SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product name: Busch R 550

Supplier’s details
Supplier: Busch LLC
516 Viking Drive
Virginia Beach, VA 23452

Telephone: (757) 463-7800

Emergency telephone number: For transport emergency call Chemtrec (800) 424-9300 or Busch LLC (757) 463-7800 for non-emergencies.

Recommended use of the chemical and restrictions on use
Recommended use: Gear lubricant.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Not a hazardous substance or mixture.

GHS Label element
Hazard pictograms: No Hazard Symbol required
Signal word: No signal word

Hazard statements
PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements
Prevention: No precautionary phrases.
Response: No precautionary phrases.
Storage: No precautionary phrases.
Disposal: No precautionary phrases.

Other hazards which do not result in classification
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Used oil may contain harmful impurities.
Not classified as flammable but will burn.

The classification of this material is based on OSHA HCS 2012 criteria.

Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Blend of polyolefins and additives.

Hazardous components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Synonyms</th>
<th>CAS-No.</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialkyl thiophosphate ester</td>
<td></td>
<td>268567-32-4</td>
<td>0.1 - 0.99</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.
If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

Most important symptoms and effects, both acute and delayed : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.

Immediate medical attention, special treatment : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Vacuum Pumps and Systems

Busch LLC, 516 Viking Drive, Virginia Beach, VA 23452

Version 1.0
Revision Date: 08/11/2015

Unsuitable extinguishing media

: Do not use water in a jet.

Specific hazards during firefighting

: Hazardous combustion products may include:
  A complex mixture of airborne solid and liquid particulates and gases (smoke).
  Carbon monoxide may be evolved if incomplete combustion occurs.
  Unidentified organic and inorganic compounds.

Specific extinguishing methods

: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for firefighters

: Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Avoid contact with skin and eyes.

Environmental precautions

: Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up

: Slippery when spilt. Avoid accidents, clean up immediately.
  Prevent from spreading by making a barrier with sand, earth or other containment material.
  Reclaim liquid directly or in an absorbent.
  Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional advice

: For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
  For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

Technical measures

: Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
  Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate measures.
Precautions for safe handling: Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Avoidance of contact: Strong oxidising agents.

Product Transfer: This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Storage
Other data: Keep container tightly closed and in a cool, well-ventilated place. Use properly labeled and closable containers. Store at ambient temperature.

Packaging material: Suitable material: For containers or container linings, use mild steel or high density polyethylene. Unsuitable material: PVC.

Container Advice: Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

### SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

#### Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil mist, mineral</td>
<td>Not Assigned</td>
<td>TWA ((inhalable fraction))</td>
<td>5 mg/m³</td>
<td>US. ACGIH Threshold Limit Values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Mist)</td>
<td>5 mg/m³</td>
<td>OSHA_TRA</td>
</tr>
</tbody>
</table>

**Biological occupational exposure limits**

No biological limit allocated.

**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. Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods
Engineering measures: 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 ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:
- Define procedures for safe handling and maintenance of controls.
- Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
- Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
- Drain down system prior to equipment break-in or maintenance.
- Retain drain downs in sealed storage pending disposal or subsequent recycle.
- Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
- Practice good housekeeping.

Personal protective equipment

Respiratory protection: No respiratory protection is ordinarily required under normal conditions of use.

In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. 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 the combination of organic gases and vapours [Type A / Type P boiling point >65°C (149°F)].

Hand protection: Where hand contact with the product may occur the use of
gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide
suitable chemical protection. PVC, neoprene or nitrile rubber
gloves Suitability and durability of a glove is dependent on
usage, e.g. frequency and duration of contact, chemical re-
sistance of glove material, dexterity. Always seek advice from
glove suppliers. Contaminated gloves should be replaced.
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. Appli-
cation of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with break-
through time of more than 240 minutes with preference for >
480 minutes where suitable gloves can be identified. For
short-term/splash protection we recommend the same, but
recognize that suitable gloves offering this level of protection
may not be available and in this case a lower breakthrough
time maybe acceptable so long as appropriate maintenance
and replacement regimes are followed. Glove thickness is not
a good predictor of glove resistance to a chemical as it is
dependent on the exact composition of the glove material.
Glove thickness should be typically greater than 0.35 mm
depending on the glove make and model.

Eye protection : If material is handled such that it could be splashed into eyes,
protective eyewear is recommended.

Skin and body protection : Skin protection is not ordinarily required beyond standard
work clothes. It is good practice to wear chemical resistant gloves.

Protective measures : Personal protective equipment (PPE) should meet recom-
manded national standards. Check with PPE suppliers.

Environmental exposure controls

General advice : Take appropriate measures to fulfill the requirements of rele-
vant environmental protection legislation. Avoid contamination
of the environment by following advice given in Chapter 6. If
necessary, prevent undissolved material from being dis-
charged to waste water. Waste water should be treated in a
municipal or industrial waste water treatment plant before
discharge to surface water. Local guidelines on emission limits for volatile substances
must be observed for the discharge of exhaust air containing
vapour.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid at room temperature.

Colour : yellow

Odour : Slight hydrocarbon

Odour Threshold : Data not available
pH : Not applicable

pour point : -48 °C / -54 °F Method: ISO 3016

Initial boiling point and boiling range : > 280 °C / 536 °F Estimated value(s)

Flash point : 240 °C / 464 °F Method: ISO 2592

Evaporation rate : Data not available

Flammability (solid, gas) : Data not available

Upper explosion limit : Typical 10 %(V)

Lower explosion limit : Typical 1 %(V)

Vapour pressure : < 0.5 Pa (20 °C / 68 °F) Estimated value(s)

Relative vapour density : > 1 Estimated value(s)

Relative density : 0.848 (15 °C / 59 °F)

Density : 848.4 kg/m3 (15.0 °C / 59.0 °F) Method: ISO 12185

Solubility(ies)

Water solubility : negligible

Solubility in other solvents : Data not available

Partition coefficient: n-octanol/water : Pow: > 6(based on information on similar products)

Auto-ignition temperature : > 320 °C / 608 °F

Viscosity

Viscosity, dynamic : Data not available

Viscosity, kinematic : 220 mm2/s (40.0 °C / 104.0 °F) Method: ISO 3104

25.9 mm2/s (100 °C / 212 °F) Method: ISO 3104

Conductivity : This material is not expected to be a static accumulator.
SECTION 10. STABILITY AND REACTIVITY

Reactivity: The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

Chemical stability: Stable.

Possibility of hazardous reactions: Reacts with strong oxidising agents.

Conditions to avoid: Extremes of temperature and direct sunlight.

Incompatible materials: Strong oxidising agents.

Hazardous decomposition products: Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment: Information given is based on data on the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:
Acute oral toxicity: LD50 (rat): > 5,000 mg/kg
   Remarks: Expected to be of low toxicity:

Acute inhalation toxicity: Remarks: Not considered to be an inhalation hazard under normal conditions of use.

Acute dermal toxicity: LD50 (Rabbit): > 5,000 mg/kg
   Remarks: Expected to be of low toxicity:

Skin corrosion/irritation

Product:
Remarks: Expected to be slightly irritating.

Serious eye damage/eye irritation

Product:
Remarks: Expected to be slightly irritating.
Respiratory or skin sensitisation

**Product:**
Remarks: Not expected to be a skin sensitiser.

**Components:**
**Dialkyl thiophosphate ester:**
Remarks: May cause an allergic skin reaction in sensitive individuals.

Germ cell mutagenicity

**Product:**
Remarks: Not considered a mutagenic hazard.

Carcinogenicity

**Product:**
Remarks: Not expected to be carcinogenic.

- **IARC**
  No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

- **ACGIH**
  No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

- **OSHA**
  No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

- **NTP**
  No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

**Product:**
Remarks: Not expected to impair fertility., Not expected to be a developmental toxicant.

STOT - single exposure

**Product:**
Remarks: Not expected to be a hazard.
STOT - repeated exposure

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:
Not considered an aspiration hazard.

Further information

Remarks: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal., ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: Slightly irritating to respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment: Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s). (LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product: Toxicity to fish (Acute toxicity):
Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l

Product: Toxicity to daphnia and other aquatic invertebrates (Acute toxicity):
Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l

Product: Toxicity to algae (Acute toxicity):
Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l

Product: Toxicity to fish (Chronic toxicity):
Remarks: Data not available

Product: Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
Remarks: Data not available

Product: Toxicity to bacteria (Acute toxicity):
Remarks: Data not available
toxicity)

**Persistence and degradability**

**Product:**

**Biodegradability**

Remarks: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.

**Bioaccumulative potential**

**Product:**

**Bioaccumulation**

Remarks: Contains components with the potential to bioaccumulate.

**Mobility in soil**

**Product:**

**Mobility**

Remarks: Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile.

Remarks: Floats on water.

**Other adverse effects**

no data available

**Product:**

**Additional ecological information**

Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture. May cause physical fouling of aquatic organisms.

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**SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal methods**

**Waste from residues**

Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Waste, spills or used product is dangerous waste.

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.

**Contaminated packaging**

Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)
Not regulated as a dangerous good

International Regulation

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

<table>
<thead>
<tr>
<th>Pollution category</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship type</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Product name</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Special precautions</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Special precautions for user

Remarks : Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Additional Information : MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : No OSHA Hazards

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ., this material is classified as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Water Act
This product does not contain any Hazardous Chemicals listed under the U.S. Clean Water Act, Section 311, Table 117.3.

California Prop 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:
EINECS : All components listed or polymer exempt.
TSCA : All components listed.
DSL : All components listed.

SECTION 16. OTHER INFORMATION

Further information
NFPA Rating (Health, Fire, Reactivity)  0, 1, 0

Due to the conversion of this product to GHS classification and labelling, there has been a significant change to the nature of the information presented in chapter 2.

A vertical bar (|) in the left margin indicates an amendment from the previous version.

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
Revision Date : 08/05/2015

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.