Convey Dangerous Goods by Road - Part I
Signage and documentation

Warning signs

It is important to remember when transporting dangerous goods and hazardous materials that care is taken to display the correct warning signs and safety decals are displayed for the load being carried, especially when the consignment/load is a MIXED LOAD with products of different danger/hazard classes.

Placards, warning diamond

As per SANS 10232 (1) Dangerous Goods Placards shall be constructed as follows:

- It shall be of size 700 mm x 400 mm
- It shall be divided into four zones by black lines (10 mm) and have a black border of 10 mm
- It shall be constructed of material that will prevent distortion during road transportation

- The background colour shall be as prescribed in the SANS code of practice

Placards for vehicles less than 3500 kg's shall also comply with all the prescribed requirements, but may be of a reduced size i.e. 350 mm x 200 mm.

PREScribed PLACARDING FOR VEHICLES CARRYING DANGEROUS GOODS:

A – GOODS IDENTIFICATION ZONE (UN NO:)

B – OPERATOR TELEPHONIC ADVICE ZONE

C – SPECIALIST ADVICE TELEPHONIC ZONE

D – HAZARD CLASS DIAMOND ZONE
Single Substance Placard:

- UN NO : 1748
- CLASS : OXIDIZER
- SUBSIDIARY RISK : NONE
- SUBSTANCE : CALCIUM HYPOCHLORITE

Single substance placard with subsidiary risk:

- UN NO : 1017
- CLASS : CORROSIVE
- SUBSIDIARY RISK : TOXIC GAS
- UN NO : 1017
- CLASS : TOXIC GAS
- SUBSIDIARY RISK : CORROSIVE
- SUBSTANCE : CHLORINE

*Mixed Load Placard:*

<table>
<thead>
<tr>
<th>MULTI LOAD</th>
<th>DANGEROUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(012) 542 1358</td>
<td></td>
</tr>
<tr>
<td>(016) 428 7070</td>
<td></td>
</tr>
</tbody>
</table>

- UN NO : MIXED LOAD
- CLASS : UNIDENTIFIED
- SUBSIDIARY RISK : UNIDENTIFIED
- SUBSTANCE : UNIDENTIFIED
**SPLIT PLACARDING CONFIGURATION:**

Freight containers shall have split placarding that consists of a goods identification rectangle, a hazard class diamond or MIXED LOAD diamond and a subsidiary risk diamond as prescribed:

- The goods identification rectangle shall be of a height not less than 120 mm and of a width not less than 300 mm, the rectangle shall have a black border of width 10 mm and the background colour shall be orange with black characters.

- The goods identification rectangle shall contain either the UN NO:, or the word “MIXED LOAD” or the word “WASTE" followed by the UN NO: as applicable.

- The goods identification rectangle shall be placed adjacent (on either side of) the hazard class diamond and subsidiary risk diamond.
Warning signs and safety devices displayed on a vehicle carrying dangerous goods or hazardous materials:

The vehicle must display an orange warning diamond on the front of 300 mm x 300 mm in size.

The vehicle must display 3 x “No Smoking” decals adjacent to the hazard warning placards.

The vehicle must display 3 x “No Open Flame” decals adjacent to the hazard warning placards.

The vehicle must display 3 x “No Cell Phones” decals adjacent to the hazard warning placards when carry flammable products.
Elevated Temperature warning signs are used for Bulk Tankers carrying liquids or solids where the temperature in the case of Liquids exceeds 100 degrees Celsius and in the case of solids 240 degrees Celsius.

**Safety devices and equipment:**

Vehicles conveying dangerous goods require to be fitted or carry the following minimum safety devices and equipment:

- Fitted with an isolator switch
- Insulated or PVC battery cover or enclosed in a box
- Warning triangles
- 2 x 9kg DCP fire extinguishers
- 1 x CO2 fire extinguishers fitted inside the cab for electrical fires
- A designated space (orange document bag or holder) for dangerous Goods documents during road transportation
- A basic first aid kit

The vehicle must display 3 x “Elevated Temperature” decals adjacent to the hazard warning placards when applicable.
- Prescribed PPC/PPE (protective clothing & equipment) for dangerous goods incidents
- A spill kit and/or leak containment equipment

**Dangerous goods hazard classes**

<table>
<thead>
<tr>
<th>Warning diamond</th>
<th>Subclass</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosives</td>
<td>1.1</td>
<td>Mass explosion hazards</td>
<td>Dynamite, TNT, detonating fuses</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>Projection hazards</td>
<td>Bombs and hand grenades</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
<td>Fire hazards</td>
<td>Distress signals, Sodium pycramate</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>No significant hazards</td>
<td>Fireworks, Shotgun cartidges</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>Very insensitive</td>
<td>Blasting gel</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>Extremely insensitive</td>
<td>Restricted munitions</td>
</tr>
<tr>
<td>Gases</td>
<td>2.1</td>
<td>Flammable gases</td>
<td>Acetylene, Butane, Calor gas, Aerosols, Hydrogen, LPG, Methane, Propane</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>Non-flammable, non-toxic gases (dangerous because they are compressed or harmful for other reasons eg deprive the air of oxygen)</td>
<td>Argon, Carbon dioxide, Helium, Oxygen</td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>Toxic gases (so poisonous or corrosive that they are known to be extremely dangerous to life)</td>
<td>Ammonia, Chlorine, Carbon monoxide, Hydrogen chloride, Phosgene, Sulphur dioxide</td>
</tr>
<tr>
<td>Warning</td>
<td>Subclass</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>diamond</td>
<td>3</td>
<td>Flammable liquids (ignite easily with a flash point of 60.5 degrees or less)</td>
<td>Acetone, Benzene, Diesel, Ethanol (alcohol), Petrol, Tar, Toluene.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 80% of dangerous goods transported belong to Class 3.</td>
<td>Methylated spirits, Paraffin, Turpentine</td>
</tr>
<tr>
<td></td>
<td>4.1</td>
<td>Flammable solids (easily lit by spark or flame or which burn readily or which can catch fire through friction)</td>
<td>Camphor, Matches, Naphthalene, Red phosphorous, Scrap rubber, Sulphur, Wax polish</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>Spontaneously combustible (liquids or solids which generate their own heat and which will self-ignite when exposed to air)</td>
<td>Activated carbon, Cotton waste, Fishmeal, Maneb, Metal shavings, Oil/seed cake, Sodium sulphide, White phosphorous</td>
</tr>
<tr>
<td></td>
<td>4.3</td>
<td>Dangerous when wet substances (on contact with water may catch fire by themselves or emit flammable or toxic gases)</td>
<td>Aluminium phosphide, Calcium carbide, Lithium, Magnesium powder, Sodium, Zinc dust</td>
</tr>
<tr>
<td></td>
<td>5.1</td>
<td>Oxidizers (not necessarily flammable in themselves, they can produce large amounts of oxygen increasing the risk and intensity of fire in other materials)</td>
<td>Ammonium nitrate, Calcium hypochlorite (HTH), Hydrogen peroxide bleach, Lead nitrate</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>Organic peroxides (sensitive to heat are thermally unstable and generate large amounts of heat as they breakdown)</td>
<td>Benzoyl peroxide used in acne creams and hair dye, Di-tert-butyl peroxide used to initiate polymerization of ethylene, styrene and vinyl chloride</td>
</tr>
<tr>
<td></td>
<td>6.1</td>
<td>Toxic substances (cause illness or death if swallowed, inhaled or if absorbed by the skin) Nearly all emit poisonous gases in a fire</td>
<td>Arsenic, cadmium oxide, Cadmium chloride, Creosote, Cyanides, Phenol, Some pesticides</td>
</tr>
<tr>
<td></td>
<td>6.2</td>
<td>Infectious substances (contain bacteria, viruses, parasites and fungi which cause disease in humans and animals)</td>
<td>Medical waste, Pathological specimens, Ebola virus</td>
</tr>
<tr>
<td>Warning diamond</td>
<td>Subclass</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>-----------------</td>
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</tr>
<tr>
<td>Radioactive Material</td>
<td>7</td>
<td>Radioactive materials (comprising highly penetrative gamma rays, beta particles which can penetrate skin and alpha particles not hazardous unless swallowed or absorbed through a wound)</td>
<td>Type A medical medication, Nuclear fuel, Cobalt, Radium, Uranium, Plutonium</td>
</tr>
<tr>
<td>Corrosives</td>
<td>8</td>
<td>Corrosives (acids and caustic substances in liquid or solid form which chemically eat away a substance and severely damage living tissue) Leakage can also damage other cargo and react with metals used in the construction of vehicles</td>
<td>Acid filled batteries, Hydrochloric acid (spirits of salts and pool acid), Sulphuric acid, Quicklime, Iodine, Lye, Potash, Sodium hydroxide (caustic soda drain cleaner), Soldering flux</td>
</tr>
<tr>
<td>Miscellaneous Dangerous Goods</td>
<td>9</td>
<td>Miscellaneous (goods which present a danger but cannot be classified in any of the other classes) They include environmentally hazardous substances.</td>
<td>Air bag inflators or modules, Asbestos, Lithium batteries, Expandable polystyrene beads</td>
</tr>
</tbody>
</table>

**Statutory documents**

- Regulation 281 of the National Road Traffic Act
- Tremcard/Treccard
- Dangerous Goods Declaration
- Professional driving permit – PrDP (D)
- Operators Card/Disc
Dangerous Goods Declaration

Operational requirements

**Dangerous goods declaration**

- The DGD shall comply with the requirements of SANS 10232-1.
- The DGD shall be stored in the designated space.
- Copies of the DGD shall be retained by the consignor for a minimum of 90 days after the date of shipment, if no incident is reported. If an incident is reported, the DGD shall be retained for the duration of the relevant investigation.
Example of a Dangerous Goods Declaration

**DANGEROUS GOODS DECLARATION**

<table>
<thead>
<tr>
<th>Consignment Note No:</th>
<th>101 11X</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consignor:</strong></td>
<td>PE CHEMICALS</td>
</tr>
<tr>
<td></td>
<td>63 Burman Road</td>
</tr>
<tr>
<td></td>
<td>Deal Party</td>
</tr>
<tr>
<td></td>
<td>Port Elizabeth</td>
</tr>
<tr>
<td><strong>Operator:</strong></td>
<td>SPEED TRUCK</td>
</tr>
<tr>
<td></td>
<td>1 Watt Road</td>
</tr>
<tr>
<td></td>
<td>Deal Party</td>
</tr>
<tr>
<td></td>
<td>Port Elizabeth</td>
</tr>
<tr>
<td><strong>Reg. No. Vehicle:</strong></td>
<td>DHP 587 EC</td>
</tr>
<tr>
<td><strong>Product manufacturer:</strong></td>
<td>Protea Chemicals</td>
</tr>
<tr>
<td></td>
<td>175 Grahamstown Road</td>
</tr>
<tr>
<td></td>
<td>Deal Party</td>
</tr>
<tr>
<td></td>
<td>Port Elizabeth</td>
</tr>
<tr>
<td><strong>Product owner:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Product custodian:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Party contracting the operator:</strong></td>
<td>PE CHEMICALS</td>
</tr>
<tr>
<td></td>
<td>63 Burman Road</td>
</tr>
<tr>
<td></td>
<td>Deal Party</td>
</tr>
<tr>
<td></td>
<td>Port Elizabeth</td>
</tr>
<tr>
<td><strong>Additional information on handling / transport / storage:</strong></td>
<td>The package marked with UN XXXX shall be shaded from sunlight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipping name</th>
<th>UN No.</th>
<th>Haz Class</th>
<th>PG</th>
<th>Quantity &amp; type of packaging</th>
<th>Gross mass kg</th>
<th>Net Mass/vol kg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinner</td>
<td>1263</td>
<td>3</td>
<td>III</td>
<td>2 fibreboard boxes, 4 x 5 L each</td>
<td>52</td>
<td>41.5</td>
</tr>
</tbody>
</table>

**DECLARATIONS**

"I hereby declare that the content of this consignment is fully and accurately described above by the proper shipping name, and is classified, packaged, marked and labelled/placarded and in all respects, in proper condition for transport in accordance with the relevant national legislation."

Where the consignor is not the manufacturer, the declaration is based on information received.

**Consignor:** Product manufacturer / Product owner / Product custodian / Contracting Party that contracts the operator:

Signed: R A Jones  Date: 15/09/2009

"The consignment described above has been received into my vehicle. My vehicle is correctly placarded and I am in possession of all necessary transport documentation pertaining to the transport of dangerous goods, including information to be followed in the case of an emergency."

**Driver**

Signed: J. K de Beer  Date: 15/09/2009
Transport emergency cards

A transport emergency card contains the hazards and emergency information for a material being transported in a clear and concise manner. It ensures that the driver of the vehicle transporting dangerous goods knows exactly what load he or she is transporting, as well as the risk presented by the goods being carried. The card also serves as a concise and quick reference in an emergency situation and therefore includes instructions on how to respond in an emergency, such as a spillage or fire. This information is also essential for the emergency services in the event of an accident.

The transport emergency card can either be generated from the European Council of Chemical Manufacturers’ Federation (CEFIC) system, called a TREMCARD, or in accordance with SANS 10232-4, called TREC.

“TREMCARDS” or Transport emergency cards must be placed in the “DESIGNATED SPACE” or orange document bag/holder in the cab of any vehicle carrying dangerous goods where quantities exceed the exempt quantities. The purpose is to instruct the driver what to do in the event of an incident and may also assist emergency response workers, as they carry information which is specific to the particular goods being carried. There must be a “TREMCARD” for each dangerous goods item in the load. The consignor must either supply the card/s or give enough information for the operator to obtain the correct card/s. However, this does not absolve the carrier from a legal obligation to ensure that cards are in fact appropriate
to the load. It is vital that the driver read and understand the card for any product/s before loading it.
| **TRANSPORT EMERGENCY CARD** – Road transport In accordance with SANS 10232-4 |
| PROPER SHIPPING NAME |
| APPEARANCE |
| DANGER |
| PERSONAL PROTECTIVE EQUIPMENT |
| EMERGENCY RESPONSE EQUIPMENT |
| DRIVER FIRST ACTIONS – Only if it can be carried out without personal risk |
| DRIVER SPECIAL/ADDITIONAL ACTIONS – Only if it can be carried out without personal risk |
| DRIVER ACTIONS IN CASE OF FIRE – Only if it can be carried out without personal risk |
| FIRST AID |
| SPECIAL INFORMATION FOR EMERGENCY SERVICES |
| ADDITIONAL INFORMATION EMERGENCY TELEPHONE NUMBERS |
| PREPARED BY ………………………… from the best knowledge currently available; no guarantee is provided that the information is sufficient or correct under all circumstances. |

Date M/Y: …………………………
Reference: …………………………
Example of a TREM CARD

TRANSPORT EMERGENCY CARD (Road Transport)
In accordance with SANS 10232-4

PROPER SHIPPING NAME:
FLAMMABLE LIQUID, CORROSIVE, N.O.S.

Name of Substance(s): Acetic Acid, Glacial

Appearance and Characteristics:
- Coloured liquid
- Strong perceptible odour
- Soluble with water

NATURE OF DANGER:
- HIGHLY FLAMMABLE / COMBUSTIBLE MATERIAL. Easily ignited by friction, heat, sparks or flames.
- Some substances could burn rapidly with flare-burning effect.
- Vapour could form explosive mixture with air. Some substances could polymerize (P) explosively when heated or involved in a fire.
- Containers could explode when heated. Many liquids are lighter than water.
- Substance could re-ignite after fire is extinguished.
- Runoff to sewers could create fire or explosion hazard.
- Fire produces a combination of irritating, corrosive and toxic gases
- Immediately remove contaminated clothing, including shoes. If exposed wash body with plenty of water.
- Runoff from fire control could cause pollution

PERSONAL PROTECTIVE EQUIPMENT
- Goggles, face shield or other suitable eye and face protection
- Light protective clothing
- Protective gloves
- Protective footwear
- Eyewash bottle with clean water
- Suitable respiratory protection
- Two self standing warning signs, handlamp, warning vest

EMERGENCY RESPONSE EQUIPMENT
- Shovel
- Broom
- Sand or other absorbent materials

GENERAL ACTIONS BY THE DRIVER
- Stop the engine
- No naked lights. No smoking.
- Mark roads with self standing warning signs and warn other road users or passers - by
- Keep public away from danger area. Keep upwind.
- Notify police and fire brigade as soon as possible.

ADDITIONAL AND/OR SPECIAL ACTIONS BY THE DRIVER
- Any action only if without personal risk
- Avoid direct contact with the substance
- Stop leaks if without risk
- Prevent liquids coming in contact with sewer, sewage, basements and workplaces.
- Contain or absorb leaking liquid with sand or earth or other suitable material, using shovel or broom.
- Warn everybody - FLAMMABLE LIQUID (Corrosive)

FIRST AID
- Remove contaminated clothing immediately and wash affected skin with soap and water
- If substance has got into the eyes, immediately wash out with plenty of water.
- Continue treatment until medical assistance is provided.
- Apply artificial respiration only if patient is not breathing or under medical supervision.
- Seek medical treatment when anyone has symptoms apparently due to inhalation, swallowing or contact with skin or eyes.
- Persons who have breathed the gas or fumes produced in a fire or who have come into contact with the substance may not show immediate symptoms. They should be taken to a doctor with this card. Patient must be kept under medical supervision for at least 24 hours.

SPECIAL INFORMATION FOR THE EMERGENCY SERVICES
- Keep container(s) cool by spraying with water if exposed to fire.
- Extinguish with water. Do not use dry chemical or foam. If possible prevent water runoff running into sewers.
- Remove absorbent substance to safe place.
- Use dry plastic or stainless steel containers for repacking.

Additional Information:
- Emergency Telephone: 041-4861264 / 082 571 3817
- Trade Name: Acetic Acid, Glacial

Supplier: PE Chemicals
Prepared By: Transport Logistics Consultants - Mike Fitzmaurice
Issue Date: 05/01/2009 Expiry Date: 05/01/2012 Reference: PE CHEM / 001 / 2789

Prepared from the best information currently available; no guarantee is provided that the information is sufficient or correct under all circumstances.
Professional Driving Permit – PrDP (D):

- The driver must be in possession of a valid PrDP – D before conveying dangerous goods over the exempt quantity.
- His license must be free of endorsements.
- He must have a valid HAZCHEM certificate (not older than 6 months).
- He must have had medical examination within the last 6 months and have a certificate to prove it.

Operators Card/Disc:

![Operators Card/Disc Image]
Vehicles conveying dangerous goods are required to display an operator card/disc indicating that the vehicle is approved, by an approved testing station, to carry and convey dangerous goods *(Must indicate category “D” on the operator card)*.

**Other legislative/prescribed documentation:**

- A Transport permit for the transportation of flammable liquids and gasses, where applicable - not a by law in all provinces.

- A permit to transport explosives, ammunition or fireworks (if applicable).

- A cross border road transportation permit (if applicable).

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**Document Compiled By:**

Mike Fitzmaurice of Transport Logistics Consultants

**For:**

Freight Into Africa