



## WASTE DISPOSAL

### IO2 – EDUCATIONAL MATERIALS

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# Waste Disposal

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**Waste** can take any form that is either:

- Solid;
- Liquid;
- Gas;

and each have different methods of disposal and management.

# Waste Management or Waste Disposals

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- Activities and actions required to manage waste from its inception to its final disposal.
- This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling.
- Waste management normally deals with all types of waste whether it was created in forms that are industrial, biological, household, and special cases where it may pose a threat to human health.

# Waste Management or Waste Disposals

## Waste management or waste disposals → The “Waste Hierarchy”

Refers to the "3 Rs": **R**educe; **R**euse and **R**ecycle,  
which classify waste management strategies according to their  
desirability  
in terms of waste minimisation.

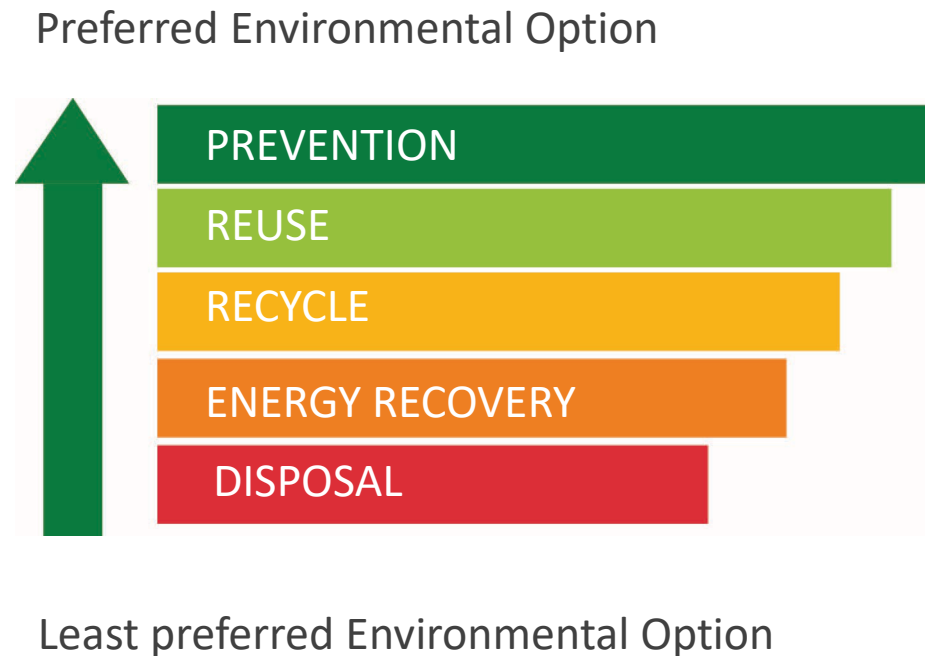


The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.

Figure 1 – 3c's. Source:  
<http://zone.recycledevon.org/fun-stuff>

# Waste Management or Waste Disposals

Waste management or waste disposals → The “Waste Hierarchy”



# Methods of Waste Disposal

- Preventing or reducing waste generation;
- Recycling;
- Incineration;
- Composting;
- Sanitary Landfill;



Figure 2 – waste management. Source: <https://careers.wm.com/us/en>



Figure 3 – Compost. Source: <https://civileats.com/2016/06/01/can-compost-recycle-our-drugs/>

# Waste Disposal

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Waste is not something that should be discarded or disposed of with no regard for future use.

It can be a valuable resource if addressed correctly, through policy and practice.

With rational and consistent waste management practices there is an opportunity to reap a range of benefits, specifically in the **Environmental field**, as it's possible to reduce or eliminate adverse impacts on the environment through:

- Reducing;
- Reusing and recycling;
- Minimizing resource extraction can provide **improved air and water quality and help in the reduction of greenhouse gas emissions.**



# Welding Shops

**Welding shops** generate waste materials, mostly scrap metal which can be easily recycled.

This recycling operation is good for the **environment** and consists also in a source of revenue.

Safe disposal of waste it's one of the most important health and safety issues associated with welding and related activities.



Figure 4 – Welding. Source:  
<https://www.indiamart.com/sigmagroup/training-certifications.html>



# Consumables Welding Industry

The **consumables welding industry** manufactures a large quantity of products that are utilized as welding or coating material on metallic materials, generating big quantities of waste rich in toxic metals that causes negative environmental impacts when disposed incorrectly.

At present, these wastes are disposed in industrial landfills or they are co-processed in cement ovens.

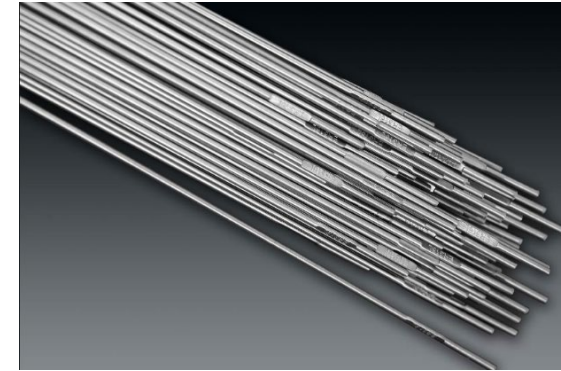


Figure 6 – Welding rod stainless steel.

Source: <https://dir.indiamart.com/ahmedabad/stainless-steel-welding-electrodes.html>



Figure 5 – hard face welding rod.

Source: <https://www.indiamart.com/shiva-engineers-rajkot/hard-facing-welding-electrodes.html>

# Waste Disposal Process Steps

- Distinguish material as waste;
- Wear PPE;
- Containerize waste;
- Label waste with date;
- Store waste;
- Submit waste disposal form.



Figure 7– Transfer Station.

Source: <https://www.kewauneetransferstation.com/commercial-services.html>

# Waste Disposal

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The activities in waste management involve risk either to the worker directly involved or to the informal enterprise operators.

The original aim of regulating waste disposal is to reduce the introduction of polluting substances into the atmosphere

# Hazardous Wastes

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- Wastes or combinations of waste that pose a substantial present or potential hazard to humans or other living organisms;
- Any waste which is poisonous, corrosive, noxious, explosive, inflammable, radioactive, toxic, or harmful to the environment;
- Significant quantities of solid waste are generated in industrial sectors involved in manufacturing and construction;
- Metals dominate in the manufacturing and construction enterprises. **This can be attributed to the nature of activities associated with these enterprises that include welding;**

# Risks Categories

- Occupational accidents;
- Physical risks;
- Chemical risks;
- Ergonomic risks;
- Psychological risks;
- Biological risks;



Figure 8– Sign. Source: <https://www.roadtrafficsigns.com/rural-road-signs>

# Health Risks

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**The health risks** either to the worker directly involved or to the enterprise operators and nearby residents are caused by **many factors** that include the following:

- The nature of raw waste;
- Its composition (e.g., toxic, allergic, and infectious substances);
- Its components (e.g., gases, dusts, leachates, and sharps);
- The handling of waste (e.g., shovelling, lifting, equipment vibrations, and accidents);

# Mechanical Hazards

- Cuts from sharp items (saw blades, cutting and grinding disks, and metal pieces).
- Tetanus resulting from rusty wires and scrap metals.
- Traumatic injuries from metal scrap sharp objects from welding issues.



Figure 9 – Profile Iron.  
Source: <https://www.alamy.com/stock-photo/profile-industry-reflection-iron-horizontal.html>



Figure 10– Cutting Disk Metal.  
Source: <http://www.akounelis.gr/dronco-m-20.html>



# PPE

- Dust masks;
- Respirators;
- Work-suits;
- Gloves;
- Safety shoes;



Figure 11,12,13,14 – Personal Protective Equipment. Sources:<http://www.workwearoutlet.co.uk/herock-safety-footwear/>; <http://apex-garcinia.co/dust-mask-lowes/>; <https://www.screwfix.com/c/safety-workwear/disposable/cat7190001>; <https://dir.indiamart.com/vadodara/industrial-gloves.html>

# Injuries Prevention

Scrap metal from **welding shops** and garages is hazardous since people experience cuts when collecting and disposing waste materials.

Rusting metals have the potential of causing tetanus in people.



Figure 15 & 16– Safety Warnings. Sources:<https://www.seton.co.uk/safety-signs/recycling-signs>; <https://www.compliancesigns.com/signs/Scrap-Metal>;

# Welding Shop Containers



Figure 17 – Containers. Sources: <http://www.venturemetalsinc.com/blog/>





Figure 22– Hard Wood.  
 Sources:no source



Figure 23– Black metal cutting disks.  
 Sources:[https://www.ebay.ie/sch/sis.html?\\_itemId=262634270507&\\_nkw=ABRACS+SABRE+CUT+STAINLESS+STEEL+INOX+CHOPSAW+DISC+350+x+2+8+x25+14+x+6&\\_mPrRngCbx=1](https://www.ebay.ie/sch/sis.html?_itemId=262634270507&_nkw=ABRACS+SABRE+CUT+STAINLESS+STEEL+INOX+CHOPSAW+DISC+350+x+2+8+x25+14+x+6&_mPrRngCbx=1)



Figure 24– mig welding wire.  
 Sources:<https://www.amazon.com/Welding-Wire-L-56-035-Spool/dp/B005Q9HYBS>



# Material Safety Data Sheet (MSDS)

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Every welding consumable and some welding accessories (where applicable) should be provided with its own;

Always consult and read the MSDS that comes with the welding consumable, either in form of welding rod, wire/tubular wire, covered electrode or flux, or with some accessories used in welding operations;

Required by Law and OSHA (Occupational Safety and Health Administration);

# Material Safety Data Sheet (MSDS)

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- Provides basic information on a material or chemical product;
- Contains information on the properties and potential hazards of the material, how to use it safely, and what to do if there is an emergency;
- Are written for several audiences other than welding coordination personal, and welders using the material;
- Is an essential starting point for the development of a complete health and safety program for the material, including Disposal Considerations;
- Does not usually contain all the steps and precautions necessary for adequate hazardous waste disposal;



# Material Safety Data Sheet (MSDS)

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- The MSDS often does not give the federal, provincial, or local regulations which must be followed.
- The appropriate authorities for your area should be contacted for this information.

# SAFETY DATA SHEET

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** CONARC 60G

**Product Size:** 2,5 mm (3/32")

**Other means of identification**

**SDS number:** 200000006945

**Recommended use and restriction on use**

**Recommended use:** SMAW (Shielded Metal Arc Welding)

**Restrictions on use:** Not know. Read this SDS before using this product.

**Manufacturer/Importer/Supplier/Distributor Information**

Company name: Lincol Electric Europe B.V.

Adress: Nijmegen 6534AD, the Netherlands

Telephone: +31 243 522 911

Contact Person: Safety Data Sheet Questions: [www.lincolnelectric.com/sds](http://www.lincolnelectric.com/sds)

Arc Welding Safety Information: [www.lincolnelectric.com/safety](http://www.lincolnelectric.com/safety)

# Material Safety Data Sheet (MSDS)

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## **SECTION 13 – Disposal Considerations**

- This section of the MSDS is intended mainly for environmental professionals.
- Disposal considerations, including waste treatment methods and legislation, related to this consumable.

## 13. DISPOSAL CONSIDERATIONS

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### ***13.1 Waste treatment methods***

Non-contaminated waste from production and welding rods are recyclable. The unused product is not classified as hazardous waste. Dispose in accordance with appropriate government regulations.

Any residues of finely divided product ( particles, dust, fumes) may be are regarded as Hazardous Waste, depending on local regulations.

### ***13.2 EU and Local Legislation***

The recommendations given are considered appropriate for sale disposal. However, local regulations may be more stringent and these must be complied with. EURAL CODE: 120113

# Example – TID ROD for stainless steel

## Section 13: Disposal considerations

### 13.1 Waste treatment methods

**General Information:** The generation of waste should be avoided or minimized whenever possible- When practical, recycle in na environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

**Disposal instructions:** Disposal of this product may be regulated as a Hazardous Waste. The welding consumable and/or by-product from welding process (including, but no limited to slag, dust, etc.) may contain levels of leachable heavy metals such as Barium or Chromium. Prior to disposal, a representative sample must be analyzed in accordance with US EPA's Toxicity Characteristic Leaching Procedure (TCLP) to determine if any constituents exist above regulated threshold levels. Discard any product, residue, disposable container, or liner in na environmentally acceptable manner according to Federal, State and Local Regulations.

**Contaminated Packaging:** Dispose of contents/container to na appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

# Example – Solid MIG Wire for Aluminum

## Section 13: Disposal considerations

### 13.1 Waste treatment methods

**General Information:** The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements.

**Disposal instructions:** Disposal of this product may be regulated as a Hazardous Waste. The welding consumable and/or by-product from welding process (including, but not limited to slag, dust, etc.) may contain levels of leachable heavy metals such as Barium or Chromium. Prior to disposal, a representative sample must be analyzed in accordance with US EPA's Toxicity Characteristic Leaching Procedure (TCLP) to determine if any constituents exist above regulated threshold levels. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner according to Federal, State and Local Regulations.

**Contaminated Packaging:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

# Example – Agglomerated Flux

## Section 13: Disposal considerations

### 13.1 Waste treatment methods

**General Information:** The generation of waste should be avoided or minimized whenever possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local requirements. Minerals of such as Florida Zircon Sand are used as one of the components in the manufacturing of welding fluxes contain trace levels of Naturally Occurring Radioactive Material (NORM). Based on the radiological status of these materials, the scrap flux and waste slag generated in welding processes should be acceptable for disposal in RCRA Title D landfills. Flux materials containing sufficiently low concentrations of NORM are not subject to federal radiation control regulations. **The regulation for classifying the flux material (zircon sand) in Title 10, Code of Federal Regulations, Part 40 Section 40.13 (10CFR40.13). Materials which contain less than 0.05% by weight of uranium and/or Thorium, are exempt from regulation.** The concentrations in the flux and slag are considerably lower than 0.05% (0.05%). Note: Many states are developing regulations pertaining to Naturally Occurring Radioactive Materials (NORM) above background levels. Consult with the applicable regulations and the authority with jurisdiction.

**Disposal instructions:** Disposal of this material and its container to hazardous or special waste collection point.

**Contaminated Packaging:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.



# Waste Disposal

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Welding accessories → Release Agent → water-based welding protection spray on the basis of renewable raw materials.

Natural rapeseed components prevent weld spatter from adhering to surfaces such as metal, tools, appliances or welding nozzles.

The product is free from solvents, mineral oil and silicone,  
During welding, there will be no unpleasant odours or smoke nuisance for the user.

# Waste Disposal

## Section 13: Disposal considerations

**Disposal methods:** The generation of waste should be avoided or minimized whenever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

# Disposal Considerations

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- Comply the requirements of environmental protection;
- Comply the waste disposal legislation and any regional local authority requirements;
- Waste packaging should be recycle;
- Incenaration or landfill should be considered when recycling is not feasible;
- This material and its container must be disposed of in a safe way;

# Legislation

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Regarding Safe disposal of waste materials, there is **legislation** governing the proper disposal of waste, ranging from low risk waste through to hazardous waste.

These laws are enforced by the Environment Agency and Local Authorities.

When waste is disposed, certain types of waste may require waste tracking notes or may need to be disposed of by specialists. Particularly if it's hazardous.