



## Safe handling of metal alkyls First aid recommendations

### Introduction

AkzoNobel supplies a wide range of metal alkyls and their solutions in portable tanks to the olefin polymerization and other industries. The products in these tanks are transferred to a storage or blending tank via an unloading station.

Incidents can occur in this unloading station during making and breaking connections. A fully trained operator, who is wearing protective clothing, should therefore do the handling involved. Although the protective clothing covers the complete body and gives good protection against small spills, parts of the body may accidentally come in contact with metal alkyl.

If exposure occurs, even metal alkyl solutions can cause severe burns. Concentrated metal alkyls will react immediately with moisture on the skin or in the eye to produce severe thermal and chemical burns. Dilute solutions cause less severe burns, but should be treated similarly. If exposure occurs, immediately initiate the procedure recommended in this bulletin. Simultaneously contact a physician and describe the type and extent of exposure and symptoms.

## First aid measures

The first aid measures include recommendations on how to handle when eyes, skin or respiratory tracts have been exposed to metal alkyls. In addition, the proper actions to be taken when the clothing of the operator catches fire, are described.

Eyes and skin that are exposed to metal alkyl should always be treated with large quantities of running water. This seems contradictory because of the reaction of metal alkyls with water, but when large quantities are used the water will act as a diluent and will instantly react with the metal alkyl; water cools the skin as well.

**Note:** *When water is not used and metal alkyl reacts slowly with moisture, deeper and more severe burns will occur!*



## Eye contact

To prevent metal alkyl contact with eyes, safety glasses and a face shield are strongly recommended. The face shield with chin piece should easily fit to a hard hat.

If eye contact does occur:

- Immediately flush the eyes with large quantities of running water for a minimum of 15 minutes. Hold the eyelids apart during irrigation to insure flushing to the entire surface of the eye and lids with water
- Do not attempt to neutralize with chemical agents
- Oil or ointments should be used only on the advice of a physician
- Obtain medical attention immediately
- Continue the irrigation for an additional 15 minutes if a physician is not immediately available

## **Skin contact**

AkzoNobel recommends wearing of aluminized suits in combination with undergarment and gloves to protect the skin against accidental contact with metal alkyl.

If skin contact does occur:

- Place the person as soon as possible under a safety shower
- Immediately remove contaminated clothing to prevent further exposure
- Do not remove clothing, which adheres to skin
- If victim requests help in clothing removal, those who assist should take precautions to prevent contact with metal alkyl
- Flush all affected areas with large amounts of water for a minimum of 15 minutes
- Do not attempt to neutralize with chemical agents
- If ice is available, apply locally to affected area
- Obtain medical advice immediately

## **Clothing fire**

Although the recommended protective equipment is fire-retardant, the clothing may catch fire.

If clothing fire occurs:

- Place the person immediately under a safety shower, extinguish with dry chemical or use fire blanket
- Do not remove clothing, which adheres to burned skin
- Flush all affected areas with large amounts of water for a minimum of 15 minutes
- Do not attempt to neutralize with chemical agents
- If ice is available, apply locally to affected area
- Obtain medical advice immediately

## **Inhalation**

The inhalation of metal alkyls as such is very unlikely, due to their spontaneous oxidation/ combustion when exposed to air, and their vigorous reaction with water.

However, the fumes generated by these reactions can be inhaled.

The oxidation/combustion of aluminum alkyls forms aluminum oxide. AkzoNobel has determined that approximately 90% of the aluminum oxide formed leaves the burning area via the smoke plume.

Although aluminum oxide itself is relatively harmless, inhalation of the hot smoke should be avoided because of non-specific lung effects of ultra-fine dust.

Fires of halogen-containing metal alkyls will release halogen-containing components. For example hydrogen chloride will be produced upon combustion of DEAC, EADC and EASC.

Gases including CO<sub>2</sub>, CO, H<sub>2</sub>, alkanes and alkenes, can be formed during the combustion and during the reaction of metal alkyls with air. Toxic gases like CO<sub>x</sub> and NO<sub>x</sub>, originating from the burned hydrocarbon solvents, also add to the potential hazards of burning metal alkyls.

The symptoms of exposure to aluminum oxide and above mentioned gases, as may generally be produced in cases of large fires, might vary from slight headache and irritation of the eyes, nose and throat, to a delayed pulmonary oedema in serious cases.

If a person is exposed to heavy smoke:

- remove person from contaminated atmosphere after first ensuring your own safety
- if breathing has ceased, clear the air ways and start mouth to mouth or artificial respiration, which may be supplemented by the use of a bag-mask respirator or a manually-triggered oxygen supply capable of delivering one liter per second or more
- if the person is breathing, oxygen may be administered from a demand-type continuous-flow inhalator, preferably with advice of a physician
- obtain medical advice immediately.

## Conclusion

AkzoNobel recommends the first aid measures described in this technical bulletin for both neat metal alkyls and their solutions.

To prevent exposure to metal alkyls, we recommend that protective equipment be worn during handling operations. Suggested suppliers are given in our technical bulletin 'Operator protection during handling metal alkyls'. When accidental exposure to metal alkyls takes place, treatment with water is essential. We recommend that safety showers, eye-showers and/or eye-wash bottles be made available in the vicinity of the handling area (e.g. unloading station, sample points etc.)

For further information on this subject, please contact your AkzoNobel representative.

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