The ILZSG was set up by the United Nations in 1959 as an intergovernmental organization, and is one of the longest established International Commodity Organizations.

The main role of the ILZSG is to ensure transparency in the markets for lead and zinc worldwide. This is achieved by producing a continuous flow of information to the market place on supply and demand developments in lead and zinc through the monthly publication of high-quality statistics, in-depth market research and specifically targeted economic studies. The Group also organizes international sessions and special conferences bringing together industry and governments to discuss matters of concern in the lead and zinc sectors.

The ILZSG provides opportunities for regular intergovernmental consultations on international trade in lead and zinc, and considers possible solutions to any problems or difficulties which are unlikely to be resolved in the ordinary development of world trade. The Group also publishes continuous information on the supply and demand position of lead and zinc and its probable development and prepares special studies on a range of subjects related to the world lead and zinc market.

The work of the Group is largely carried out by four committees: Standing, Statistical and Forecasting, Mine and Smelter Projects, Economic and Environment. Each committee is chaired by a representative from one of the ILZSG's national delegations, who helps direct the program of work. The committee chairpersons report back to the whole Study Group during formal sessions which are held at its headquarters in Lisbon, Portugal, or by government invitation in a member country.

*Image of Cover Page: Courtesy of International Zinc Association (IZA)*
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SELECTED CURRENT PUBLICATIONS

2. Zinc and Lead Mine and Smelter Database
3. Zinc and Lead New Mine and Smelter Projects 2020
4. Lead and Zinc End Use Industry Statistical Supplement 2020
5. World Directory: Lead and Zinc Mines 2020
6. World Directory: Primary and Secondary Zinc Plants 2020
7. World Directory: Continuous Galvanizing Lines
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14. Risk Factors in Developing Mineral and Metal Projects
15. Social Acceptance for Minerals and Metal Projects
16. The By-Products of Lead, Zinc, Copper and Nickel
17. Environmental and Health Controls on Zinc
Table of Contents

About ILZSG 1
Member Governments 2
ILZSG Officers and Secretariat 3
ILZSG Publications 4
Contents 5
Chapter 1 Zinc Basics 6
Zinc Reserves 8
Zinc Mining Countries 9
World Mine Production 10
Mine Production by Continent 11
Mine Production by Country 12
Major Zinc Miners 13
Mining Capacity Breakdown 14
Aggregate Primary Zinc Production 15
Chapter 2 Zinc Resources 16
Zinc Use Distribution 30
Zinc Use per Capita by Continent 31
Zinc Use per Capita by Country 32
Demographics and Zinc Use 33
Zinc First Use and End Use 34
Zinc Properties and Zinc Use 35
Corrosion and Galvanization 36
Continuous Hot-dip Galvanizing 37
General Hot-dip Galvanizing 38
Process & Application 39
Electro Galvanizing/Zinc Plating 40
Metallizing (Zinc Thermal Spraying) 41
Zinc Rich Paint 42
Mechanical Plating 43
Sherardizing 44
Zinc Die-casting 45
Chapter 4 Zinc Usage 24
Accumulated Zinc Usage 24
World GDP vs Zinc Usage 25
Zinc Usage Countries & Regions 27
Zinc Usage Change 2000 vs 2019 28
Top 10 Users 2019 29
Zinc Use Distribution 30
Zinc Use per Capita by Continent 31
Zinc Use per Capita by Country 32
Demographics and Zinc Use 33
Zinc First Use and End Use 34
Zinc Properties and Zinc Use 35
Corrosion and Galvanization 36
Continuous Hot-dip Galvanizing 37
General Hot-dip Galvanizing 38
Process & Application 39
Electro Galvanizing/Zinc Plating 40
Metallizing (Zinc Thermal Spraying) 41
Zinc Rich Paint 42
Mechanical Plating 43
Sherardizing 44
Zinc Die-casting 45
Chapter 5 Zinc Market & Trade 49
Concentrate Trading Countries 49
Concentrate I & E 2019 50
Concentrate Importers (Americas) 51
Concentrate Importers (Asia) 52
Concentrate Importers (Europe) 53
Concentrate Exporters 54
Zinc Metal Trading Countries 55
Zinc Metal Trade vs World GDP 56
Leading Refined Zinc Importers 57
Leading Refined Zinc Exporters 58
LME Stocks and Prices 59
SHFE Stocks and Prices 60
Chapter 6: EHS of Zinc 61
Occupational Exposure 61
General Population Exposure 62
Zinc Deficiency and Excess 63
Zinc in Soil and Water 64
Order Form of ILZSG Publications 65
Note Page 66
CHAPTER ONE: ZINC BASICS

Symbol: Zn
Atomic number: 30
Atomic Weight: 65.37
Melting Point: 419.5°C
Boiling Point (760mm Hg): 907°C
Modulus of Elasticity: $7 \times 10^4$ MN/m²
Heat of fusion: 7.32 kJ/mol
Heat of vaporization: 115 kJ/mol
Density: 7140 kg/m³ at 25°C
Colour: bluish-white, lustrous

- 23rd most abundant element in the Earth's crust
- 4th most common metal in use after iron, aluminum and copper
- Principal use of zinc is to protect steel from corrosion
- Around 17-18 kg of zinc used in an average car with 7-8 kg on façade, 9-10 kg as die-casting parts and around 2 kg in the rubber tyres
- Zinc provides essential nutrition for fauna and flora, and is recognized as a critical element for child growth and development and the proper functioning of the immune system
- Zinc is a key component in sunscreen
- Zinc is also used as a negative plate in batteries and in gutters and roofing
Zinc blende, also known as sphalerite is the dominant form of zinc ore with wurtzite, smithsonite and hemimorphite as other forms. Zinc ore is currently mined in over 50 countries with China, Australia, Peru, USA, Mexico, India and Bolivia the most important. Aggregated zinc concentrate production for the period of 1960-2019 was over 471 million tonnes. Nowadays an increasing tonnage of zinc today is produced from secondary raw materials (recycling) in the smelters and in other well established technologies, such as re-melting. According to the USGS, identified zinc ore resources (location, grade, quality, and quantity are known or estimated from specific geologic evidence) stand at around 1.9-2.0 billion tonnes with recognized reserves (legally, economically, technically extractable ores) at between 230-250 million tonnes. Many zinc mines are based on mixed sulphide ores containing copper, lead and zinc in varying proportions, often with by-products such as silver, indium, germanium, gallium, bismuth, tellurium and cadmium.
Zinc Reserves

Australia is the country with largest zinc reserves of around 68 million tonnes, followed by China with 44 million tonnes, Russia with 22 million tonnes, Mexico with 22 million tonnes and Peru with 19 million tonnes.

*Reserves refer to resources that are legally, economically and technically feasible to be extracted for a profit in accordance with recognized standards such as JORC, NI 43-101 and SAMREC. Different jurisdictions may develop their own classification code.
➢ Since 1960 over 60 countries have mined zinc ore.
➢ In 2019, 51 countries were actively mining zinc.
Zinc mine production grew from 3.4 million tonnes in 1960 to over 13 million tonnes by 2010 with no significant interruption. More recently output has declined due to low prices and mine closures.
A substantial shift in the geographic origin of zinc mine output has taken place. Before 1990, Europe and the Americas were the major contributors to mine output. Over the period 1990 to 2010 Asian mine output more or less doubled every 10 years.
➢ China is currently the single largest zinc mining country followed by Peru, Australia, India and the USA. The top 10 mining countries contributed 83% of total global zinc concentrate production.
➢ There were 13 zinc mining companies with a capacity higher than 200,000 tonnes/year in 2019.
➢ The company with the largest capacity was Glencore.
The top 10 mining companies contributed to 41% of the world concentrate production capacity, with Glencore taking the lead.
The aggregate global primary refined zinc metal (produced from concentrate only) output over 1960-2019 was 445 million tonnes. The majority of this is still in use.
World refined zinc output recorded its highest ever level in 2015 reaching 13.81 million tonnes. The production decline thereafter was due to mine mothballing and shutdowns as a result of both low prices and end of mine life. Two interruptions in the aftermath of the 2008 financial crisis and 2011 Eurozone debt crisis can also be observed.

Source: ILZSG
➢ 27 countries had zinc metal smelting and/or refining activities in 2019.
The Americas, Asia and Europe are the most important continents for refined zinc production. Output in Europe and the Americas has been relatively stable for a number of years. Production in Asia has become more important mainly due to increased output in China.
Zinc metal production exceeded 200,000 tonnes in fifteen countries in 2019.
The top 10 refined zinc metal producing countries contributed 81% of world total output in 2019 with China’s share at 46%.
➢ By the end of 2019, the world zinc refining capacity totalled 15.6 million tonnes with 15 million tonnes of primary capacity and 600,000 tonnes of secondary capacity. The overall capacity utilization rate was 87% in 2019.
In 2019 about 10% of refined zinc was produced from secondary (recycled) material including scrap, EAF dust and residues from galvanizing process. In addition significant quantities of zinc are recycled from new and old scrap, for example by remelting zinc sheet and die-castings, and by direct use of zinc in the brass and chemical industries.
Secondary refined zinc is produced mainly in Asia, Europe and the Americas. Secondary production in the US is expected to significantly increase in 2020/2021 due to the reopening of American Zinc Recycling’s plant at Mooresboro. Secondary refined zinc is usually recovered through processing EAF dust, Waelz oxide and other mostly oxidic secondary zinc raw materials.
Note: all the quantities in this chapter refer to first use of refined zinc metal.

The aggregate usage of refined zinc metal was 472 million tonnes over the period 1960-2019.
➢ It is interesting to note that in recent years global refined zinc usage has maintained an upward trend despite sharp fluctuations in the world economy, with only minor downward adjustments in 2009 and 2012 resulting from the world financial crisis and deterioration in the Eurozone debt crisis.
Most refined zinc is used in Europe, America and Asia,
The Usage volume in Europe and America has been stable for the observed period,
Usage growth has been mainly in Asia.

Source: ILZSG
The ILZSG statistics recorded first use of refined zinc metal in 75 countries in 2019. However, many of the other countries will also use zinc even if only in very small quantities.
Since 2000 nearly all growth in zinc metal usage has been in Asia, where demand has been primarily driven by growth in China.
China’s annual usage of refined zinc metal is significantly higher than the next nine countries combined.
Geographical Shift of Global Refined Zinc Metal Usage

**Usage Distribution 2000**
- China: 8%
- Europe: 32%
- United States: 28%
- India: 2%
- Korea Rep: 5%
- Japan: 5%
- The Rest: 20%

**Usage Distribution 2019**
- China: 48%
- Europe: 17%
- United States: 6%
- India: 5%
- Korea Rep: 4%
- Japan: 4%
- The Rest: 16%
Refined Zinc Metal Usage per Capita by Continent 2019

Source: UN, ILZSG
Refined Zinc Metal Usage per Capita 2019 for Selected Countries

First Use

kg/per capita

Source: ILZSG

Korea Republic
Australia
Germany
Canada
China
Italy
Japan
Turkey
United States
World Average
Brazil
India

Refined Zinc Metal Usage per Capita 2019 for Selected Countries

0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

First Use

Source: ILZSG
Geographical Allocation of Refined Zinc Metal Usage 2019 by Continent

- Asia: 69%
- Europe: 17%
- America: 12%
- Oceania: 1%

Source: ILZSG

Geographical Allocation of World Population 2019 by Continent

- Asia: 60%
- Europe: 10%
- America: 14%
- Africa: 16%
- Oceania: 0%

Source: UN
Zinc Usage by First Use Application

- Galvanizing: 60%
- Zinc Alloys: 15%
- Zinc Compounds: 11%
- Zinc Semi-manufactures: 4%
- Brass and Bronze: 9%
- Miscellaneous: 1%

Source: ILZSG

Zinc Usage by End Use Sector

- Construction: 50%
- Household Appliance: 6%
- Industrial Machinery: 7%
- Transport: 20%
- Infrastructure: 15%
- Miscellaneous: 2%

Source: ILZSG
## Properties and Uses of Zinc

<table>
<thead>
<tr>
<th>Property</th>
<th>First-Use</th>
<th>End-Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity with iron</td>
<td>Corrosion protection (galvanizing, zinc thermal spraying, electroplating, zinc-rich paints)</td>
<td>Building/construction, energy/power, street furniture, agriculture, automotive/transport</td>
</tr>
<tr>
<td>Corrosion resistance electrochemical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low melting points</td>
<td>Die Casting and gravity casting</td>
<td>Automotive equipment, household appliances, fittings, toys, tools, etc.</td>
</tr>
<tr>
<td>Fluidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity for surface treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alloying characteristics</td>
<td>Brass (copper-zinc alloy), aluminum alloys, magnesium alloys</td>
<td>Building/construction, fittings, automotive and electrical components, etc.</td>
</tr>
<tr>
<td>Formability</td>
<td>Rolled zinc</td>
<td>Building/construction</td>
</tr>
<tr>
<td>Resistance to corrosion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrochemical</td>
<td>Batteries</td>
<td>Automotive/transport, computers, medical equipment, consumer products, energy storage systems</td>
</tr>
<tr>
<td>Chemical</td>
<td>Zinc oxide, zinc stearate</td>
<td>Tyres, all rubber goods, paint pigments, ceramic glazes, electrostatic copying paper</td>
</tr>
<tr>
<td>Essential nutrient</td>
<td>Zinc compounds</td>
<td>Food industry, animal feed, fertilizer</td>
</tr>
<tr>
<td>Healing</td>
<td>Zinc compounds</td>
<td>Pharmaceutical industry, cosmetics industry</td>
</tr>
</tbody>
</table>
Corrosion and Galvanization

➢ Metallurgy is the process of transforming mineral ores into metals, corrosion is the reverse process of metallurgy by which metals tend to revert to their original state after exposure to oxygen, sulfides and carbonates.

➢ Galvanization is a zinc coating process in which the steel surface is coated with a dense and adherent layer of zinc to seal it from exposure to the oxygen, sulfides and carbonates.

➢ The dense and adherent alloy layer on the surface chemically bonds to the steel and tends to corrode in preference to steel thus protecting it from corrosion through both barrier and sacrificial protection.

➢ The idea of galvanization was first proposed by French chemist Paul Jacques Malouin in 1742, the process has been widely adopted since it is patented by another French chemist Stanislas Sorel in 1836.
Continuous Hot-dip Galvanizing

Coiled and rolled steel is galvanized in a molten zinc bath at the steel plant after it leaves the annealing furnaces and a vacuum chamber at the speeds of up to 150 meters a minute. An Air knife is applied on the coating surface to create a uniform coating thickness. The coating layer is mostly pure zinc with the presence of minimal alloying elements. Line capacities can be quite high, exceeding 600,000 tonnes of coated steel per year. This process is very capital intensive and therefore usually carried out by the large integrated steel producers. The galvanized steel sheet, strip and wire are ductile and abrasion resistant and therefore ready for further fabrication before they are used to produce car bodies, household appliances, corrugated steel parts, etc.
Batch (General) Hot-dip Galvanizing

Unlike continuous hot-dip galvanizing, the batch (general) hot-dip galvanizing industry is quite fragmented with many small plants located close to their markets. Costs of entry are relatively low compared to a continuous galvanizing line.

A variation of shapes of steel parts from nuts, bolts and nails to structural steel parts and to complicated steel profiles can all be galvanized through this process. Pre-fabrication and complete immersion creates a uniform, complete coating of the parts surface both interior, exterior as well as complex recesses.
Process and Application of batch galvanizing
Electro galvanizing is a continuous coating process for steel sheet and strip by dipping it in zinc electrolyte-anode such as lead-silver, electrolytes of zinc sulfates or other insoluble anodes. Pure zinc soluble anodes can also be used. The coating develops as positively charged zinc ions in the solution are electrically reduced to zinc metal and deposited on the positively charged cathode (sheet steel). Electro galvanizing only forms a thin layer of zinc up to 0.36 mils (9.1 µm) per side on the steel surface. Zinc Plating is the same process for small parts such as fasteners, crank handles, springs and other hardware items rather than sheet and strip, but with a zinc coating up to a maximum thickness of 1 mil (25 µm). The service life of electro galvanized items is short but with an excellent surface finishing of uniform thickness compared to hot-dip galvanizing, and the coating is highly ductile remaining intact even after severe deformation.
Metallizing (Zinc Thermal Spraying)

After the steel surface has been abrasively cleaned, pure zinc or zinc alloys are loaded into a heated gun and sprayed onto it using combustion gases and/or auxiliary compressed air to provide the necessary velocity. The coating can provide both galvanic cathodic and barrier protection to the steel.

Versatility is one of the biggest advantages of Zinc Thermal Spraying as different coating thicknesses can be applied to different parts of the steel. The process can take place in both the workshop and field. Restriction regarding the size of the steel parts and composition of the steel are therefore removed. In addition, overall, part coating and enhanced coating become possible. Improvements currently being worked on include limitations of coating thickness on corners and edges, the inability to coat interior surfaces, and difficulties in coating recesses and cavities.
Zinc-rich paint is a type of surface coating whereby the coating is bonded to the steel surface mechanically. However, in case of high concentrations of zinc dust, conductivity between zinc particles and the steel may stimulate cathodic protection. Substrate steel should be cleaned to nearly white steel before the organic or inorganic zinc-rich paint is brushed and sprayed onto its surface. Constant agitation and a homogenous mixture of the zinc-rich paint is important to ensure a quality finish.
**Mechanical Plating**

The Mechanical zinc plating process is designed to coat high-strength fasteners and other small parts with less complicated shapes that are not suitable for hot-dip galvanizing. The flash copper coated steel parts are tumbled in a drum filled with zinc powder, proprietary chemicals (activator) and glass beads (impact medium) which peen (glass beads act as ball-peen hammer) zinc powder onto the surface. The coating is mechanically-bonded to the steel so it has less adhesion compared with hot-dip galvanizing.
Sherardizing

Sherardizing is named after the British metallurgist Sherard Osborn Cowper-Coles who invented and patented the method, the process is also known as thermal diffusion galvanizing, dry galvanizing or solid-state galvanizing. Small fabricated articles are charged in a closed rotating drum that also contains metallic zinc powder and sand. At temperatures above 300°C, the zinc evaporates and diffuses onto the steel substrate forming diffusion bonded uniform, hard, abrasion resistant coatings on complex parts.
Zinc Die-casting

Refined zinc is combined with elements, such as aluminum, copper and magnesium to produce alloys for casting applications. Aluminum gives the alloy its mechanical properties, particularly tensile and impact strength. Copper, in small amounts, increases tensile strength and hardness, but reduces ductility, particularly as the alloy ages. Magnesium, in very small amounts, increases hardness, reduces ductility, and offset the effects of metallic impurities, particularly lead, cadmium and tin.

Zinc die casting allows for a high level of precision together with outstanding physical and mechanical properties and low cost. The main advantages are the ability to produce complex shapes with thin walls, excellent tensile strength and dimensional stability, RFI/EMI shielding capabilities, long service life with minimal maintenance and a wide range of finishing options. The strength, fluidity and aesthetics of zinc die-cast alloys make them ideal for many applications including household appliances, car parts, telecommunication equipment and door handles.
Brass and Bronze

Brass is an alloy that consists of copper and zinc. The amount of zinc can range from 5% to 45% depending on the end use. Brass is commonly used for decorative purposes. Its high workability and durability also enable it to be widely used to make musical instruments. The proportion of zinc in brass results in differences in the color and other physical characteristics of the material. If the zinc content of the brass ranges from 32% to 39%, it will have increased hot-working abilities but the cold-working properties will be limited. If the brass contains over 39% zinc, it will have a higher strength and lower ductility at room temperature. Tin is commonly added to brass to inhibit dezincification for good hot forgeability and good cold formability for the manufacture of fasteners, marine hardware, machine parts, pump shafts and corrosion-resistant mechanical products. Bronze is a copper-tin alloy which typically comprises less than 1% Zn. Bronze is used in the construction of sculptures, musical instruments and medals. Its low friction properties also allow it to be employed in industrial uses such as bushings and bearings.
Zinc compounds (Zinc Chemicals)

The main zinc chemicals in current use include zinc oxide, zinc borate, zinc carbonate, zinc chloride, zinc sulphate, zinc sulphide, zinc selenite, zinc powder and nanoform zinc compounds.

Zinc oxide is widely used in the animal feed, pharmaceutical, rubber/tyre, ceramic/glass and electronics industries.

Zinc borate is primarily used in plastics and cellulose fibres, paper, rubbers and the textiles industry.

Zinc sulphate is widely used in the production of fertilizer and animal feeds.

Zinc chloride is mainly use as catalyst in chemical metal production and manufacturing.

Zinc sulphide is used in cathode ray tubes, X-ray screens, and as an optical material and pigment.

Zinc selenite is mainly used in the glass industry.

Zinc powder is used in solution purification in electrolytic zinc plants, alkaline batteries, brake lines, spray metalizing, catalysts, mechanical plating, plastics and pharmaceuticals.

Zinc nanoparticles, nanodots or nanopowder are nano scale zinc chemicals and are used as high-niche materials in a wide range of applications.
Rolled Zinc

Rolled zinc products include sheet, strip, plate, rod and wire, and can include alloying elements depending on the requirements of the end product. These are used in façades, cladding, roofing, gutters and drain pipes, for ornamental applications and as flashing. Rolled zinc products have a long service life of up to 100 years, and can be recycled and reused.

Rolled zinc corrodes at every low rate due to protection from the zinc patina formed by the reaction between the metallic zinc surface, oxygen, rain water and carbon dioxide. The compact, bonded and insoluble patina layer blocks exchange between the atmosphere and the zinc.
CHAPTER FIVE: ZINC MARKET AND TRADE
Geographic Distribution of Zinc Concentrate Importing and Exporting Countries 2019
➢ Over 90% of the world concentrate imports flowed into Asia and Europe
Main Zinc Concentrate importers in the Americas 2015-2019

Source: ILZSG

- Canada
- Brazil
- Mexico
Asia’s Major Zinc Concentrate Importing Countries 2015-2019

Source: ILZSG

- China
- Korea Rep
- Japan

000' tonnes Zn Content

- 2015
- 2016
- 2017
- 2018
- 2019
A large proportion of the imports into Belgium and the Netherlands are forwarded through Antwerp and Rotterdam respectively and exported again to other countries.
Major Zinc Concentrate Exporting Countries 2015-2019

Source: ILZSG
Geographic distribution of Refined Zinc Metal Importers & Exports 2019
The cross-border flow of refined zinc metal is stable in comparison to GDP fluctuations. This helps to explain the fundamentals supporting the zinc market and also why zinc is refined in 27 countries whilst it is used in over 75 countries and regions.
Major Importers of Refined Zinc Metal 2019

Source: ILZSG
Major Exporters of Refined Zinc Metal 2019

Source: ILZSG
LME Zinc Stocks and Prices
Sept 2015 – Sept 2020

US $ per tonne monthly average

Producers + Consumers + LME
LME Cash Settlement Price
SHFE Zinc Stocks and Prices
Sept 2015 – Sept 2020

RMB per tonne monthly average

Producers + Consumers + SRB + SHFE

SHFE Cash Settlement Price

SHFE Zinc Stocks and Prices
Sept 2015 – Sept 2020

RMB per tonne monthly average

Producers + Consumers + SRB + SHFE

SHFE Cash Settlement Price
CHAPTER SIX: HEALTH, ENVIRONMENT AND SAFETY ISSUES

Occupational Exposure

Occupational exposure to zinc occurs in the process of mining, smelting, welding and the manufacture of brass, bronze, or other zinc-containing alloys. The major intake route is inhalation. According to data published by the World Health Organization, typical airborne exposures observed include 0.19–0.29 mg/m³ during the smelting of zinc-containing iron scrap, 0.90–6.2 mg/m³ at non-ferrous foundries and 0.076–0.101 mg/m³ in hot-dip galvanizing facilities.

The US Occupational Safety and Health Administration (OSHA) has set an average legal limit of 1 mg/m³ for zinc chloride fumes and 5 mg/m³ for zinc oxide (dusts and fumes) in workplace air during an 8 hour workday, 40 hour work week. The US National Institute for Occupational Safety and Health (NIOSH) recommends that the level of zinc oxide in workplace air should not exceed an average of 1 mg/m³ over a 10 hour period of a 40 hour work week.

In Europe, the Institute for Health and Consumer Protection of the European Commission coordinated its member states and compiled the European Union Risk Assessment Report on Zinc Metal to provide information about the risks to human health and the environment from over-exposure to zinc. Refer to the links below for document.

Exposure of the General Population to Zinc

The estimated average daily dietary zinc intakes range from 5.6 to 13 mg/day in infants and children from 2 months up to 19 years and from 8.8 to 14.4 mg/day in adults aged 20–50 years. Flesh foods (i.e., meat, poultry, fish and other seafood) are rich sources of readily available zinc, while fruits and vegetables contain relatively low zinc concentrations. For omnivorous adults, more than one-third of dietary zinc can be provided by flesh foods, whereas for vegetarians, plant-based foods are the major dietary source. Mean daily intake of zinc from drinking-water is estimated to be < 0.2 mg/day.

Intakes via dermal and inhalation routes are generally insignificant in the general population. Consumption of dietary supplements of zinc as well as prolonged treatment with pharmaceuticals containing zinc may result in a higher exposure to zinc.

Citation: WHO’s Evaluation of Human Health Risks and Effects on the Environment
Syndromes of Zinc Deficiency include impaired neuropsychological functions, oligospermia, growth retardation, impaired reproduction, immune disorders, dermatitis and impaired wound healing. Most of these effects are treatable with adequate amounts of zinc. Dietary reference values for zinc for adults range from 6 to 15 mg/day. The estimated absolute absorbed amount of zinc for adults is 2.5 mg daily. This implies a dietary need at 20% bioavailability of 12.5 mg daily.

Intentional or accidental ingestion of large amounts of zinc can result in abdominal pain, vomiting and diarrhea. In the case of long-term ingestion of large amounts of zinc, the effects are reversible upon discontinuation of zinc intake and/or repletion of copper because some symptoms result from zinc-induced copper deficiency.

Citation: WHO’s Evaluation of Human Health Risks and Effects on the Environment
Zinc in Soil and Water

Zinc in the form of zinc compounds is an essential nutrition element added to fertilizers to increase crop yields. It has been identified by the UN Food and Agriculture Organization as the most common micronutrient deficiency found in agriculture crops, with nearly 50% of soils being found deficiency for zinc. It is also an important element in agricultural fungicides to protect crops such as cotton, pears, cabbage, apples and broccoli etc.

Natural background levels of zinc occur in all soils; however, enrichment due to industrial activities may affect plant biodiversity as well as micro-organism and invertebrate activity in certain areas.

The average zinc concentration in seawater is 0.6-5 ppb. Rivers generally contain between 5 and 10 ppb zinc. Algae contain 20-700 ppm, sea fish and shells contain 3-25 ppm, oysters contain 100-900 ppm and lobsters contain 7-50 ppm. The World Health Organization reports a legal limit of 5 mg/L for zinc in drinking water.
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<table>
<thead>
<tr>
<th>Publication</th>
<th>Member Countries</th>
<th>Non-Member Countries</th>
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<tbody>
<tr>
<td>Monthly Bulletin &quot;Lead and Zinc Statistics&quot; (including access to Interactive Statistical Database – monthly/annual data 1960 - the current year)</td>
<td>660</td>
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