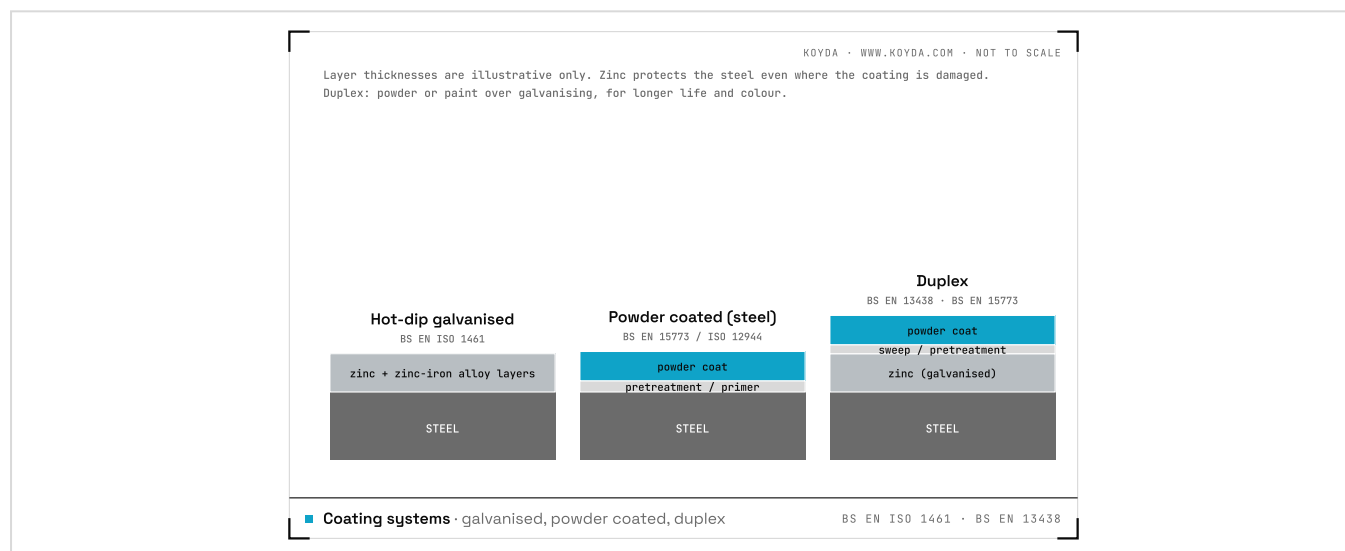


| ITEM            | HOT-DIP GALVANISING             | POWDER COATING                   | DUPLEX                             | SOURCE                                 |
|-----------------|---------------------------------|----------------------------------|------------------------------------|----------------------------------------|
| What it is      | Steel dipped in molten zinc     | Powder sprayed on and oven cured | Powder (or paint) over galvanising |                                        |
| How it protects | Barrier plus sacrificial zinc   | Barrier only                     | Both                               |                                        |
| Colour          | Silver grey, dulls over time    | Any RAL colour and gloss         | Any RAL colour and gloss           |                                        |
| Damage          | Zinc protects small scratches   | Rust can creep under chips       | Zinc under the coat protects       |                                        |
| Thickness       | 85µm min mean on steel over 6mm | Set by the specification         | Zinc plus coat                     | <a href="#">BS EN ISO 1461 Table 3</a> |
| Main standard   | BS EN ISO 1461                  | BS EN ISO 12944 (paint systems)  | BS EN 13438, BS EN 15773           |                                        |
| Lead time       | Adds a trip to the galvaniser   | Usually shortest                 | Longest: both processes            | <a href="#">Qualitative</a>            |
| Cost            | Moderate                        | Usually lowest                   | Highest first cost                 | <a href="#">Qualitative</a>            |



## Corrosivity and galvanising life

| CATEGORY | CORROSIVITY | TYPICAL ENVIRONMENT                           | ZINC LOSS (MM/YR) | ESTIMATED LIFE, 85MM |
|----------|-------------|-----------------------------------------------|-------------------|----------------------|
| C1       | Very low    | Heated interiors                              | ≤0.1              | More than 100 years  |
| C2       | Low         | Rural areas, unheated buildings               | 0.1–0.7           | More than 100 years  |
| C3       | Medium      | Urban and light industrial, low-salt coastal  | 0.7–2.1           | 40 to over 100 years |
| C4       | High        | Industrial, coastal                           | 2.1–4.2           | 20–40 years          |
| C5       | Very high   | Aggressive industrial, coastal with high salt | 4.2–8.4           | 10–20 years          |
| CX       | Extreme     | Offshore, extreme industrial                  | 8.4–25            | 3–10 years           |

First-year zinc rates from BS EN ISO 9223; life = 85µm ÷ rate. Estimates, not guarantees.

## Galvanising thickness (BS EN ISO 1461)

| ARTICLE                  | LOCAL MIN (MM) | MEAN MIN (MM) |
|--------------------------|----------------|---------------|
| Steel over 6mm           | 70             | 85            |
| Steel over 3mm up to 6mm | 55             | 70            |
| Steel 1.5mm up to 3mm    | 45             | 55            |
| Steel under 1.5mm        | 35             | 45            |
| Castings 6mm or more     | 70             | 80            |
| Castings under 6mm       | 60             | 70            |

## Paint and powder durability

BS EN ISO 12944-1 sets durability ranges to the first major maintenance: low (up to 7 years), medium (7 to 15), high (15 to 25) and very high (over 25). These help choose a system. They are not guarantees.

## Common questions

### Is galvanising better than powder coating for outdoor steel?

For corrosion protection alone, galvanising usually lasts longer because the zinc protects the steel even where it is scratched. Powder coating on bare steel relies on an unbroken film. For colour and long life outdoors, a duplex system (powder over galvanising) is the usual choice.

### Can you powder coat galvanised steel?

Yes. This is a duplex system. The galvanised surface needs the right preparation before coating, and BS EN 13438 and BS EN 15773 cover the powder and its application. Use a coater who works to these standards to avoid poor adhesion or pinholes.

### How long does galvanising last?

It depends on the coating thickness and the environment. Using first-year zinc corrosion rates from ISO 9223, an 85 micron coating could last more than 100 years in a dry rural (C2) setting, roughly 20 to 40 years in a C4 coastal or industrial setting, and less in harsher marine conditions. These are estimates, not guarantees.

## Sources

- Galvanizers Association: BS EN ISO 1461 coating thickness requirements · <https://galvanizing.org.uk/galvanizing-standards/iso-1461/>
- BS EN ISO 9223:2012 corrosion of metals and alloys: corrosivity of atmospheres (BSI)
- BS EN ISO 12944-1 and -2:2017 paints and varnishes: corrosion protection of steel structures by protective paint systems (BSI)
- BS EN 13438:2013 powder organic coatings for hot dip galvanised or sherardised steel products for construction purposes (BSI)
- BS EN 15773 industrial application of powder organic coatings to hot dip galvanised or sherardised steel articles (duplex systems) (BSI)
- American Galvanizers Association: how long does hot-dip galvanizing last · <https://galvanizeit.org/hot-dip-galvanizing/how-long-does-hdg-last>
- American Galvanizers Association: duplex systems, synergistic effect · <https://galvanizeit.org/duplex-systems-galvanize-it-seminar/why-duplex/synergistic-effect>
- Galvanizers Association: duplex coatings · <https://www.galvanizing.org.uk/duplex-coatings/>

Full guide: [www.koyda.com/guides/galvanising-powder-coating-duplex/](http://www.koyda.com/guides/galvanising-powder-coating-duplex/)

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