

Hot Dip Galvanizing (HDG)

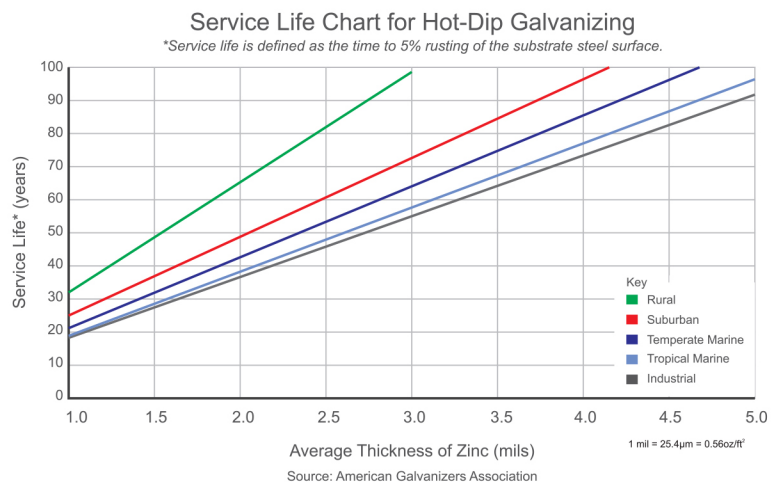
Hot-dip galvanizing (HDG) is one of the oldest and most commonly used method of protecting steel fasteners from corrosion. HDG coating is relatively maintenance-free and provides excellent corrosion protection to steel structures for 50-75 years in most atmospheric environments (industrial, urban, marine & rural).

HDG provides two types of corrosion protection: barrier and galvanic (cathodic). It protects steel by acting as a semi-impermeable barrier to the environmental elements that cause corrosion.

Technical Information

Type of Material	Steel
Process Temperature	460°C - 550°C
Maximum service temperature without damage of coating	300°C max
Usual thickness	Individual - 43µm Average - 54µm
Average Friction Coefficient	Seizure risks when bolt stress is > 40% YS
	(without lubricant)
	(with lubricant)
Hydrogen embrittlement	Descaling with inhibitor. No risk process
Aspect	Matt or Glossy

Further, because zinc is more reactive than steel, the zinc galvanized coating “sacrifices” or corrodes first, protecting the steel substrate. The rate of corrosion of zinc is at least 10 times slower than that of steel, thus a thin coating of zinc can protect steel for long time.



Hot-dip galvanizing process starts with carefully cleaning the fastener surface & remove organic contaminants like dirt, grease or oil. Scale and rust are removed by pickling it in a dilute solution of heated sulfuric acid or an ambient temperature hydrochloric acid solution. The fasteners then go through another clean water rinse.

After thoroughly cleaning, the parts are dipped in a flux tank typically containing an aqueous solution of zinc ammonium chloride. This fluxing removes oxides and prevents further oxides from forming on the steel surface prior to galvanizing. Fluxing also promotes bonding of the zinc to the steel surface.

The galvanizing phase of the process requires that the fasteners are completely immersed in a molten bath consisting of a minimum of 98% pure zinc at a temperature

between 460°C to 525°C. After slowly withdrawing the parts from the molten zinc, the fasteners are spun in a centrifuge, while the zinc is still liquid, to remove excess zinc. The parts are then either air or water cooled to solidify the zinc and to permit handling.

The final phase of the process is inspection. Unbrako production facilities are ISO 9001, ISO/TS 16949, ISO 14001, and BS OHSAS 18001 certified. At Unbrako, we take a number of precautions to make sure our fasteners meet or exceed governing specifications. Further, full traceability to the original manufacturing lot number is available.

