SECTION I: IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

GHS PRODUCT IDENTIFIER
NAME
HIKOTACK P-110S
CHEMICAL FAMILY
PETROLEUM HYDROCARBON RESIN
CAS NUMBER
64742-16-1

RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE:
RECOMMENDED USE
ADDITIVE FOR ADHESIVES, PAINTS, COATINGS, INKS
RESTRICTIONS ON USE
USED FOR RECOMMENDED USE.

MANUFACTURER/IMPORTER/SUPPLIER INFORMATION
SUPPLIER NAME
KOLON INDUSTRIES
ADDRESS
15TH FL, KOLON TOWER, KOLON-RO 11,
GWACHEON-CITY, GYEONGGO-DO, KOREA(427-709)
TELEPHONE / FAX
(82) 2 3677 6124 / (82) 2 3677 6191

SECTION 2: HAZARDS IDENTIFICATION

CLASSIFICATION
ANNEX I OF DIRECTIVE 67/548/EEC
NOT CLASSIFIED
EU CLP 2008
NOT CLASSIFIED
NFPA
HEALTH = 1  FIRE = 1  REACTIVITY = 0 (0 = NO HAZARD, 1 = SLIGHT HAZARD)
SECTION 3: COMPOSITION, INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS NUMBER</th>
<th>Weight % Range</th>
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</thead>
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<tr>
<td>PETROLEUM HYDROCARBON RESIN</td>
<td>64742-16-1</td>
<td>100</td>
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</tbody>
</table>

SECTION 4: FIRST AID MEASURES

EYE CONTACT
FLUSH EYES WITH AMOUNT OF WATER FOR AT LEAST 15 MINUTES.
GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT
GET MEDICAL ATTENTION IF NEEDED.
DRY AND WASH THOROUGHLY CONTAMINATED CLOTHING AND SHOES BEFORE REUSE.
REMOVE CONTAMINATED CLOTHING AND SHOES. WASH IMMEDIATELY SKIN WITH SOAP AND WATER FOR AT LEAST 15 MINUTES.

INHALATION
GIVE ARTIFICIAL RESPIRATION IF VICTIM IS NOT BREATHING.
MOVE VICTIM TO NON-CONTAMINATED PLACE IF SIDE EFFECT OCCURRED.
GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION
GET MEDICAL ATTENTION IF SWALLOWED AMOUNT OF SUBSTANCE.

OTHER NOTES FOR PHYSICIAN
THERE IS NOT SPECIFIC ANTIDOTE. TAKE FUNCTIONALLY MEASURES ACCORDING TO SYMPTOMS.

SECTION 5: FIRE FIGHTING MEASURES

SUITABLE (AND UNSUITABLE) EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA
DRY CHEMICAL, CO₂, WATER SPRAY, REFULAR FOAM

UNSUITABLE EXTINGUISHING MEDIA
NOT AVAILABLE

IN CASE OF MAJOR FIRE AND LARGE QUANTITIES
USE REGULAR EXTINGUISHING AGENT AND FINE WATER SPRAY.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL

THERMAL DECOMPOSITION PRODUCTS
CARBON OXIDES

FIRE AND EXPLOSIVE HAZARD
IT COULD BE A SLIGHT FIRE HAZARD.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE-FIGHTERS
MOVE CONTAINERS FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK.
DO NOT SCATTER SPILLED MATERIAL WITH HIGH PRESSURE WATER STREAMS.
MAKE AN EMBANKMENT FOR FURTHER PROCESSING.
USE EXTINGUISHING AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE.
AVOID INHALATION OF THE SUBSTANCE OR COMBUSTION PRODUCTS.
STAY UPWIND AND KEEP OUT OF LOW AREAS.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES
KEEP AWAY FROM WATERWAYS AND SEWERS.
ISOLATE EXPOSED AREA.
KEEP UNAUTHORIZED PERSONNEL AWAY.
MOVE MATERIALS TO SUITABLE CONTAINERS FOR LATER DISPOSAL.

ENVIRONMENTAL PRECAUTIONS AND PROTECTIVE PROCEDURES

ATMOSPHERE
NOT AVAILABLE

LAND
NOT AVAILABLE

UNDERWATER
DO NOT RELEASE SPILLAGE INTO SEWERS.

THE METHODS OF PURIFICATION AND REMOVAL

SMALL SPILL
DISPOSE WASTE AS WASTE SYNTHESIS RESIN (GENERAL WASTE).

LARGE SPILL
COLLECT AND THEN RECYCLE OR DISPOSE AS A WASTE RESIN (GENERAL WASTE).

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING
PREVENT SKIN AND EYE CONTACT
AVOID CONTACT IN THE MOLTEN STATE BY HEAT AND VAPOR INHALATION.
WHEN STATIC ELECTRICITY GENERATES, REMOVE BY GROUNDING, CLEANING WORK SPACE, AND USING ARTICLES PREVENTING ELECTRIFICATION.

CONDITIONS FOR SAFE STORAGE
MINIMIZE GENERATION AND ACCUMULATION OF DUST
STORE IN A COOL, DRY AND WELL-VENTILATED AREA.
AVOID CONTACT WITH STRAIGHT SUNLIGHT.
STORE AND USE BY REGULATION OF CENTRAL GOVERNMENT AND LOCAL SELF-GOVERNMENT.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS
OSHA
TWA - 5 mg/m³ (RESPIRABLE DUST FRACTION)

BIOLOGICAL EXPOSURE INDEX
NOT AVAILABLE
KOREAN OCCUPATION OF SAFETY AND HEALTH REGULATION
NOT AVAILABLE

APPROPRIATE ENGINEERING CONTROLS
PROVIDE LOCAL EXHAUST VENTILATION SYSTEM OR OTHER ENGINEERING CONTROLS TO KEEP THE AIRBORNE CONCENTRATIONS OF VAPOR BELOW THEIR RESPECTIVE THRESHOLD LIMIT VALUE.
CHECK LEGAL SUITABILITY OF EXPOSURE LEVEL.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATOR
WEAR NIOSH OR EUROPEAN STANDARD EN 149 APPROVED FULL OR HALF FACE PIECE(WITH GOGGLES) RESPIRATORY PROTECTIVE EQUIPMENT WHEN NECESSARY.
AIR RESPIRATOR ARE REQUIRED IN CASE OF HIGH FREQUENCY USE OR SEVERE EXPOSURE
AIR-PURIFYING RESPIRATOR(HIGH EFFICIENCY PARTITULATE ABSORBER) IN CASE OF UNKNOWN CONCENTRATIONS OR URGENT RISK OF LIFE/HEALTH AIR-LINE MASK(COMBINATION AIRLINE BREATHING MASK)
AIR-BREATHING APPARAUSET(FULL FACEPIECE)

EYE PROTECTION
WEAR SAFETY GLASSES(GOGGLES) TO PROTECT EYES FROM DUST.

HAND PROTECTION
WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT EXPOSURE OF SKIN.

BODY PROTECTION
WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT EXPOSURE OF SKIN.

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

STATE
SOLID

COLOR
YELLOW

ODOR
PETROCHEMICAL ODOR

ODOR THRESHOLD
NOT AVAILABLE

Ph
NOT AVAILABLE

MELTING POINT/FREEZING POINT
107~113℃ (SOFTENING POINT)

INITIAL BOILING POINT AND BOILING RANGE
NOT AVAILABLE

FLASH POINT
>270℃

EVAPORATION RATE
NOT APPLICABLE
FLAMMABILITY (SOLID, GAS)
NOT AVAILABLE

UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS
NOT AVAILABLE
(DUST EXPLOSIVENESS : MINIMUM COMPLEXING ENERGy(M.I.E TEST) 3~5mJ)

VAPOR PRESSURE
NOT APPLICABLE

SOLUBILITY (ies)
INSOLUBLE

VAPOR DENSITY
NOT APPLICABLE

SPECIFIC GRAVITY
1.05~1.10

PARTITION COEFFICIENT (n-OCTANOL/WATER)
NOT APPLICABLE

AUTO IGNITION TEMPERATURE
NOT AVAILABLE

DECOMPOSITION TEMPERATURE
NOT AVAILABLE

VISCOSITY
110 cps (200℃)

MOLECULAR WEIGHT
APPROX. 1400 (Mw)

SECTION 10 : STABILITY AND REACTIVITY

CHEMICAL STABILITY AND POSSIBILITY OF HAZARDOUS REACTIONS
STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.
IT WILL NOT OCCUR POLYMERIZATION REACTION.

CONDITION TO AVOID
AVOID HEAT, FLAMES, SPARKS AND OTHER SOURCES OF IGNITION.

INCOMPATIBLE MATERIALS
STRONG OXIDIZING AGENT

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON OXIDES

SECTION 11 : TOXICOLOGICAL INFORMATION

INFORMATION ON THE LIKELY ROUTES OF EXPOSURE
VAPOR BY POLYMERIZATION OR DECOMPOSITION MAY CAUSE IRRITATION
OF EYES, SKIN, THROAT AND LUNG.

INFORMATION OF HEALTH HAZARDOUS
ACUTE TOXICITY
ORAL : NOT CLASSIFIED (LD50 = 7,000mg/kg(RAT))
DERMAL : NOT CLASSIFIED (NOT AVAILABLE)
INHALATION (DUST/MIST) : NOT CLASSIFIED (NOT AVAILABLE)
SKIN CORROSION/IRRITATION
NOT CLASSIFIED
SKIN IRRITATION TEST : NOT IRRITATIVE BASED ON PRIMARY IRRITATION INDEX = 0)
SERIOUS EYE DAMAGE/IRRITATION
NOT CLASSIFIED (NOT AVAILABLE)
RESPIRATORY SENSITIZER
NOT AVAILABLE
SKIN SENSITIZATION
NOT CLASSIFIED (NOT AVAILABLE)
CARCINOGENICITY
NOT AVAILABLE
IARC : NOT AVAILABLE
NTP : NOT AVAILABLE
OSHA : NOT AVAILABLE
WISHA : NOT AVAILABLE
ACGIH : NOT AVAILABLE
MUTAGENICITY
NOT CLASSIFIED (NOT AVAILABLE)
REPRODUCTIVE TOXICITY
NOT CLASSIFIED (NOT AVAILABLE)
SPECIFIC TARGET ORGAN TOXICITY(SINGLE EXPOSURE)
NOT CLASSIFIED (NOT AVAILABLE)
SPECIFIC TARGET ORGAN TOXICITY(REPEAT EXPOSURE)
NOT CLASSIFIED (NOT AVAILABLE)
ASPIRATION HAZARD
NOT CLASSIFIED (NOT AVAILABLE)

SECTION 12 : ECOLOGICAL INFORMATION

ECOLOGICAL TOXICITY
FISH
NOT CLASSIFIED (NOT AVAILABLE)
CRUSTACEA
NOT CLASSIFIED (NOT AVAILABLE)
ALGAE
NOT CLASSIFIED (NOT AVAILABLE)
PERSISTENCE AND DEGRADABILITY
PERSISTENCE
NOT AVAILABLE
DEGRADABILITY
NOT AVAILABLE
BIOACCUMULATIVE POTENTIAL
BIOACCUMULATION
NOT AVAILABLE
BIODEGRADATION
NOT AVAILABLE
MOBILITY IN SOIL
NOT AVAILABLE

OTHER HAZARD EFFECTS
NOT AVAILABLE

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL METHOD
WASTE MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL CONTROL REGULATIONS.

DISPOSAL PRECAUTION
CONSIDER THE REQUIRE ATTENTIONS IN ACCORDANCE WITH WASTE TREATMENT MANAGEMENT REGULATION.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER
NOT APPLICABLE

UN PROPER SHIPPING NAME
NOT APPLICABLE

TRANSPORT HAZARD CLASS
NOT APPLICABLE

PACING GROUP
NOT APPLICABLE

MARINE POLLUTANT
NOT APPLICABLE

IMFORMATION NOTE
IN CASE OF FIRE
NOT APPLICABLE

IN CASE OF LEAKAGE
NOT APPLICABLE

SECTION 15: REGULATORY INFORMATION

EU CLASSIFICATION
CLASSIFICATION
NOT AVAILABLE

RISK PHRASES
NOT AVAILABLE

SAFETY PHRASES
NOT AVAILABLE

EU RoHS REGULATION (DIRECTIVE 2002/96/EC)
THE FOUR HEAVY METALS AND BROMINATED FLAME RETARDANTS WERE NOT DETECTED.
U.S.A MANAGEMENT INFORMATION

OSHA(29CFR1910.119)
NOT REGULATED

CERCLA 103(40CFR302.4)
NOT REGULATED

EPCRA 302(40CFR355.3)
NOT REGULATED

EPCRA 304(40CFR355.4)
NOT REGULATED

EPCRA 313(40CFR372.65)
NOT REGULATED

SARA CLASSIFICATION
SARA HAZARD CATEGORIES, SARA SECTIONS 311/312(40CFR370.21) : NONE
SARA SECTION 313(40CFR372.65) : NONE

SUBSTANCE OF ROTERDAME PROTOCOL
NOT REGULATED

SUBSTANCE OF STOCKHOLME PROTOCOL
NOT REGULATED

SUBSTANCE OF MONTREAL PROTOCOL
NOT REGULATED

INVENTORY STATUS

TSCA(US TOXIC SUBSTANCES CONTROL ACT) : ALL COMPONENTS OF THIS
PRODUCT ARE LISTED ON THE TSCA INVENTORY.

DSL(CANADIAN DOMESTIC SUBSTANCES LIST) : ALL COMPONENTS OF THIS
PRODUCT ARE LISTED ON THE DSL INVENTORY.

EINECS(EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL
SUBSTANCES) : THIS PRODUCT IS LISTED ON EINECS OR OTHERWISE
COMPLIES WITH EINECS REQUIREMENTS.

AICS/NICNAS(AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES AND
NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT
SCHEME) : ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE AICS
OR OTHERWISE COMPLY WITH NICNAS INVENTORY.

MITI(JAPANESE HANDBOOK OF EXISTING AND NEW CHEMICAL
SUBSTANCES) : ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE
MITI INVENTORY.

KECI(KOREAN EXISTING CHEMICAL AND CHEMICAL SUBSTANCES) : ALL
COMPONENTS OF THIS PRODUCT ARE LISTED ON THE KECI INVENTORY.

PICCS(PHILIPPINES INVENTORY OF CHEMICAL AND CHEMICAL SUBSTANCES)
ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE PICCS INVENTORY.

SECTION 16 : OTHER INFORMATION

INFORMATION SOURCE AND REFERENCES
KOREA OCCUPATIONAL HEALTH&SAFETY AGENCY(MSDS)
(HTTP://WWW.KOSHA.NET)
The product analysis conducted by Research Institute of Kolon
Industries, Inc.(Chemical)
ISSUING DATE
07 AUGUST 1996

REVISION NUMBER AND DATE

REVISION NUMBER
11TH

DATE OF THE LASTEST REVISION
1 JANUARY 2015

REASON FOR REVISION
CLASSIFICATION AND LABELLING OF CHEMICALS FOLLOWING GHS AND FOLLOWING THE NOTICE ABOUT PREPARING OF A MATERIAL SAFETY DATA SHEET.

PREPARED BY
G.D. KIM, MANAGER OF TECHNICAL TEAM,
ULSAN PLANT, KOLON INDUSTRIES

THE INFORMATION CONTAINED HEREIN IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF ACCURATE. SINCE MSDS IS TO PROVIDE INFORMATION ON THE HEALTH/SAFETY/ENVIRONMENT TO USERS OF THE SUBSTANCE, DATA WRITTEN HERE DO NOT MEAN TO ENSURE PROPERTIES OF MATTER OR SPEC.