We develop, design and manufacture industrial furnaces and equipment for a variety of heat treatment processes. We supply leading technology to the Hot-Dip Galvanizing industry.
The depth of our experience is to custom engineer heat treating equipment for demanding applications. We pride ourselves in providing innovative, state-of-the-art equipment that helps our customers improve their bottom line and gain a competitive edge.

Innovation is essential for our company. We are continuously improving and optimizing our technology, building “custom made” heat treating equipment through systematic innovation.

Offering only the best in customer service has earned C. H. Evensen Industrievner AS a recognized and enviable reputation. A team of skilled and committed engineers are available around the clock, 365 days a year to offer service and support to customers around the globe.

CHE has subsidiary companies, UAB Termoskalé in Lithuania and Evensen Furnaces AB in Sweden. The CHE production sites are in Fredrikstad, Norway and Utena, Lithuania. Today we have more than 4000 installations in more than 45 countries worldwide.
Modernizations

Evensen can offer furnace renovations and modernizations for capacity, energy and environmental improvement measures in accordance with applicable safety requirements based on current directives and standards.

Production and installation

Evensen has a modern workshop with an experienced workforce, with more than 50 employees in Norway and Lithuania. This includes our In-House electrical department where control boards, control systems and heating elements are designed built and tested. Our engineers keeps a close follow-up of our products throughout production, installation and commissioning. This ensures that our deliveries will be in accordance with the specified requirements, and our engineering department will always be updated with new experience and the latest developments.
For clients that wish to maintain a secure operation of their equipment. Evensen can make service agreements where the performance and status of the equipment is tested and controlled at regular intervals. We can also modernize and refurbish existing furnaces, with modern equipment such as new control systems, higher degree of automation, efficient heating systems, low energy loss thermal linings, solutions for increased capacities etc.

Further, we are able to supply and install special components such as heating elements, burners, thermocouples, furnace fixtures, conveyors, temperature resistant materials, blowers etc., also for heating equipment that has not been delivered by us.
Hot-Dip Galvanizing History

The innovation of ceramic furnaces made high temperature galvanizing possible. High temperature galvanizing is applied at spin work plants for galvanizing of threaded products, nails, brackets and various fasteners. CHE pioneered ceramic galvanizing furnaces as early as 1948 and has installed one of the largest galvanizing furnaces in the world with 1100 tons of zinc. We have installed more than 120 ceramic furnaces worldwide.

Originating from an area where electricity is the prime energy source, we have had the opportunity to gradually develop our heating systems to a very high level of efficiency, long life and secure operation. Both the Silicote® immersion heating rod and radiant wall for steel kettles were innovated in our engineering department.
30 Years Experience in Automatic Ash Skimming Systems

The first company in the world that successfully designed a fully automatic ash skimming system for a galvanizing furnace. The quality and repeatability of the system has been proven in automated Hot Dip Galvanizing lines for automotive Components.
Turn Key Hot-Dip Galvanizing Plants

In close collaboration with other specialists in their field, we supply turnkey galvanizing plants based on efficient handling systems and state of the art cleaning plants.

Energy Recovery
Through computerized programs we calculate heat exchangers for flue gases, energy loss reductions and optimal heat transfer conditions.
Our technical support is available 24 hours per day, and we use PLC / modems for online troubleshooting and service. We can make service contacts with our clients and are available for all maintenance works, repairs and kettle changes.

We have our own engineering department where our products undergo continuous development. With innovative design concepts and visions CHE has been the pioneers in many fields of Hot Dip Galvanizing.

**Computerized design**
Today we apply 2D and 3D design tools for drawings and illustrations. We use computer programs for energy balances, heat and gas flow simulation and calculation of kettle strength and energy load.
Electric Resistance Heated Hot-Dip Galvanizing Furnace with Radiant Wall

Removable Heating Elements
The kettle is heated through a system of separate panels with ribbon heating elements from Cr20Ni80 alloy. There is one connection terminal only for each panel. The panels can be removed separately for service with minimal interruption of production.

Radiant Wall with Reduced Risk of Hot Spots
The system of heating panels creates a radiant wall against the kettle. This ensures optimal conditions for extended life of the kettle.

Minimum Heat Losses and High Efficiency
The furnace is lined with high temperature ceramic fibre, to minimize the heat losses from the furnace. The kettle top flange is insulated in order to reduce heat emission from the flange surface. Electric resistance heating results in high thermal efficiency. No energy loss due to cooling equipment as with induction heating and no flue gas heat loss as with combustion heating.

Furnace and Kettle as Separate Units
The furnace is constructed as a separate unit. The steel kettle can be lifted out without removing the heating system or furnace walls.

Temperature Control on Kettle Wall
The temperature control is through indirect measurement of the zinc temperature.

Two Zone Temperature Control
The heating system can easily be divided in two zones, upper and lower zone. This can reduce possible top dross problems.

Safety Features
The control is through a PLC with a GSM modem or VPN connection. There are separate controllers for temperature protection and a Zinc leakage warning system.
01 Furnace and steel kettle are separate units
02 Heating system is separated from the kettle
03 Simple and easy work when changing kettle
04 Low energy consumption due to small heat losses
05 Long life of heating elements
06 Heating system is accessible from the outside
07 Heating elements are easily repairable
08 Thermocouples are installed in the kettle wall, not the zinc
09 The bath temperature is controlled in 2 zones, thus reducing risk of top dross
10 Zink leakage warning system
11 Flexible furnace construction can be enlarged to accommodate larger kettles
Gas Fired Recirculation Furnace with High Velocity Pulse Fired Burners

The burner flames are short and the kettle is equipped with insulated heat shields. The danger of hot spots is eliminated.

The temperature of each firing lane is monitored by a separate temperature controller.

Gas and air flows can be metered and the pressure is monitored by pressure switches. The furnace is lined with a ceramic fibre wall, ensuring that the heat losses from the outer furnace walls are very low.

The furnace is constructed as a separate unit. The steel kettle can be lifted out without removing the heating system or furnace walls.
PLC / Modem
All our furnaces are controlled from a PLC unit equipped with a modem for GSM or VPN connection with our office. This enables quick troubleshooting in case of operational failure.

Temperature control
The temperature control is through indirect measurement of the zinc temperature, no thermocouples immersed in the zinc bath.

Optional two zone regulation
The heating system can easily be separated in two zones, upper and lower zone. This can reduce possible top dross problems.

Supervision of the kettle temperature
To protect the kettle against overheating, the control system is equipped with temperature monitoring of the kettle wall.

Warning system for zinc leakage
The furnaces is equipped with a warning system, if Zinc should leak from the kettle.

Our furnaces are standard with pulse firing technology.
The many advantages of ceramic lined galvanizing baths should be well known to most galvanizers. The fact that molten zinc does not form a chemical composition with refractory materials, as it does by formation of zinc ferrite with iron in a steel kettle, prevents the inconvenience and high cost of kettle changes, as ceramic lined baths will have an indefinite life.

The ceramic lined galvanizing baths have over the years been subjected to continues developments. These have mainly been directed towards the design of the refractory lining, the refractory materials and the steel structure supporting the zinc and the refractories.

Most of the development work in this field has been carried out by C.H.Evensen. The long life of ceramic lined galvanizing baths of C.H.Evensen design, proves that any possibilities of zinc leakage or zinc penetration through the refractory lining due to thermal expansions and high hydraulic pressure, has been abolished, even at high temperature galvanizing.

Top heated baths of C.H.E. design have been in continuous operation for nearly fifty years without any damage of the refractory bath lining. C.H.E. has know how and experience from installation of gas, oil and electric heated top heated baths of depth up to 2,8 m and length up to 17,5 m.

High temperature galvanizing at 560°C is used for galvanizing small components such as fasteners, threaded bolts, nails and brackets. High temperature galvanizing gives uniform and controllable coatings, also to silicon and aluminium killed steels.
The development of the Silicoat® immersion heating rod has enabled a new concept for electric resistance heating of metals. With the unique physical and electrical properties of the rod, it can be installed directly in molten metals.

The total energy from the Silicoat® immersion rod is transferred directly to the metal by conduction. Hence, there is no energy loss from the energy source.

The Silicoat® immersion heating rods are applicable to the proven CHE design of ceramic lined galvanizing baths.

The voltage applied to the rods is limited to 50V, being transformed from line voltage through a multistep transformer.

The zinc temperature is controlled by PLC-unit with modem, connected to thyristors in the supply voltage line.

Silicoat® immersion heating rods and Ceramic Lined Galvanizing baths contribute to high thermal efficiency of the heating system, high power installations for high production rates in small zinc volumes and long life galvanizing bath.

High temperature galvanizing up to 610°C is used for galvanizing small components such as fasteners, threaded bolts, nails and brackets. High temperature galvanizing gives uniform and controllable coatings, also to silicon and aluminium kitted steels.

The Silicoat® – Ceramic Lined Galvanizing Furnace with Immersion Heating Rods
Topfired Ceramic Lined Galvanizing Furnace

vs

Ceramic Lined Galvanizing Furnace with Immersion Heating Rods (Silicoat®)

Topfired

- Zinc volume: 130 tons
- Installed power:
  - 470kW (electric)
  - 785kW (gasfired)
- Annual energy consumption:
  - 1.875.000kWh (electric)
  - 2.885.000kWh (gasfired)
- Production area: L x W x D: 5.600 x 1.200 x 1.200mm
- Production capacity: 2.65 tons/hour
- Annual production: 8280 tons

Outer dimensions:
- L x W x D: 7.250 x 5.500 x 3.100mm
Silicoat®

- Less energy consumption
- Less zinc volume (up to 60%)
- Less losses from furnace construction
- Less space needed

Topfired
- Higher zinc volume (due to heat transfer surface)
- Higher losses from furnace construction
- More space needed

**Annual energy consumption**
1.625,500 kWh

**Production area**
L x W x D: 5.600 x 1.200 x 1.200mm

**Zinc volume**
68 tons

**Installed power**
440 kW

**Production capacity**
2.65 tons/hour

**Annual production**
8280 tons

**Outer dimensions**
L x W x D: 5.600 x 1.200 x 1.200mm
Hot Air Dryers for Galvanizing

**Hot Air Recirculation**
C.H.E.’s design of dryers with recirculating air is based on know-how and experience from forced recirculating furnaces in the metallurgical industry with high efficiency heating and temperature uniformity.

**Any Energy Source can be Applied**
The energy can be supplied to the recirculating air system by direct electric or gas heating of the air or through the supply of *super-heated air from heat exchanging the flue gases* from a gas or oil fired galvanizing furnace.

**Covers and Lids**
For reduced energy consumption’s or for high temperature operation, the dryers can be equipped with covers or doors with automatic drives. The C.H.E. dryers are equipped with automatic temperature control systems.

**Recirculation Fans**
The dryers are equipped with recirculation fans which supply the dryer with high velocity air through air nozzles in the air supply channels. Separate air channels return the recirculating air to the recirculation fans.

**Reduced Zinc Consumption**
The installation of a dryer will result in considerable reduction of flux fume and zinc splashes during the dipping. Further, the zinc consumption and the formation of dross and zinc ash is reduced and the production capacity of the galvanizing plant will be increased.

**Turbo Dryer**
Our turbo dryer is designed for extremely short heating-up time, and is equipped with high velocity air and heating power. Applied in special alloy galvanizing.

---

Fume Capture Plant with Optional Integrated Cover Lid

The fume capture plants from CHE are custom designed solutions. The design will vary with the plant layout, handling system and operator positions.

All enclosures are designed for max. capture of zinc fumes and for the best and cleanest environment possible in the galvanizing plant. The enclosure can be operated through the PLC-unit of the galvanizing furnace. With a modem, troubleshooting and service can be carried out on-line.

Extraction ducts are positioned for efficient transport of the fumes to the zinc dust separator.

All doors and moving parts are designed for max. Safety of the operator, doors are for example locked in their positions and are monitored by electronic switches.

As the hood also will capture a lot of zinc splashes, easy cleaning is given much attention in our solutions. But most important is easy access to the zinc area and the work being galvanized.
Products and Services

- Custom made equipment
- Turn-key installations
- Service 24 hours
- Renovations and repairs
- Furnace control and calibration
- Automatic integrated kettle covers
- Kettle support systems
  inkl. 3D modeling and calculations
- Pump-out assistance / service
  optional with containers

- Fume filters
- Centrifuge machines / systems
- Ultrasonic kettle testing, without
  the need to remove zinc
- Chemical treatment equipment
- Drossing grabs
- Zinc pumps