



CHEMICAL SECTOR PROFILE



The U.S. Chemical Sector consists of tens of thousands of U.S. chemical facilities, ranging from petrochemical manufacturers to chemical distributors, who use, manufacture, store, transport, or deliver chemicals along a complex, global supply chain. Annually, the Chemical Sector produces more than 157,000 individual chemicals and distributes a billion products throughout the nation. Chemicals are essential to modern life, impacting the lives of Americans daily. End users include all other critical infrastructure sectors, making the uninterrupted production and transportation of chemicals essential for national and economic security.

The Chemical Sector is one of the 16 critical infrastructure sectors. The Cybersecurity and Infrastructure Security Agency (CISA) serves as the Sector Risk Management Agency (SRMA) in support of the security and resilience of the chemical industry.

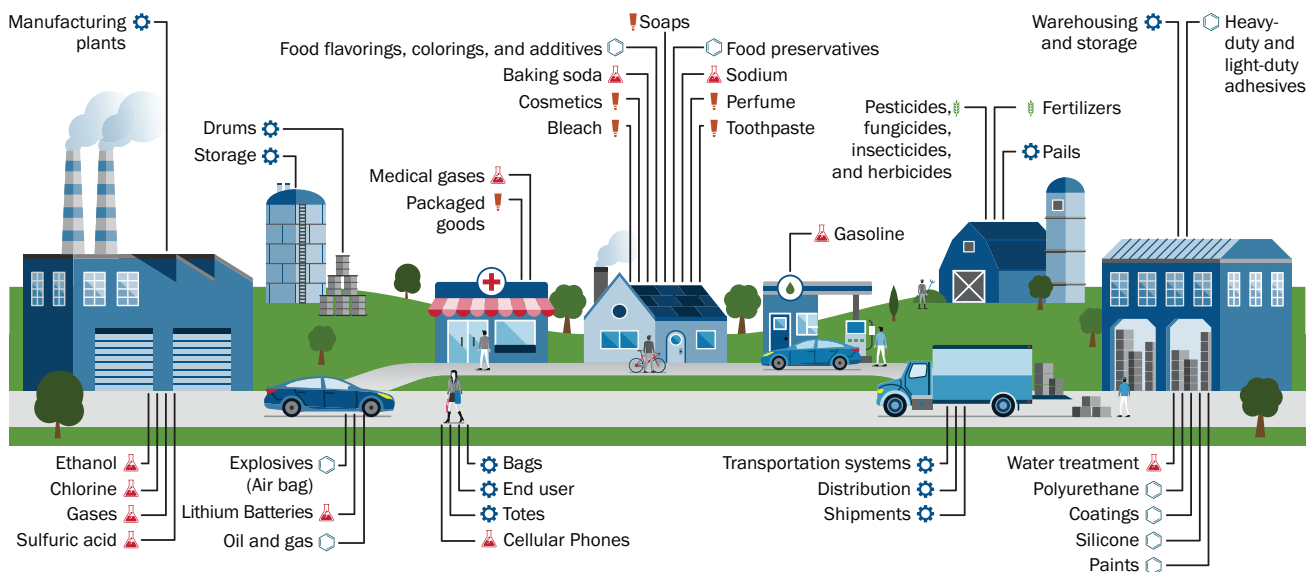
Components of the Chemical Sector

The U.S. Chemical Sector is made up of four components: agricultural chemicals, consumer products, basic chemicals, and specialty chemicals. Each component supports a specific and integral part of America's chemical needs.



The Chemical Sector: Integral to Everyday Life

Nearly all goods in use every day in the United States are manufactured using Chemical Sector products. These goods are found in homes, offices, drug stores, and farms across the nation.



Legend: Agricultural Chemicals Basic Chemicals Specialty Chemicals Consumer Products Functional Areas

Functional Areas of the Chemical Sector

Manufacturing Plants

Convert raw materials into intermediate and end products.



Transportation Systems

Transport chemicals to/from manufacturing plants, warehouses, and end users.

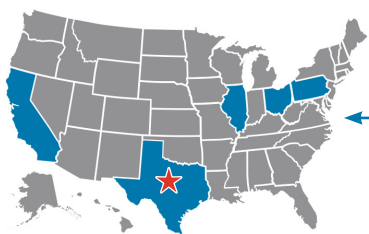
Warehousing/Storage

Provide downsized repackaging and bulk storage.



End Users

Consume the chemical produced.

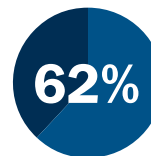


14,601

U.S. chemical manufacturing facilities

States with the greatest concentration of facilities: California, Texas, Ohio, Illinois, and Pennsylvania

★ Texas is the top exporter of chemicals in the U.S. accounting for 32% of all chemical exports.



of chemical manufacturing facilities are owned and operated by **small and medium enterprises** (employ <500 people).

Impact on the U.S. Economy

The U.S. chemical industry supports almost a quarter of the U.S. GDP, helping to drive the production of most commercial and household goods, and is essential to economic growth.



\$673 billion generated annually by the business of chemistry.



Most manufactured goods are directly touched by the chemical sector.



The U.S. chemical industry is the world's second-largest chemical producer.



12% of the world's chemicals come from the United States.

Generation of U.S. Employment

From research and development to manufacturing, the U.S. chemical industry employs 550,000 people, while creating jobs in the many other industries it touches.



550,000

directly employed by the U.S. Chemical Sector



Every job created by the business of chemistry generates
7.4 jobs elsewhere



4.1 million

jobs are supported by the business of chemistry

Contribution to U.S. Exports

The Chemical Sector is one of America's largest exporting sector, accounting for more than 10 percent of U.S. exports.



Total value of U.S. chemical exports in 2024:

\$164 billion

Chemicals and related products make up

10 cents for every \$1 of U.S. exports



AGRICULTURAL CHEMICALS

The agricultural chemical industry supplies farmers and home gardeners with fertilizers, herbicides, pesticides, and other agricultural chemicals. This segment includes companies involved in the formulation and preparation of agricultural and household pest control chemicals, as well as companies responsible for manufacturing and storage.



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\$33.5 billion

in chemical sales to the agriculture industry in 2023



1,049 facilities

as of 2022



\$48.2 billion

total value of shipments distributed

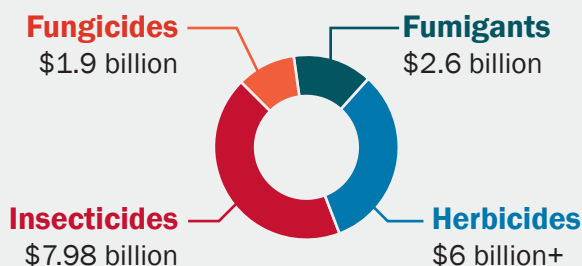


40,000+ employees

as of 2024

Pesticides

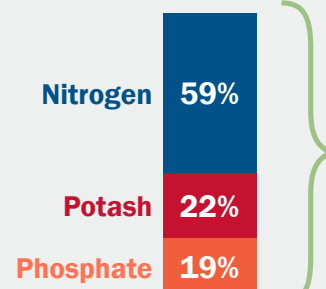
The U.S. pesticide market is estimated at more than **\$22 billion**.



Fertilizers

The U.S. fertilizer market was estimated at **\$29.3 billion** in 2024.

The consumption of agricultural fertilizers in the United States has remained fairly stable over the last decade. In 2023, it stood at nearly **20.5 million** metric tons.



CONSUMER PRODUCTS

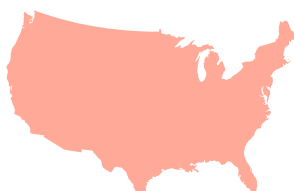
Consumer products include packaged products often referred to as “household products.”

This segment includes soaps and detergents; oral hygiene, hair, and skin care products; and personal care products (e.g., cosmetics, deodorants).



The U.S. consumer packaged goods market is estimated at

\$1.5 billion



\$89.8 billion total value of shipments distributed



In 2022 the average U.S. consumer spent **\$85.37** on soaps and detergent.

Soap, Cleaning Compounds, and Toilet Preparation



2,558 facilities



119,000 employees

BASIC CHEMICALS

The **basic chemicals segment produces both inorganic and organic chemicals**. Organic chemicals are used in the production of other chemicals and to make products such as dyes, plastics, and **petrochemical products**. Inorganic chemicals usually are used to make solid and liquid chemicals and **industrial gases**; sodium, **sulfuric acid**, and **chlorine** are some of the most common. Inorganic chemicals also serve as catalysts in the manufacture of chemicals (used to speed up or aid a reaction).



2,645
facilities



159,000
employees



\$3 billion
total revenue value of
shipments distributed



Petrochemical

There are **441 refineries** and petrochemical facilities across 44 states.

 The U.S. refining industry processes a total of 13.4 million barrels of crude oil per day.

Petrochemical plants produce resins that are used in a wide variety of products:

- Car parts
- Food packaging containers
- Water bottles
- Medical devices

Sulfuric Acid

8 million

metric tons of elemental sulfur is produced each year.



of which is consumed in the form of sulfuric acid.

Used to make hundreds of compounds needed by almost every industry; uses of sulfuric acid include:

- Chemical manufacturing
- Domestic and industrial cleaning products
- Metal Processing
- Agriculture and fertilizer
- Batteries

Chlorine

In 2019, the U.S. produced **10 billion kilograms** of chlorine.

In 2024, United States exported **\$13 million** of chlorine.



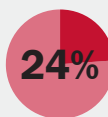
The broader chlor-alkali industry employs more than **48,000 people**.

Uses of chlorine include:

- PVC
- Water sanitation
- Solvents
- Pulp and paper industry
- Organics
- Inorganics

Industrial Gases

The global industrial gas market was valued at **\$96.52 billion** in 2022.



accounted for by North America



19,480 employees

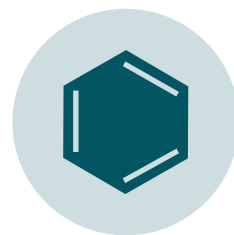
Each job generates **2.1 more jobs** elsewhere in the economy, contributing **\$25.06 billion to the U.S. economy**.

Industrial gases are used in a **wide variety of applications**, including:

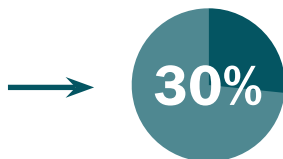
- Medical
- Food & Beverage
- Electronics
- Manufacturing
- Industrial

SPECIALTY CHEMICALS

Specialty chemicals are individual molecules or formulated mixtures designed to deliver specific performance characteristics or functions for targeted applications, rather than being produced in large volumes as standardized chemical inputs. Many other sectors rely on specialty chemicals for their products, including automotive, aerospace, agriculture, cosmetics, and food.



Strong industrial output and advanced R&D drive elevated demand for specialty chemicals in North America. The **market share** for specialty chemicals in North America is **significantly higher** than the global average.



\$93.1 billion total value of shipments distributed

Adhesives and Sealants



Acrylates/anaerobic adhesives

Adhesive used to keep nuts tight on bolts



Amino resins

Bonding of layers in plywood and of particles in a particle board



Animal glue

Binding of abrasives in sandpaper and other grinding materials



Butyl rubber/isobutylene

Additive for hot-melt and pressure sensitive adhesives and window sealants



Casein

Labels on bottles that stay on in ice water and are recyclable



Polyolefin/ethylene copolymer

Hot melts



Polyurethane

Bonding soles to the bodies of shoes; food packaging



Polyvinyl acetate

Book bindings and labels



Natural rubber

Self-adhesives (e.g., envelopes)



Paints

Vehicle paint, traffic marking paint, food paints



Silicone

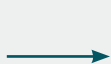
Bathtub and shower sealants, car applications



Starch

Corrugated cardboard bonding

Paint, coating, and adhesive manufacturing



 **62,000 employees**

Food Additives

The Food and Drug Administration currently lists **3,971 food additives** approved for food use in the United States.



Preservatives

(e.g., propionic acid, nitrates, benzoates)



Flavorings

(e.g., fruit flavors, sweeteners, butter flavors)



Processed food additives

(e.g., potassium sorbate, propylene)

Flavors and Fragrances



\$30.61 billion in total value.

Explosives

4.5 billion tons of explosives used in the United States

- Fragmenting rock formations for oil and gas extraction
- Blasting during mining and quarry processes
- Inflation devices such as vehicle airbags

REGULATORY

As most Chemical Sector assets are privately owned and operated, effective security and resilience planning requires a shared commitment between the public and private sectors to implement the most effective risk management strategies throughout the sector.

Federal Agencies

Federal agencies regulate the **manufacturing, storage, processing, transportation, and use of chemicals*** through the following mechanisms:

Department of Homeland Security

U.S. Coast Guard



Under the Maritime Transportation Security Act (MTSA), regulated facilities, including **452 chemical facilities**, are required to establish security plans to mitigate risks.

Transportation Security Administration



Rail Transportation Security Final Rule – **46 key urban areas covered by secure chain-of-custody inspections.**

Department of Transportation

Pipeline and Hazardous Materials Safety Administration



937,016 shippers covered by the security plan and training requirements.

Department of Health and Human Services

Food and Drug Administration



More than **\$2.9 trillion worth of products** produced in the United States and abroad.

Department of Labor

Occupational Safety and Health Administration



In FY 2024, OSHA conducted **34,625 inspections** of chemical manufacturing facilities.

Environmental Protection Agency



Oversees approximately **12,500 facilities that produce, use, or store significant quantities of chemicals.** These regulations are crucial for managing the risks associated with chemical manufacturing and use, including potential impacts on air and water quality, waste management, and emergency response preparedness.

Department of Justice

Bureau of Alcohol, Tobacco, Firearms, and Explosives



9,185 active federal explosives licenses and permits.

*The regulatory scope of these agencies/programs extends beyond the domain of the Chemical Sector.



In addition to federal regulations, **the chemical industry is subject to any regulations states might impose** on facilities doing business within their boundaries.

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