



DEALING WITH WASTE MATERIALS

HOW CAN WE DEFINE WASTE?

Waste is:

- Any substance which constitutes a scrap material or effluent or other unwanted surplus substance arising from the application of any process.
- Any substance or article which requires disposal when broken, worn out, contaminated or otherwise spoiled.

Waste products can be divided into two categories:

- Uncontrolled waste
- Controlled waste

CONTROLLED WASTE

Controlled waste can be further sub-divided into:

- Household waste
- Industrial waste
- Commercial waste

Having defined waste, it is worth considering why any company should attempt to minimise the waste it generates. There are two main reasons for minimising waste:

- To increase its own operational efficiency
- To avoid the cost and penalties associated with waste disposal

WASTE DISPOSAL METHODS

There are a number of ways in which a waste material can be safely disposed. They include:

- Re-cycling
- Solid waste disposal
- Liquid waste disposal

All the above should be undertaken by reputable waste management organisations who are equipped with the proper facilities to deal with the waste correctly.



HAZARDOUS MATERIALS

Hazardous materials can often be identified by certain characteristics. They may be:

- Corrosive
- Flammable
- Reactive
- Toxic

Some materials are consumed during use. Some may no longer be required when they have reached the end of their lifespan, such as chemicals, oils etc. and must be disposed of safely by licensed waste management specialists.



DUTY OF CARE

The duty of care is applicable to every person who has control of controlled waste at any stage from production to disposal.

What is meant by the term “duty of care”?

It requires people to take all reasonable steps to prevent the illegal disposal or management of controlled wastes by themselves or any other person.

SPILLAGE

If a substance is accidentally spilt, before attempting to deal with the situation, ensure that:

- All appropriate PPE is being worn to guard against contamination.
- If the substance is potentially hazardous, contact a manager who should be equipped with the information to deal with the incident and inform the appropriate authority. A Magistrates Court can impose fines of up to £500,000 for pollution offences, and if the case goes to the Crown Court there is no limit to the fine.

There are a number of ways in which a spillage can be contained. Some of the equipment includes:

- Oil and chemical absorbents
- Spill response kits
- Re-useable oil absorbents
- Drain mats

High quality absorbents include:

- Pads
- Rolls
- Pillows
- Sump pillows
- Booms
- Granules

PREVENTION OF SPILLAGE TO WATER COURSE

- To prevent a spillage entering a water course some of the aforementioned actions could be taken.
- Under the Water Resources Act 1991, it is a criminal offence to cause or knowingly permit any pollution matter to be discharged into “controlled waters” except in accordance with the terms of a discharge consent.

Controlled water includes:

- Inland lakes, rivers and canals, estuaries, and coastal waters, etc



PRACTICAL ACTIONS

There are a number of ways that contribute to protecting the environment they include:

- Using environmentally friendly construction techniques.
- Using material from a renewable resource.

Minimising waste and recycling is not only good for the environment but it can also be cost affective by using less materials and not having to pay for the removal of waste materials.

Recycling - there are a number of ways to look at recycling:

- Can the material be returned to the manufacturers to enable them to reprocess it?
- Can it be reused at an alternative site?

ENGINEERING'S IMPACT

- Global warming
- The ozone layer
- Smog
- Acid rain
- Airborne particles



Global warming - energy from the sun drives the earth's weather and climate, and heats the earth's surface. Then in turn, the earth radiates energy back into space. Atmospheric greenhouse gases trap some of the outgoing energy, retaining some of the heat.

Greenhouse gases – water vapour, carbon dioxide, methane, nitrous oxide, ozone. Without the natural greenhouse effect, temperatures would be much lower than they are now. However, problems may arise when the atmospheric concentration of greenhouse gases increases.

ENGINEERING'S IMPACT CONT...

According to scientists, the earth's surface temperature has risen by more than 1.0C in the past century, with accelerated warming over the past two decades. Since 1970, global surface temperatures have risen faster than in any other 50-year period over the past 2,000 years.

Since the beginning of the industrial revolution, atmospheric concentrations of greenhouse gases increased:

- *CARBON DIOXIDE UP BY ~30%*
- *NITROUS OXIDE UP BY ~15%*
- *OXMETHANE UP BY ~50%*

It is believed that the combustion of fossil fuels and other industrial activities are the primary reasons for the increased concentration of carbon dioxide.

ACID RAIN

Acid rain is the term used to describe the deposition of acidic air pollution. Although some air pollutants fall directly back to earth, a lot of it returns in the form of:

- Rain
- Snow
- Sleet
- Hail
- Mist
- Fog

