

Metal industry

Introduction

The metal smelting and refining industry processes metal ores and scrap metal to obtain pure metals. The metal working industries process metals in order to manufacture machine components, machinery, instruments and tools which are needed by other industries as well as by the other different sectors of the economy. Various types of metals and alloys are used as starting materials, including rolled stock (bars, strips, light sections, sheets or tubes) and drawn stock (bars, light sections, tubes or wire). Metal industries are classified as industrial establishments as per decree 5243/2001. Various emissions can result from this industrial activity as described below. This factsheet intends on identifying the main resulting pollutants and specifically develops the ways for treatment of hazardous waste ones.

Process description

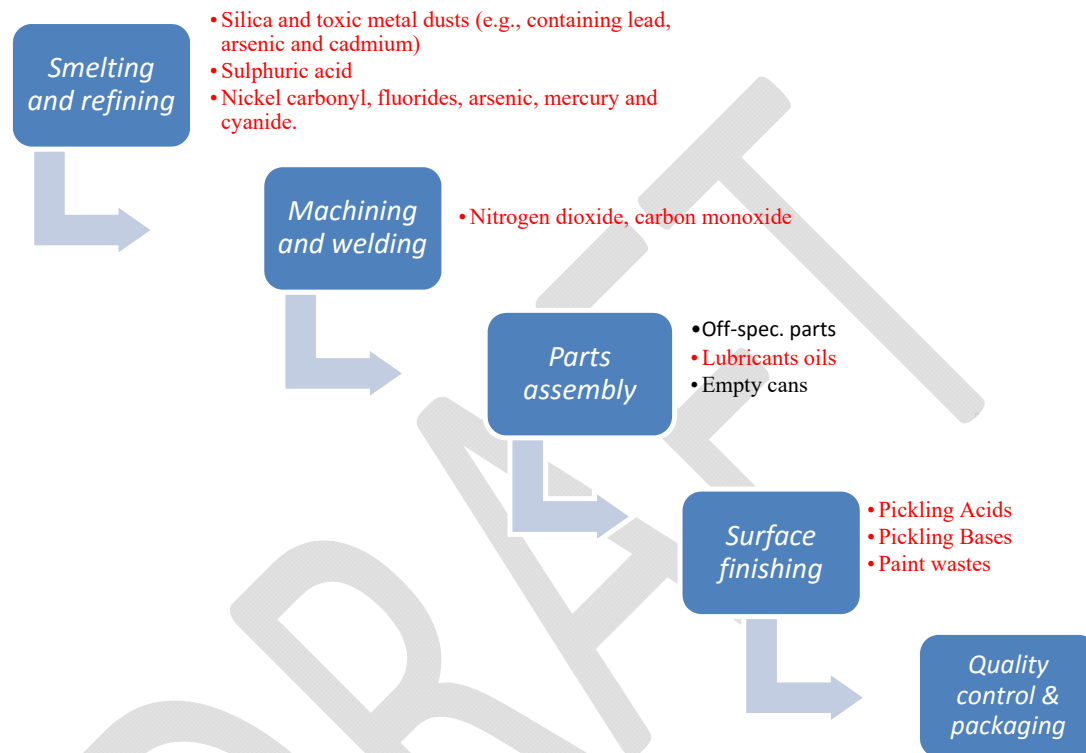
The following five production stages show the main steps of the metal process:

1. *Smelting and refining*: Two metal recovery technologies are generally used to produce refined metals, pyrometallurgical and hydrometallurgical. Pyrometallurgical processes use heat to separate desired metals from other materials. These processes use differences between oxidation potentials, melting points, vapour pressures, densities and/or miscibility of the ore components when melted. Hydrometallurgical technologies differ from pyrometallurgical processes in that the desired metals are separated from other materials using techniques that capitalize on differences between constituent solubilities and/or electrochemical properties while in aqueous solutions.
2. *Machining and welding*: Gas Metal Arc Welding (GMAW), by definition, is an arc welding process which produces the coalescence of metals by heating them with an arc between a continuously fed filler metal electrode and the work. The process uses shielding from an externally supplied gas to protect the molten weld pool.
3. *Parts assembly*: assembly include gluing, staking, forming, handle marking and decorating, such as hot stamping and roll transfer printing. Also perform secondary machining operations on metals and plastics.
4. *Surface finishing*: Metal finishing comprises a broad range of processes that are practiced by most industries which manufacture metal parts. Typically, manufacturers perform the finishing after a metal part has been formed. Finishing can be any operation that alters the surface of a workpiece to achieve a certain property. Common metal finishes include paint, galvanizing, lacquer, ceramic coatings, and other surface treatments. This manual mainly addresses the plating and surface treatment processes
5. *Quality control & packaging*: To specify the various physical and mechanical properties of the finished product, various tests, both destructive and nondestructive, are performed. Metallurgical, hardness, hardenability, tension,

The content of this draft Fact Sheet has been compiled to the best of our knowledge. The fact sheet will be continuously updated based on consultation with concerned industries or relevant stakeholders.

ductility, compression, fatigue, impact, wear, corrosion, creep, machinability, radiography, magnetic particle, ultrasonic, and eddy current are some of the major tests that are performed by quality control personnel.

The common activities and associated pollutants at metal facilities are outlined in the following chart. The hazardous wastes are highlighted in red.



References: UNIDO, MSCIPP, ERM studies. Typical example only.

Metal Industry Hazardous Waste Description and Management

Description of waste	Waste Code (EWC)	Waste Classification (Dangerous Goods Classification)	Basel Class.	Storage	Transport (UN-Code)	Treatment	HS-Code
Pickling acids	110105*	8	A1060	8B	3264	D9	3204
Pickling bases	110107*	8	A1060	8B	3262	D9	3204
Gases in pressure containers (including halons) containing dangerous substances	160504*	2.1	-	2A	1978	R1	7309
Separately collected electrolyte	160606*	8	A4090	8B	2796	D9	2811
Sulphuric acid and sulphurous acid	060101*	8	A4090	8B	1830	D9	2807
Inorganic chemicals consisting of or containing dangerous substances	160507*	various	A4140	various	various	D10	2846
Waste paint and varnish containing organic solvents or other dangerous substances	080111*	3	A4070	3	1263	D10	3208
Oily water from oil/water separators	130507*	9	A4060	12	3082	D9	27

The content of this draft Fact Sheet has been compiled to the best of our knowledge. The fact sheet will be continuously updated based on consultation with concerned industries or relevant stakeholders.

European Waste Code (EWC) 060101*: Sulphuric acid and sulphurous acid
European Waste Code (EWC) 080111*: Waste paint and varnish containing organic solvents or other dangerous substances
European Waste Code (EWC) 110105*: Pickling acids
European Waste Code (EWC) 110107*: Pickling bases
European Waste Code (EWC) 130507*: Oily water from oil/water separators
European Waste Code (EWC) 160504*: Gases in pressure containers (including halons) containing dangerous substances
European Waste Code (EWC) 160606*: Separately collected electrolyte
European Waste Code (EWC) 160507*: Discarded inorganic chemicals consisting of or containing dangerous substances

Waste Classification (Dangerous Goods Classification) 8: Corrosives



Waste Classification (Dangerous Goods Classification) 2.1: Flammable Gases



Waste Classification (Dangerous Goods Classification) 3: Flammable Liquids



Waste Classification (Dangerous Goods Classification) 9: Miscellaneous Dangerous Goods

Basel Classification A1060: Waste liquors from the pickling of metals

Basel Classification A4090: Waste acidic or basic solutions

Basel Classification A4140: Waste consisting of hazardous chemicals

Basel Classification A4070: Wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish

Basel Classification A4060: Waste oils/water, hydrocarbons/water mixtures, emulsions

Transport Code (UN) 1263: Paint-related materials including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base, or paint related material including paint thinning, drying, removing, or reducing compound

Transport Code (UN) 1830: Sulfuric acid with more than 51 percent acid

Transport Code (UN) 1978: Propane also Petroleum gases, liquified

Transport Code (UN) 2796: Battery fluid, acid or Sulfuric acid with not more than 51 percent acid

Transport Code (UN) 3082: Environmentally hazardous substance, liquid, n.o.s.

Transport Code (UN) 3262: Corrosive solid, basic, inorganic, n.o.s.

Transport Code (UN) 3264: Corrosive liquid, acidic, inorganic, n.o.s.

D9: Physico-chemical treatment facility (for example: evaporation, drying, calcination, neutralization, precipitation)

D10: Incineration on land.

R1: Use as a fuel.

Disposal Facilities**MEAB Schöneiche – Märkische Entsorgungsanlagen Betriebsgesellschaft mbH**

Address: Am Galluner Kanal, 15806 Schöneiche

Site: Tschudistraße 3, 14476 Potsdam

Point of Contact: Christine Landgraf; Tel. 033208-60 281; c.landgraf@meab.de

NORD (Dänemark) – Nordgroup A/ S – Ekokem A/ S

Lindholmvej 3, DK – 5800 Nyborg

Point of Contact: Jens Peter Rasmussen; Tel: +4563317100; jpr@nordgroup.eu

GSB Baar-Ebenhausen - gsb- Entsorgungsbetrieb Ebenhausen

Äußerer Ring 50, 85107 Baar-Ebenhausen

Point of Contact: Peter Pentenrieder, Tel.: +49 (0) 84 53 / 91-6 15, Mobil: +49 (0) 170 / 28 68 791, peter.pentenrieder@gsb-mbh.de

Fernwärme Wien - Wien Energie GmbH

Kundenservice Abfallwirtschaft, Simmeringer Haide, 11. Haidequerstrasse 6, 1110 Wien

Point of Contact: Tel: +43 (0)1 4004-89695, abfall@wienenergie.at

SABD Frank-Schweitzer-Str - Sala Abfallbehandlung und Dienstleistungen GmbH

Frank-Schweitzer-Straße 3, 12681 Berlin

Point of Contact: Stephan Hauptmann, +49 30-54 98 76 53, mail@sabd.de

EGEO Portugal

Rua Miguel Bombarda, n.º 71, Quinta dos Almostéis, 2689-508 Sacavém

Point of Contact: Tel: +351 219 499 200; geral@egeo.pt

UTM Gasflaschen - UTM Umwelttechnik Metallrecycling GmbH

Alt Herrenwyk 12, 23569 Lübeck

Point of Contact: Tel.: +49 451 30209-40, info@utmluebeck.de

Otto+Leitel GmbH in der Nähe von Berlin (für Emulsionen)

Zum Mühlenfließ 10, 15366 Neuenhagen

Point of Contact: Frau Anke Rieger, Tel: 03342 / 42 47 5 – 15, info@otto-und-leitel.de

For additional information, contact:

Ministry of Environment
Service of Urban Environment

Department of Urban Environmental Protection
Mrs. Olfat Hamdan
Phone: 01 976555 Ext. 448
email: o.hamdan@moe.gov.lb

Lebanon Pollution Abatement Project (LEPAP)

Mr. Marwan Rizkallah
Phone: 01 976555 Ext. 521
Email: m.rizkallah@moe.gov.lb