

Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Material Name : **Hexane (extraction grade)**
Product Code : Q1252, Q1255

Other Names / Synonyms : Hexane extraction grade
Hexane food grade

Recommended use / Restrictions of use : For industrial use only.

Recommended use / Restrictions of use : Seed and oil extraction

Supplier : SHELL EASTERN CHEMICALS SINGAPORE
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2. HAZARDS IDENTIFICATION

GHS Classification : FLAMMABLE LIQUIDS, Category 2
SKIN CORROSION/IRRITATION, Category 2
SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (SINGLE EXPOSURE), Category 3
Narcotic effects.
SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY (REPEATED EXPOSURE), Category 2
Central nervous system (CNS).
Peripheral nervous system.
ASPIRATION HAZARD, Category 1
AQUATIC TOXICITY (ACUTE), Category 2

GHS label elements**Symbol(s)** :**Signal words** : Danger**GHS Hazard** : PHYSICAL HAZARDS:

Safety Data Sheet**statements**

Highly flammable liquid and vapour.
HEALTH HAZARDS:
Causes skin irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
May cause damage to organs or organ systems through prolonged or repeated exposure
Central nervous system (CNS).
Peripheral nervous system.
ENVIRONMENTAL HAZARDS:
Toxic to aquatic life.

GHS Precautionary statements

: PREVENTION:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

RESPONSE:

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash before re-use.
In case of fire: Use foam, water spray or fog for extinction.

STORAGE:

Store in accordance with local/regional/national/international regulations.
Store in a well-ventilated place. Keep cool.
Store locked up.

DISPOSAL:

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Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other Hazards which do not result in classification : In use, may form flammable/explosive vapour-air mixture.
Electrostatic charges may be generated during pumping.
Electrostatic discharge may cause fire.
Repeated exposure may cause skin dryness or cracking.
Slightly irritating to respiratory system.
Vapours may be irritating to the eye.

Aggravated Medical Condition : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin. Eyes. Central nervous system (CNS). Peripheral nervous system. Respiratory system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Hexane extraction grade
Hexane food grade
CAS No. : 64742-49-0
INDEX No. : 649-328-00-1
EINECS No. : 265-151-9

Hazardous Ingredients (GHS)

Chemical Identity	CAS	Identification number	Conc.[%]
n-Hexane	110-54-3	203-777-6	>= 10 - <= 30 %W

4. FIRST AID MEASURES

Inhalation : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

Skin Contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye Contact : Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (37° C), shortness of breath, chest congestion or continued coughing or wheezing.

Notes to physician

Most important symptoms/effects, acute & delayed : Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance.
Skin irritation signs and symptoms may include a burning

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sensation, redness, swelling, and/or blisters. Peripheral nerve damage may be evidenced by impairment of motor function (incoordination, unsteady walk, or muscle weakness in the extremities, and/or loss of sensation in the arms and legs). If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.

Immediate medical attention, special treatment : Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal. Call a doctor or poison control center for guidance. Potential for cardiac sensitisation, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy. Causes central nervous system depression. Dermatitis may result from prolonged or repeated exposure.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Specific Hazards : Carbon monoxide may be evolved if incomplete combustion occurs. Will float and can be reignited on surface water. The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Extinguishing Media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Do not discharge extinguishing waters into the aquatic environment.

Unsuitable Extinguishing Media : Do not use water in a jet.

Protective Equipment for Firefighters : Wear full protective clothing and self-contained breathing apparatus.

Other Advice : Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

Personal Precautions, Protective Equipment and Emergency Procedures : Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet.

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- Environmental Precautions** : Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Methods and material for containment and clean up** : For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
- Additional Advice** : See Chapter 13 for information on disposal. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapour may form an explosive mixture with air.

7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. On guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
- Precautions for safe handling** : Avoid contact with skin, eyes, and clothing. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/sec until fill pipe submerged to twice its diameter, then ≤ 7 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Handle and open container with care in a well-ventilated area. Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Do not empty into drains.
- Conditions for safe storage** : Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Bulk storage tanks should be diked (bunded). Keep away from aerosols, flammables, oxidizing agents, corrosives and from

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- other flammable products which are not harmful or toxic to man or to the environment. Storage Temperature: Ambient.
- Product Transfer** : Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/sec until fill pipe submerged to twice its diameter, then ≤ 7 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve.
- Recommended Materials** : For containers, or container linings use mild steel, stainless steel. For container paints, use epoxy paint, zinc silicate paint.
- Unsuitable Materials** : Avoid prolonged contact with natural, butyl or nitrile rubbers.
- Container Advice** : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.
- Other Advice** : Approved Handler: Test certificate required Ensure that all local regulations regarding handling and storage facilities are followed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Occupational Exposure Limits

In the absence of occupational exposure standards for this product, it is recommended that the following are adopted.

Material	Source	Type	ppm	mg/m3	Notation
RCP Technical Hexane	HSPA OELs	TWA (8 h)		300 mg/m3	
n-Hexane	ACGIH	TWA	50 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.
	ID OEL	NAB	50 ppm	176 mg/m3	

- Additional Information** : This ACGIH-value is provided for information only. SHELL IS is the Shell Internal Standard. Wash hands before eating, drinking, smoking and using the toilet. Skin notation means that significant exposure can also occur by absorption of liquid through the skin and of vapour through the eyes or mucous membranes.

Biological Limit Value (BLV) - See reference for full details

No biological limit allocated.

- Appropriate Engineering Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof

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	ventilation to control airborne concentrations below the exposure guidelines/limits. Eye washes and showers for emergency use.
Individual protection measures	: Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Respiratory Protection	: If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours [boiling point <65°C (149°F)] meeting EN371. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Hand Protection	: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739, AS/NZS:2161) made from the following materials may provide suitable chemical protection: Longer term protection: Nitrile rubber gloves Incidental contact/Splash protection: PVC or neoprene rubber gloves Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Eye Protection	: Monogoggles (EN166) Chemical splash goggles (chemical monogoggles).
Protective Clothing	: Chemical resistant gloves/gauntlets, boots, and apron. Skin protection not ordinarily required beyond standard issue work clothes.
Thermal hazards	: Not applicable.
Monitoring Methods	: Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Examples of sources of recommended air monitoring methods are given below or contact supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods, http://www.cdc.gov/niosh/nmam/nmammenu.html . Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods, http://www.osha-slc.gov/dts/slc/methods/toc.html . Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, http://www.hsl.gov.uk/search.htm . Berufsgenossenschaftliches Institut für Arbeitssicherheit (BIA), Germany http://www.hvbg.de/d/bia/index.html . L'Institut National de Recherche et de Sécurité, (INRS), France http://www.inrs.fr/securete/hygiene_securite_travail.html .

9. PHYSICAL AND CHEMICAL PROPERTIES

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Appearance	: Colourless Liquid.
Odour	: Paraffinic Sweet
Odour threshold	: Data not available.
pH	: Not applicable.
Initial Boiling point and boiling range	: Typical 63 - 79 °C / 145 - 174 °F
Melting / freezing point	: -95 °C / -139 °F
Pour point	: Typical -95 °C / -139 °F
Flash point	: -27 °C / -17 °F (IP 170)
Explosion / Flammability limits in air	: 1.1 - 7.4 % (V)
Auto-ignition temperature	: 375 °C / 707 °F (ASTM E-659)
Flammability (solid, gas)	: Data not available.
Vapour pressure	: Typical 8,000 Pa at 0 °C / 32 °F Typical 19,000 Pa at 20 °C / 68 °F Typical 58,500 Pa at 50 °C / 122 °F
Relative Density	: Data not available.
Density	: Typical 670 - 675 kg/m ³ at 15 °C / 59 °F (ASTM D-4052)
Water solubility	: 9.5 mg/l
Solubility in other solvents	: Hydrocarbon solvent(s) Miscible.
n-octanol/water partition coefficient (log Pow)	: 4
Decomposition temperature	: Note: Stable under normal conditions of use.
Dynamic viscosity	: Data not available.
Kinematic viscosity	: Typical 0.45 mm ² /s at 25 °C / 77 °F
Vapour density (air=1)	: 2.8
Electrical conductivity	: Typical 0.04 pS/m at 20 °C / 68 °F (ASTM D-4308)
Coefficient of expansion	: Typical 0.0009 / °C
Dielectric constant	: Typical 1.9 at 20 °C / 68 °F
Heat of vapourisation	: Typical 335 J/g
Refractive index	: Typical 1.379 at 20 °C / 68 °F (ASTM D-1218)
Reaction with water	: Not applicable.
Specific heat	: Typical 2.2 kJ/kg °C
Saturated Vapour concentration (in air)	: 670 g/m ³ at 20 °C / 68 °F (estimated value(s))
Thermal conductivity	: Typical 0.12 W/m °C
Volatile organic carbon content	: 84 % (EC/1999/13)
Evaporation rate (nBuAc=1)	: 1.4 (DIN 53170, di-ethyl ether=1) 8 (ASTM D 3539, nBuAc=1)
Surface tension	: Typical 18.5 mN/m at 20 °C / 68 °F (ASTM D-971)
Molecular weight	: 86 g/mol

10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions of use.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources.
Incompatible materials	: Strong oxidising agents.
Hazardous Decomposition Products	: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds

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	will be evolved when this material undergoes combustion or thermal or oxidative degradation.
Possibility of hazardous reactions	: Data not available.
Sensitivity to Static Discharge	: Data not available.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	: Information given is based on product testing, and/or similar products, and/or components.
Likely routes of exposure	: Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.
Acute Oral Toxicity	: Low toxicity: LD50 >5000 mg/kg , Rat
Acute Dermal Toxicity	: Low toxicity: LD50 >5000 mg/kg , Rabbit
Acute Inhalation Toxicity	: Expected to be of low toxicity if inhaled. High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin corrosion/irritation	: Irritating to skin. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.
Serious eye damage/irritation	: Essentially non-irritating to eyes. Vapours may be irritating to the eye. Insufficient to classify.
Respiratory Irritation	: Inhalation of vapours or mists may cause irritation to the respiratory system. Insufficient to classify.
Respiratory or skin sensitization	: Not expected to be a sensitiser.
Aspiration hazard	: Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Repeated Dose Toxicity	: Central nervous system: repeated exposure affects the nervous system. Peripheral nervous system: causes peripheral neuropathy which can be potentiated by ketones. (n-Hexane) Kidney: caused kidney effects in male rats which are not considered relevant to humans
Germ cell mutagenicity	: Not expected to be mutagenic.
Carcinogenicity	: Tumours produced in animals are not considered relevant to humans. (Solvent Naphtha (Petroleum), Light Aliphatic)
Reproductive and Developmental Toxicity	: Causes foetotoxicity in animals at doses which are maternally toxic. Affects reproductive system in animals at doses which produce other toxic effects. (n-Hexane)

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Additional Information : Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

12. ECOLOGICAL INFORMATION

Basis for Assessment : Incomplete ecotoxicological data are available for this product. The information given below is based partly on a knowledge of the components and the ecotoxicology of similar products.

Acute Toxicity

Fish : Expected to be toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Aquatic Invertebrates : Expected to be toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Algae : Expected to be toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Microorganisms : Expected to be toxic: $1 < LC/EC/IC50 \leq 10$ mg/l

Mobility : Floats on water.

If product enters soil, it will be highly mobile and may contaminate groundwater.

Persistence/degradability : Readily biodegradable.
Oxidises rapidly by photo-chemical reactions in air.

Bioaccumulative potential : Has the potential to bioaccumulate.

Other Adverse Effects : Data not available.

13. DISPOSAL CONSIDERATIONS

Material Disposal : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.

Container Disposal : Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums. Send to drum recoverer or metal reclaimer.

Local Legislation : Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

14. TRANSPORT INFORMATION**Land (as per ADR classification): Regulated**

Class : 3

Packing group : II

Hazard identification no. : 33

UN No. : 1208

Danger label (primary risk) : 3

Proper shipping name : HEXANES

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Identification number	UN 1208
Proper shipping name	HEXANES
Class / Division	3
Packing group	II
Marine pollutant:	Yes

IATA (Country variations may apply)

UN No.	: 1208
Proper shipping name	: Hexanes
Class / Division	: 3
Packing group	: II

Additional Information : This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

DSL	: Listed.	
INV (CN)	: Listed.	
TSCA	: Listed.	
EINECS	: Listed.	265-151-9
KECI (KR)	: Listed.	KE-25623
PICCS (PH)	: Listed.	
Other Information	: 94/69/EC (21st ATP). The benzene content of this product is less than 0.1%. Nota P applies. Classification and labelling as carcinogen (R45) is not required.	

Rules on hazard communication of dangerous and harmful materials.

Rules on public hazardous products and flammable pressurized gases installation and safety management.

Rules on toxic chemicals.

Standard on harm prevention of specific chemical substance.

Rules on organic solvent poison prevention.

Rules on pressurized gas labour safety.

GOVERNMENT REGULATION OF THE REPUBLIC OF INDONESIA NO. 74 YEAR 2001, CONCERNING THE MANAGEMENT OF HAZARDOUS AND TOXIC MATERIALS, THE PRESIDENT OF THE REPUBLIC OF INDONESIA. REPUBLIC OF INDONESIA MINISTER OF INDUSTRY REGULATION, Number 87/M-IND/PER-9/2009, CONCERNING GLOBAL HARMONIZATION SYSTEM CLASSIFICATION AND LABELS ON CHEMICALS. MINISTER OF MANPOWER DECREE OF THE REPUBLIC OF

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INDONESIA NO. 187 YEAR 1999 CONCERNING MANAGING
OF HAZARDOUS CHEMICAL.

16. OTHER INFORMATION

- MSDS Version Number** : 5.
- MSDS Effective Date** : 24.03.2010
- MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- Uses and Restrictions** : For industrial use only.
Use only in industrial processes.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product
- Disclaimer** : This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.