

# Storage of Palm Kernel Extract (PK or PKE)

## Top tips for securing tools, gear and equipment

Palm Kernel stored in bulk piles is susceptible to spontaneous heating, and eventually combustion, if not handled properly. There have been several fires in New Zealand in recent years due to this.

Spontaneous heating is caused by a chemical reaction called oxidation which leads to Palm Kernel heating up, if this heat is not dispersed the Palm Kernel will eventually catch fire.



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## What creates spontaneous heating?

How much Palm Kernel heats up is influenced by:

- The moisture content, of the Palm Kernel
- The amount of oil left in the Palm Kernel after it's been processed.
- The presence of flammable solvents in the Palm Kernel if oil has been extracted using solvents

Heating occurs because a high moisture content promotes microbiological activity, This speeds up the oxidation process of residual oil which can reach temperatures high enough to cause ignition.

## Storing Palm Kernel

You can minimise the risk of spontaneous heating and combustion with good management. Formal procedures should be developed, documented and implemented to ensure that the risks associated with operation are managed appropriately e.g. housekeeping standards, hot work controls, smoking controls, self-inspection routines etc.

## Temperature management

Have a documented procedure for monitoring and recording temperature as well as the actions to be taken if temperatures exceed pre-determined parameters. Clearly assign responsibility for temperature recording and reporting to a specific person.

- Temperature readings should be recorded before stowing any new shipment of the Palm Kernel and every two days afterwards.
- All temperature readings should be recorded so that a rising temperature trend can be easily identified.
- Readings should be taken at a minimum depth of 500mm below the surface and from multiple locations.
- Ensure anyone who takes temperature readings is trained and avoids taking readings from the top of the pile due to the risk of being engulfed.

### Action should be taken where:

- The records indicate that there is a sustained rising temperature trend over several days
- There is a 10°C or more rise in temperature between one temperature reading and the next i.e. within 48 hours, or
- The temperature of the pile exceeds 50°C.

### Where self-heating is suspected:

- Expose the centre of the pile.
- Check and rearrange the Palm Kernel product, restow the central portion last.
- Be extra vigilant when rearranging the pile because as the Palm Kernel is moved air is introduced to the pile which may accelerate combustion.
- Have suitable firefighting equipment such as a high-volume fire hose on hand to deal with any flare-up.

If the pile catches fire, or there is any likelihood of flare-ups, the Fire Brigade must be called.

Irrespective of whether a temperature rise is detected, the pile must be completely turned over every four months if daily operations don't achieve this. Spontaneous heating and ignition are more common in products that are stored long-term.

## Housekeeping & Maintenance

- Buildings should be water-tight and annual inspections carried out on the gutters and spouting to check for blockages/leaks etc., as moisture promotes self-heating within Palm Kernel.
- Palm Kernel should not come into contact with heat and ignition sources such as electric equipment, lights, smoking materials, hot engines etc. Regular cleaning routines must be in place to ensure Palm Kernel doesn't build up on plant, equipment, electrical components or any surfaces which get hot.
- Keep plant and equipment a minimum of 10 metres away from the Palm Kernel piles when not in use.
- The electrical system and its components must be suitable for the environment e.g. designed to prevent the ingress of moisture or combustible particles. Also ensure that failure of any electrical does not come in contact with the Palm kernel. Palm Kernel must be kept separate from hazardous substances such as explosives, flammable gasses, liquid or solids, oxidizing agents and oxygen cylinders.
- Staff must be fully trained regarding the risks of the product, safe handling practices and appropriate emergency response.
- Provide enough fire extinguishers of the correct size and type in accordance with NZS 4503 to protect the area.

Vero Insurance must be advised of any change in the product composition, or if new product is to be stored in the same location.

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