ArmorGalv®
THERMAL DIFFUSION GALVANIZING
Environmentally friendly corrosion protection

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01/08/2013

Thermal Diffusion Galvanizing Coating Thickness Requirements

HOT DIP GALVANIZING REQUIREMENTS FOR COATING THICKNESS AND MASS FOR ARTICLES THAT ARE NOT CENTRIFUGED ACCORDING TO AS/NZS 4680

(Bar, Friction bolts, items generally over 1m long)

Article thickness mm	Local coating thickness minimum µm	Average coating thickness minimum µm	Average coating mass minimum g/m ^{2}	Thermal Diffusion Galvanizing Equivalent Average Coating Thickness minimum microns
<1.5	35	45	320	25
>1.5 <3	45	55	390	30
>3 <6	55	70	500	40
>6	70	85	600	50

HOT DIP GALVANIZING REQUIREMENTS FOR COATING THICKNESS AND MASS FOR ARTICLES THAT ARE CENTRIFUGED ACCORDING TO AS/NZS 4680

(Nuts, bolts, plate washers, couplers)

Thickness of articles (all components including castings) mm	Local coating thickness minimum µm	Average coating thickness minimum pm	Average coating mass minimum g/m ^{2}	Thermal Diffusion Galvanizing Equivalent Average Coating Thickness minimum microns
<8	25	35	250	25
>8	40	55	390	30

Thermal Diffusion Galvanizing (TDG) and Hot Dip Galvanizing (HDG) are the only two coatings available that are created by zinc diffusion. Zinc atoms diffuse into the steel substrate and combine with iron atoms to form a zinc / iron alloy layer on the steel surface.

With HDG, the diffusion time is about 2 minutes; depth of diffusion into the substrate is 1 micron, average iron content in the coating is about 2% and the average coating hardness of the alloy layers is about 250 Vickers. When an item is withdrawn from a molten HDG bath, pure zinc solidifies on top of the alloy layers and generally makes up half the coating thickness.

With TDG, the diffusion time is about 2 hours; depth of diffusion into the substrate is 10 micron, average iron content in the coating is about 18% and the average coating hardness is about 400 Vickers. TDG consists of alloy layers only; there is no pure zinc on the surface.

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TDG will generally last 2 to 3 times longer than an equivalent coating thickness of HDG. This is due to 4 factors.

TDG alloy layers contain a greater percentage of iron atoms linked with zinc atoms, so are more stable and exhibit lower corrosion rates.

HDG coatings have pure zinc on their outer layer which is unstable and usually breaks down rapidly in a corrosive environment.

TDG is passivated with zinc phosphate as part of the coating process which adds further stability and corrosion resistance.

ArmorGalv applies additional top coat sealers over the TDG for added corrosion protection.

TDG coating thickness can be controlled accurately to either reduce or increase performance in line with specific requirements.

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