFFECT-LEVEL (NOEL) FOR THESE EFFECTS WAS 50 MG/KG.

A 90-DAY ORAL GAVAGE STUDY WAS CONDUCTED IN THE RAT USING DOSES OF 0, 10, 100 AND 1000 MG/KG/DAY. EFFECTS INCLUDED HYPERSALI-

VATION AND INCREASED LIVER WEIGHT WITHOUT HISTOPATHOLOGIC CHANGES. THE NOAEL IS CONSIDERED TO BE 1000 MG/KG/DAY WITH THE NOEL EQUAL TO 10 MG/KG/DAY.

A 14-DAY RANGE-FINDING STUDY WAS CONDUCTED USING THE BEAGLE DOG. THE NOEL IS 2000 MG/KG/DAY; HIGHER DOSAGES WERE NOT USED. ORAL ADMINISTRATION OF IRGANOX 1520 TO DOGS AT DOSE LEVELS OF 10, 100 OR 1000 MG/KG/DAY FOR THIRTEEN WEEKS WAS FOUND TO CAUSE BILIARY CELL PROLIFERATION AT THE 1000 MG/KG DOSE LEVEL THAT WAS NOT REVERSED BY 4-WEEKS, POST-DOSE. A SLIGHT TO MODERATE INCREASE IN AMINOTRANSFERASES AND/OR ALKALINE PHOSPHATASE ACTIVITIES WERE RECORDED AT THE 100 AND 1000 MG/KG DOSE LEVELS. THE NO-OBSERVABLE-EFFECT LEVEL (NOEL) WAS DETERMINED TO BE 10 MG/KG.

SIGNS AND SYMPTOMS OF EXPOSURE:

MAY CAUSE SKIN SENSITIZATION WHICH COULD BE SEEN AS REDNESS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

ALLERGY, ECZEMA.

EMERGENCY AND FIRST AID PROCEDURES-EYES:

FOR EYE CONTACT, FLUSH EYES WITH PLENTY OF WATER FOR SEVERAL MINUTES. GET MEDICAL ATTENTION IF IRRITATION OCCURS.

EMERGENCY AND FIRST AID PROCEDURES-SKIN:

FOR SKIN CONTACT, WASH AFFECTED AREAS WITH PLENTY OF WATER, AND SOAP, IF AVAILABLE, FOR SEVERAL MINUTES. GET MEDICAL ATTENTION IF IRRITATION OCCURS.

EMERGENCY AND FIRST AID PROCEDURES-INGESTION:

IF SWALLOWED, GIVE AT LEAST 3-4 GLASSES OF WATER BUT DO NOT INDUCE VOMITING. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

EMERGENCY AND FIRST AID PROCEDURES-INHALATION:

IF INHALED, REMOVE FROM AREA TO FRESH AIR. GET MEDICAL ATTENTION IF RESPIRATORY IRRITATION DEVELOPS OR IF BREATHING BECOMES DIFFICULT.

EMERGENCY AND FIRST AID PROCEDURES-OTHER:

REMOVE AND WASH CONTAMINATED CLOTHING PRIOR TO REUSE.

SECTION VII-SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:

ABSORB ONTO SAND OR OTHER ABSORBENT MATERIAL. SHOVEL INTO CLOSABLE CONTAINER FOR DISPOSAL. WEAR PROTECTIVE EQUIPMENT SPECIFIED BELOW. FLUSH RESIDUE WELL WITH DETERGENT SOLUTION.

WASTE DISPOSAL METHODS:

INCINERATE IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTER-BURNER AND SCRUBBER. FOLLOW ALL FEDERAL, STATE AND LOCAL REGULATIONS.

EFFLUENT DATA-BOD:

NOT BIODEGRADABLE IN MODIFIED STURM TEST.

EFFLUENT DATA-COD:

2.66 G COD/G

SEWAGE BACTERIAL TOXICITY:

INHIBITORY CONCENTRATION ON RESPIRATION OF AEROBIC WASTE WATER BACTERIA: IC20, IC50, IC80 >100 PPM

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FISH TOXICITY:

ZEBRA FISH, ACUTE 96 HOUR LC50: >100 PPM.

INVERTEBRATE TOXICITY:

DAPHNIA MAGNA, ACUTE 24 HOUR EC50: COULD NOT BE CALCULATED;
ECO IS < 0.5 PPM AND EC100 IS >5.5 PPM.

SECTION VIII-SPECIAL PROTECTION INFORMATION

VENTILATION:

WORK IN WELL VENTILATED AREAS.

PROTECTIVE GLOVES:

WEAR IMPERVIOUS GLOVES.

EYE PROTECTION:

WEAR SAFETY GLASSES OR GOGGLES IF EYE CONTACT IS POSSIBLE.

RESPIRATORY PROTECTION:

WEAR A NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPORS TO MITIGATE
EXPOSURE SHOULD VAPORS OR AEROSOLS BE GENERATED DURING EXTRUSION
PROCESSING OPERATIONS.

OTHER PROTECTIVE EQUIPMENT:

WEAR APPROPRIATE PROTECTIVE EQUIPMENT TO AVOID PERSONAL
CONTACT AND EXPOSURE.

SECTION IX-SPECIAL PRECAUTIONS

HANDLING PRECAUTIONS:

MAY CAUSE ALLERGIC SKIN REACTIONS ON PROLONGED OR REPEATED
CONTACT.

DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. DO NOT INHALE
MISTS. USE ONLY WITH ADEQUATE VENTILATION.
FOR INDUSTRIAL USE ONLY.

SHIPPING AND STORING PRECAUTIONS:

KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING
TRANSPORT.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING,
OR USING TOBACCO PRODUCTS.

SECTION X- REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:

NOT REGULATED AS A HAZARDOUS MATERIAL BY THE U.S. DEPT. OF
TRANSPORTATION (DOT) 49 CFR 172.101 HAZARDOUS MATERIALS
TABLE.

DOT CLASS:

NONE.

DOT NUMBER:

NONE.

RCRA STATUS:

NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).

SARA/TITLE III - EHS LIST:

THIS PRODUCT DOES NOT CONTAIN AN 'EXTREMELY HAZARDOUS SUB-
STANCE' (EHS) FOR EMERGENCY PLANNING UNDER SEC. 301-303
(40 CFR 300 AND 355) AND FOR EMERGENCY RELEASE NOTIFICATION

UNDER SEC. 304.

SARA/TITLE III - CERCLA LIST:

THIS PRODUCT DOES NOT CONTAIN A 'CERCLA' LISTED HAZARDOUS SUBSTANCE FOR EMERGENCY RELEASE NOTIFICATION UNDER SEC. 304 (40 CFR 302).

SARA/TITLE III - OSHA/HCS HAZARDOUS CHEMICAL:

THIS PRODUCT IS CONSIDERED HAZARDOUS UNDER THE OSHA 'HAZARD COMMUNICATION STANDARD' (HCS) AND IS REGULATED UNDER SEC. 311-312 (40 CFR 370). ITS HAZARDS ARE:

IMMEDIATE (ACUTE) HEALTH HAZARD.

SARA/TITLE III - TOXIC CHEMICALS LIST:

THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SEC. 313 (40 CFR 372).

TSCA INVENTORY STATUS:

CHEMICAL COMPONENTS LISTED ON TSCA INVENTORY.

CALIFORNIA PROPOSITION 65:

THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS CURRENTLY ON THE CALIFORNIA LIST OF KNOWN CARCINOGENS AND REPRODUCTIVE TOXINS.

MASSACHUSETTS RIGHT-TO-KNOW ACT:

CONTAINS NO COMPONENTS ON THE MASSACHUSETTS LIST AT A THRESHOLD LEVEL.

NEW JERSEY RIGHT-TO-KNOW LABELING INFORMATION:

THIS PRODUCT CONTAINS THE FOLLOWING :

CHEMICAL NAME : 6-METHYL-2,4-BIS((OCTYLTHIO)METHYL)-PHENOL
CAS NUMBER : 110553-27-0

* * *

CHEMICAL NAME : 2-METHYL-6-((OCTYLTHIO)METHYL)-PHENOL
CAS NUMBER : NONE
PERCENT : IMPURITY

* * *

PENNSYLVANIA RIGHT-TO-KNOW ACT:

THE FOLLOWING IS REQUIRED COMPOSITION INFORMATION.

CHEMICAL NAME : 2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL
CAS NUMBER : 110553-27-0
COMMON NAME : NONE
COMMENTS : NOT ON PENNSYLVANIA HAZARDOUS SUBSTANCE LIST.

* * *

ISSUE DATE: 04/22/91 REVISION: 08C

FOR FURTHER INFORMATION, PLEASE CONTACT: BRUCE SCHWEMMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH RESPECT TO THE INFORMATION CONTAINED HEREIN.

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M A T E R I A L S A F E T Y D A T A S H E E T

CIBA-GEIGY CORPORATION
ADDITIVES DIVISION
SEVEN SKYLINE DRIVE
HAWTHORNE, NEW YORK 10532
(914) 347-4700

EMERGENCY PHONE NUMBER:

(800) 888-8372

SECTION I-IDENTITY INFORMATION

IDENTITY (TRADE NAME): IRGANOX 1520

FAMILY/CHEMICAL NAME:
2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL
PRODUCT TYPE:
STABILIZER
IMPORTANT:

PLEASE NOTE: REVISION 06 - SECTIONS VI, IX REVISED.

* THIS MATERIAL WILL NOT BE SOLD FOR USE IN PRODUCTS *
* FOR WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR *
* ABRADED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS *
* SPECIFICALLY INTENDED. BECAUSE OF THE WIDE RANGE OF *
* SUCH POTENTIAL USES, CIBA-GEIGY CORPORATION IS NOT ABLE *
* TO RECOMMEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR *
* SUCH USES AND ASSUMES NO LIABILITY FOR ANY SUCH USES. *

HAZARD STATEMENT :

* THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN *
* PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD *
* COMMUNICATION STANDARD 29 CFR 1910.1200. *
* THIS PRODUCT IS CONSIDERED TO BE A HAZARDOUS *
* CHEMICAL UNDER THAT STANDARD. *

SECTION II-HAZARDOUS INGREDIENTS

SPECIFIC CHEMICAL NAME:
2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL
CAS #: 110553-27-0

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COMMON NAME: NONE
EXPOSURE LIMITS:
OSHA PEL: NONE ESTABLISHED
ACGIH TLV: NONE ESTABLISHED
CARCINOGENICITY:
THIS CHEMICAL HAS NOT BEEN REVIEWED FOR CARCINOGENICITY
BY NTP, IARC, OR OSHA.

SECTION III-PHYSICAL DATA

APPEARANCE:
YELLOWISH OIL.
ODOR:
NOT DETERMINED.
BOILING POINT:
>178C AT 0.083 MM HG.
MELTING POINT:
14C.
EVAPORATION RATE:
NOT APPLICABLE.
PERCENT VOLATILE:
NEGLEGIBLE.
VAPOR DENSITY:
NOT APPLICABLE.
VAPOR PRESSURE:
LESS THAN OR EQUAL TO $1.5 \times 10(-7)$ AT 25C.
SOLUBILITY IN WATER:
AT 20C, < $2 \times 10(-5)$ G/L
SPECIFIC GRAVITY:
0.98 (H₂O = 1).
VISCOSITY:
87.0 MPAS AT D = 109 S(-1)

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:
>392F.
FLAMMABLE LIMITS IN AIR-LOWER:
NOT DETERMINED.
FLAMMABLE LIMITS IN AIR-UPPER:
NOT DETERMINED.
AUTOIGNITION TEMPERATURE:
626F.
NFPA CODE:
NONE.
EXTINGUISHING MEDIA:
CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY. WATER OR
FOAM MAY CAUSE FROTHING.
FIRE FIGHTING PROCEDURES-SPECIAL:
USE SELF-CONTAINED BREATHING APPARATUS.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE TOXIC.

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SECTION V-REACTIVITY DATA

STABILITY:

STABLE.

INCOMPATIBILITY:

STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION AND BURNING MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE, SULFUR OXIDES AND POSSIBLY OTHER TOXIC SPECIES.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

SECTION VI-HEALTH HAZARD DATA

PRIMARY ROUTES OF EXPOSURE:

DERMAL.

ORAL LD50:

(RATS) >5000 MG/KG.

DERMAL LD50:

(RATS) >2000 MG/KG.

SKIN IRRITATION:

(RABBITS) NOT AN IRRITANT.

EYE IRRITATION:

(RABBITS) NOT AN IRRITANT.

SENSITIZATION:

(GUINEA PIGS) SKIN SENSITIZATION IN MAXIMIZATION TEST.(7/20 AT FIRST CHALLENGE, 1/20 AT SECOND CHALLENGE)

TERATOGENICITY:

A TERATOLOGY STUDY WAS PERFORMED WITH RATS WHICH RECEIVED ORAL DOSES OF 0, 50, 150 OR 300 MG/KG/DAY DURING DAYS 6-15 OF GESTATION. WHILE 300 MG/KG WAS SLIGHTLY TOXIC TO THE MOTHERS, THERE WERE NO SIGNIFICANT EFFECTS ON PREGNANCY OR EMBRYO/FETAL DEVELOPMENT.

MUTAGENICITY:

AMES TEST: NON-MUTAGENIC.

MICRONUCLEUS TEST: NON-MUTAGENIC.

CHINESE HAMSTER CELLS (V79): NON-MUTAGENIC

SUBCHRONIC ORAL FEEDING STUDIES:

DURING A 28-DAY ORAL ADMINISTRATION STUDY WITH RATS, AN APPARENT FUNCTIONAL ADAPTATION OF THE LIVER OCCURRED IN ANIMALS RECEIVING 250 AND 1000 MG/KG BODY WEIGHT PER DAY. THE EFFECTS INCLUDED A LIMITED INCREASE IN LIVER WEIGHT (APPROXIMATELY 15%) AND SERUM ALKALINE PHOSPHATASE (APPROXIMATELY 30%) WITHOUT ANY SIGNS OF LIVER LESIONS. THE NO-OBSERVABLE-EFFECT-LEVEL (NOEL) FOR THESE EFFECTS WAS 50 MG/KG.

A 90-DAY ORAL GAVAGE STUDY WAS CONDUCTED IN THE RAT USING DOSES OF 0, 10, 100 AND 1000 MG/KG/DAY. EFFECTS INCLUDED HYPERSALIVATION AND INCREASED LIVER WEIGHT WITHOUT HISTOPATHOLOGIC CHANGES. THE NOEL IS CONSIDERED TO BE 1000 MG/KG/DAY WITH THE NOEL EQUAL TO 10 MG/KG/DAY.

A 14-DAY RANGE-FINDING STUDY WAS CONDUCTED USING THE BEAGLE

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DOG. THE NOEL IS 2000 MG/KG/DAY; HIGHER DOSAGES WERE NOT USED.
SIGNS AND SYMPTOMS OF EXPOSURE:
MAY CAUSE SKIN SENSITIZATION WHICH COULD BE SEEN AS REDNESS.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
ALLERGY, ECZEMA.
EMERGENCY AND FIRST AID PROCEDURES-EYES:
FLUSH EYES WITH WATER FOR 15 MINUTES WHILE HOLDING
EYELIDS OPEN. GET MEDICAL ATTENTION.
EMERGENCY AND FIRST AID PROCEDURES-SKIN:
WASH WITH MILD SOAP AND WATER. IF IRRITATION OCCURS, GET
MEDICAL ATTENTION.
EMERGENCY AND FIRST AID PROCEDURES-INGESTION:
IF CONSCIOUS, GIVE LARGE QUANTITIES OF WATER. GET
MEDICAL ATTENTION.
EMERGENCY AND FIRST AID PROCEDURES-INHALATION:
REMOVE TO FRESH AIR.
EMERGENCY AND FIRST AID PROCEDURES-OTHER:
REMOVE AND WASH CONTAMINATED CLOTHING PRIOR TO REUSE.

SECTION VII-SPILL OR LEAK PROCEDURES

SPILL PROCEDURES:
ABSORB ONTO SAND OR OTHER ABSORBENT MATERIAL. SHOVEL INTO
CLOSABLE CONTAINER FOR DISPOSAL. WEAR PROTECTIVE EQUIPMENT
SPECIFIED BELOW. FLUSH RESIDUE WELL WITH DETERGENT
SOLUTION.
WASTE DISPOSAL METHODS:
INCINERATE IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTER-
BURNER AND SCRUBBER. FOLLOW ALL FEDERAL, STATE AND LOCAL
REGULATIONS.
EFFLUENT DATA-BOD:
NOT BIODEGRADABLE IN MODIFIED STURM TEST.
EFFLUENT DATA-COD:
2.66 G COD/G
SEWAGE BACTERIAL TOXICITY:
INHIBITORY CONCENTRATION ON RESPIRATION OF AEROBIC WASTE WATER
BACTERIA: IC20, IC50, IC80 >100 PPM
FISH TOXICITY:
ZEBRA FISH, ACUTE 96 HOUR LC50: >100 PPM.
INVERTEBRATE TOXICITY:
DAPHNIA MAGNA, ACUTE 24 HOUR EC50: COULD NOT BE CALCULATED;
ECO IS < 0.5 PPM AND EC100 IS >5.5 PPM.

SECTION VIII-SPECIAL PROTECTION INFORMATION

VENTILATION:
WORK IN WELL VENTILATED AREAS.
PROTECTIVE GLOVES:
WEAR IMPERVIOUS GLOVES.
EYE PROTECTION:
WEAR SAFETY GLASSES OR GOGGLES IF EYE CONTACT IS POSSIBLE.
RESPIRATORY PROTECTION:
WEAR A NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPORS TO MITIGATE

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EXPOSURE SHOULD VAPORS OR AEROSOLS BE GENERATED DURING EXTRUSION PROCESSING OPERATIONS.
OTHER PROTECTIVE EQUIPMENT:
WEAR APPROPRIATE PROTECTIVE EQUIPMENT TO AVOID PERSONAL CONTACT AND EXPOSURE.

SECTION IX-SPECIAL PRECAUTIONS

HANDLING PRECAUTIONS:

MAY CAUSE ALLERGIC SKIN REACTIONS ON PROLONGED OR REPEATED CONTACT.

DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. DO NOT INHALE MISTS. USE ONLY WITH ADEQUATE VENTILATION.
FOR INDUSTRIAL USE ONLY.

SHIPPING AND STORING PRECAUTIONS:

KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING TRANSPORT.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING, OR USING TOBACCO PRODUCTS.

SECTION X- REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:

NOT REGULATED AS A HAZARDOUS MATERIAL BY THE U.S. DEPT. OF TRANSPORTATION (DOT) 49 CFR 172.101 HAZARDOUS MATERIALS TABLE.

DOT CLASS:

NONE.

DOT NUMBER:

NONE.

RCRA STATUS:

NOT A HAZARDOUS WASTE UNDER RCRA (40 CFR 261).

SARA/TITLE III - EHS LIST:

THIS PRODUCT DOES NOT CONTAIN AN 'EXTREMELY HAZARDOUS SUBSTANCE' (EHS) FOR EMERGENCY PLANNING UNDER SEC. 301-303 (40 CFR 300 AND 355) AND FOR EMERGENCY RELEASE NOTIFICATION UNDER SEC. 304.

SARA/TITLE III - CERCLA LIST:

THIS PRODUCT DOES NOT CONTAIN A 'CERCLA' LISTED HAZARDOUS SUBSTANCE FOR EMERGENCY RELEASE NOTIFICATION UNDER SEC. 304 (40 CFR 302).

SARA/TITLE III - OSHA/HCS HAZARDOUS CHEMICAL:

THIS PRODUCT IS CONSIDERED HAZARDOUS UNDER THE OSHA 'HAZARD COMMUNICATION STANDARD' (HCS) AND IS REGULATED UNDER SEC. 311-312 (40 CFR 370). ITS HAZARDS ARE:

IMMEDIATE (ACUTE) HEALTH HAZARD.

SARA/TITLE III - TOXIC CHEMICALS LIST:

THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SEC. 313 (40 CFR 372).

TSCA INVENTORY STATUS:

CHEMICAL COMPONENTS LISTED ON TSCA INVENTORY.

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DO 085168
CONFIDENTIAL

CALIFORNIA PROPOSITION 65:

THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS CURRENTLY ON
THE CALIFORNIA LIST OF KNOWN CARCINOGENS AND REPRODUCTIVE
TOXINS.

MASSACHUSETTS RIGHT-TO-KNOW ACT:

CONTAINS NO COMPONENTS ON THE MASSACHUSETTS LIST AT A
THRESHOLD LEVEL.

NEW JERSEY RIGHT-TO-KNOW LABELING INFORMATION:

THIS PRODUCT CONTAINS THE FOLLOWING :

CHEMICAL NAME : 6-METHYL-2,4-BIS((OCTYLTHIO)METHYL)-PHENOL
CAS NUMBER : 110553-27-0

* * *

CHEMICAL NAME : 2-METHYL-6-((OCTYLTHIO)METHYL)-PHENOL
CAS NUMBER : NONE
PERCENT : IMPURITY

* * *

PENNSYLVANIA RIGHT-TO-KNOW ACT:

THE FOLLOWING IS REQUIRED COMPOSITION INFORMATION.

CHEMICAL NAME : 2-METHYL-4,6-BIS((OCTYLTHIO)METHYL)PHENOL
CAS NUMBER : 110553-27-0
COMMON NAME : NONE
COMMENTS : NOT ON PENNSYLVANIA HAZARDOUS SUBSTANCE LIST.

* * *

ISSUE DATE: 06/15/90 REVISION: 06C

FOR FURTHER INFORMATION, PLEASE CONTACT: BRUCE SCHWEMMER

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE
BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE
OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH
RESPECT TO THE INFORMATION CONTAINED HEREIN.

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AC-10 ASPHALT

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 10/18/88
SUPERSEDES DATE: 03/02/88

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
AC-10 ASPHALT

PRODUCT CODE
171520 - 07152

CHEMICAL NAME
Petroleum Asphalt

CAS NUMBER
8052-42-4

PRODUCT APPEARANCE AND ODOR
Semi-solid when cold, viscous fluid when hot; black color
Characteristic asphaltic odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

90

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
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Asphalt	8052-42-4	100%
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See Section E for Health and Hazard Information.

See Section H for additional Environmental Information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health Flammability Reactivity BASIS
1 1 0 Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT

5 mg/m3 for oil mist in air BASIS
OSHA Regulation 29 CFR 1910.1000

5 mg/m3 for oil mist or fumes Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)
(10 mg/m3 STEL)

5 mg/m3 for mist in air Recommended by Exxon

The American Conference of Governmental Industrial Hygienists (ACGIH) has adopted a Threshold Limit Value for hydrogen sulfide (H₂S) of 10 ppm in air as a time-weighted average for an 8-hour workday with a 15 ppm (21 mg/m³) STEL. OSHA Regulation 29 CFR 1910.1000 further lists a ceiling concentration of 20 ppm, and a maximum peak of 50 ppm for 10 minutes once per day if no other measurable exposure occurs. NIOSH-approved respiratory equipment should be used when permissible concentrations are exceeded.

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

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EYE CONTACT

If hot product is splashed into eyes, flush with clear water and contact physician immediately.

SKIN

If skin is contaminated with cold, solid asphalt, the contaminated area should be cleaned with waterless skin cleanser followed by soap and water.

If skin is contacted with hot asphalt, thermal burns will result. In this case, the contaminated

area should be treated similar to other thermal burns by cooling the affected area immediately with coolest available water. It is not usually advisable to immediately remove the asphalt material. Natural separation will occur in 48-72 hours. Removal should be attempted only under the direction of a physician. If removal is attempted, mineral oil (not mineral spirits) or mineral oil ointment may be applied to soften the asphalt to facilitate removal.

INHALATION

If overcome by H₂S, immediately remove to fresh air and call a physician. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)

218°C (425°F)

ASTM D 92, Cleveland Open Cup

AUTOIGNITION TEMPERATURE

Greater than 260°C (500°F)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health Flammability Reactivity BASIS

0

1

0

Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS

Use product with caution around heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

HOT ASPHALT FLASH WARNING

Studies have shown that relatively low flash point substances, such as hydrogen sulfide and low-boiling hydrocarbons, may accumulate in the vapor space of hot asphalt tanks and bulk transport compartments. Such vapors may exhibit flammability characteristics of a significantly lower flash product than would be indicated by the open cup flash test. As a precaution, keep ignition sources away from vents and openings, including prevention of accumulation of pyrophoric iron sulfide. Asphalt Institute Publication IS-180 and American Petroleum Institute Publication 852-20230 contain further information and guidance on the safe storage and handling of hot asphalt.

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, hydrogen sulfide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

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E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Inhalation of high vapor concentrations may cause eye and respiratory irritation, headaches, dizziness or nausea, unconsciousness and possibly death. Prolonged or repeated contact with product at warm or near ambient temperature may cause skin irritation. CAUTION: Product normally shipped hot (approximately 225-350°F).

NATURE OF HAZARD AND TOXICITY INFORMATION

Skin contact with hot product may cause thermal burns. Prolonged or repeated contact with this product at warm or ambient temperatures may cause skin irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Eye contact with hot product may cause thermal burns. Contact with this product at warm or ambient temperatures may cause eye irritation but will not damage eye tissue.

CAUTION: Under certain circumstances sulfur compounds in hot product may form hydrogen sulfide (H₂S) gas. Cooling product may continue to emit traces of H₂S temporarily from entrapped or dissolved gases. H₂S is a colorless, toxic and extremely flammable gas with an odor at low concentrations characteristic of rotten eggs and a sweetish odor at high concentrations. Odor cannot be relied upon as a means of detection because the sense of smell rapidly becomes insensitive to H₂S, and the H₂S odor may be masked by the general odor of hot product. Because H₂S may accumulate in tanks and bulk transport compartments, personnel should stand upwind, keep their faces at least two feet from compartment openings, and avoid breathing vapors when opening hatches and dome covers. (In a large number of tests, permissible concentrations in the breathing zone were not exceeded by following this procedure.)

Prolonged breathing of 50 to 100 ppm of H₂S may produce eye and respiratory tract irritation, headache, nervousness and nausea, and only a few breaths of high concentrations (e.g. 700 to 1000 ppm) may lead to unconsciousness and could be fatal. To avoid possible inhalation toxicity, the American Conference of Governmental Industrial Hygienists (ACGIH) has adopted a Threshold Limit Value for H₂S of 10 ppm in air as time-weighted average for an 8-hour workday. OSHA Regulation 29 CFR 1910.1000 further lists a ceiling concentration of 20 ppm, and a maximum peak of 50 ppm for 10 minutes once per day if no other measurable exposure occurs. NIOSH-approved respiratory equipment should be used when permissible concentrations are exceeded.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD₅₀ (rat) greater than 5 g/kg of body weight, and an acute dermal LD₅₀ (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

None Recognized

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE

IBP Approximately 480°C (900°F)

VAPOR PRESSURE

Less than 0.1 mm Hg @ 20°C

SPECIFIC GRAVITY (15.6 C/15.6 C)

1.05

VAPOR DENSITY (AIR = 1)

Greater than 5

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AC-10 ASPHALT

MOLECULAR WEIGHT

Not determined

PERCENT VOLATILE BY VOLUME

Negligible from open container
in 4 hours @ 38°C (100°F)

PH

Essentially neutral

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)

(n-BUTYL ACETATE = 1)
Less than 0.01

POUR, CONGEALING OR MELTING POINT

Not available

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)

Negligible; less than 0.1%

VISCOSITY

Minimum 800 Poise @ 60°C

G. REACTIVITY

This product is stable. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite. Hot product in contact with water can cause foaming or sudden evolution of steam which could cause pressure build-up and possibly rupture a tank or vessel.

Hydrogen sulfide from the product can react with the iron in an asphalt storage tank to form ferrous sulfide which is pyrophoric.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Recover free product. Add sand, earth, or other suitable absorbent to spill area. Minimize skin contact. Hot product will solidify when cooled. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers or watercourses.

Assure conformity with applicable governmental regulations.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)

Not applicable

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 385 (SARA Sections 301-304)

Not applicable

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Sections 311-313)

Not applicable

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable XXX

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use local exhaust to capture vapor, mists or fumes when handling hot product, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed, or when H2S exceeds permissible limits.

PROTECTIVE GLOVES

Protect against hot liquid. Use chemical-resistant gloves to avoid skin contact.

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EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to protect against hot liquid and to avoid skin contact.

WORK PRACTICES / ENGINEERING CONTROLS

Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

PERSONAL HYGIENE

Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION

TRANSPORTATION INCIDENT INFORMATION

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER

Not applicable

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, the following OSHA Hazard Warnings should be found on a label, bill of lading or invoice accompanying this shipment.

CAUTION!

MAY FORM HYDROGEN SULFIDE (H₂S) WHEN HEATED
 INHALATION OF H₂S MAY BE FATAL
 HOT PRODUCT MAY CAUSE THERMAL BURNS

Note: Product label will contain additional non-OSHA related information.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal council should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH
 EFFECTS CONTACT:

FOR OTHER PRODUCT INFORMATION CONTACT:

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AC-10 ASPHALT

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