RISKTECH

Technical Bulletin No.12

Fire Safety

Recharging Battery Powered Industrial Trucks

The objective of this bulletin is to ensure awareness in relation to fire safety risks associated with recharging battery powered industrial trucks and to provide guidance as to how to minimise these risks.

The two types of batteries commonly used are lead-acid and nickel-iron that contain corrosive chemical solutions, either acid or alkali and, therefore, present a chemical hazard. While being charged, the batteries liberate hydrogen and oxygen which, in certain concentrations, can be explosive.

There have been a number of reported fire losses involving these units, principally during the recharging process. Insulation, battery boxes and accumulated grease deposits on battery powered trucks are combustible material which may become ignited and involve the truck in fire.

The principal source of ignition is short circuiting wiring. An electrical disturbance may cause a fire in grease and dirt on the truck, insulation or charging equipment. Fires involving the charging equipment invariably occur outside of normal operating hours when these trucks are on charge, preparatory to the following days' shift. The key consideration for fire safety, in relation to battery powered industrial trucks, is the location and installation of the recharging units.

The following are important considerations for both the location and installation of battery recharger units.

- Battery charging installations should be located in areas designated for that purpose. Such areas shall be kept free of extraneous combustible materials.
- The designated recharging areas should be demarcated by cross hatched floor markings to delineate storage free zones.
- The location for the battery charging area should be selected to ensure adequate natural ventilation or, if this is not possible, provide high level mechanical extraction and ventilation to atmosphere.
- Battery recharge units should be located against a non-combustible wall. These units should not be placed against composite panel (e.g. EPS) or walls of other combustible construction.

- If it is not possible to mount the recharger adjacent to a non-combustible wall, then a fire barrier consisting of 7mm flexible fibrous cement sheeting or 0.6mm steel sheet should be erected between the recharger and a combustible wall extending at least 1.5m above the top of the battery recharge unit and 1.5m either side of the battery recharge units and be provided with an air gap between the fire barrier and the wall to reduce and/or impede radiant and convective heat transfer into the combustible wall material.

- Battery recharge units should be mounted on an appropriate, corrosive proof, non-combustible stand.
- A clear space of 1.5m should be maintained in all directions from the recharge zone to neighbouring combustible materials such as storage and the like.
- Electrical installations shall be in accordance with AS/NZS 3000: Electrical Code and any local Acts, Regulations and Codes of Practice.
- Automatic fire detection and/or automatic fire suppression should preferably be provided within the recharge area.
- An appropriate multi-class portable fire extinguisher should be available within the immediate area of the battery recharge area.
- Trained and authorised personnel only should be permitted to change or charge batteries.
- Trucks should be positioned properly and brakes should be applied before attempting to change or charge batteries.
- When charging batteries, vent caps should be kept in place to avoid electrolyte spray. Care should be taken to ensure that vent caps are functioning. The battery (or compartment) cover(s) should be open to dissipate heat and gas.
- Smoking should not be permitted in the charging area.
- Precautions should be taken to prevent open flames, sparks or electric arcs in any battery charging areas (hot work permit applicable).
- Tools and other metal metallic objects shall be kept away from the tops of uncovered batteries.
- Where handling acid or alkaline concentrates, an eyewash fountain should be available within the immediate area.
- Facilities should also be provided for:
  - Flushing spilled electrolyte;
  - Protecting charging apparatus from damage by trucks.

References:

FM Loss Prevention Data Sheet 7-39

NFPA505 Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance and Operation.