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Rostfrei Make Zincalume Steel Silos "The Future of Grain Silo Industry"

How Rostfrei make silos are different from silos made by other Grain Silo Suppliers?

Rostfrei make silos are more suitable for tropical and sub-tropical regions like India as they are made of Zincalume Steel and Colorbond Steel. Zincalume steel and Colorbond Steel Silos performs far better than conventional GI Steel silos in India like climates. In Colorbond Steel one can choose any color to match existing color theme of customer's factory.

Figure 1 : 300 MT Paddy Silos in Sonepat

What is Rostfrei make Zincalume Steel and how it is different from GI Steel?

Grain Silos are fabricated in following four Metal Coated Steels

- GI Steel -99.7% Zinc + 0.2% Aluminum Coating
- Galfan - 95% Zinc + 5% Aluminum Coating
- Magnelis - 93.5% Zinc + 3.5% Aluminum + 3% Manganese Coating, and
- Zincalume - 43.5% Zinc + 55% Aluminum + 1.5% Silicon Coating

Galfan, Magnelis and Zincalume all perform better than GI Steel as they are better materials for long term storage of grains in Silo.

ZINCALUME Steel has Alloy coating of **55% aluminium**, **43.4% zinc** and **1.6% silicon** which is carried out at 600 Deg C, hence more uniform and strong. Zincalume is the best material for long-term storage of grains as it has excellent **Thermal Reflectivity, Corrosion Resistant, Lightweight and Stronger** than conventional Galvanised steel material.

What are the problems associated with GI Steel Silos?

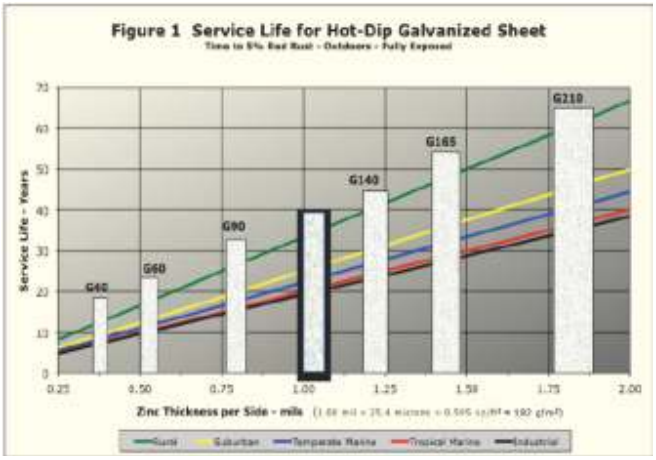
The biggest problem is that the average service life of GI Steel Silos is very less. GI Steel have metal coating of 99.7% Zinc over mild steel which is carried out at 450 Deg C. Zinc Coating saves mild steel from getting corroded. Zinc reacts with atmospheric oxygen in the presence of humidity and form Zinc Oxide. Zinc protects base metal mild steel by sacrificing itself, which means by converting itself to Zinc Oxide. Eventually with the passage of time whole of zinc coating gets sacrificed and base metal mild steel is exposed and thereafter corrosion is very fast.

Since zinc reacts with atmospheric oxygen only in the presence of humidity in the air. Wherever the humidity is more the reaction is fast and wherever it is less reaction is slow. Warmer air has more capability to hold moisture and colder air has less capability to hold moisture. Hence GI performs better in colder climates than in warmer climates hence more popular in countries where the climatic is cold most of the time.

In tropical and sub-tropical regions since the air is very humid, GI does not perform to its expectations.

Average Service Life of of GI Steel silos is as mentioned in the table below;

') 3¥$Y	G40	G60	G90	G115	G140	G165	G210
Oz/ft2	0.4	0.6	0.9	1.15	1.4	1.65	2.1
g/m2	122	183	275	351	427	504	641
Service Life	7-9 Yrs	10-12 Yrs	15-18 Yrs	20-23 Yrs	24-27 Yrs	28-32 Yrs	36-41 Yrs

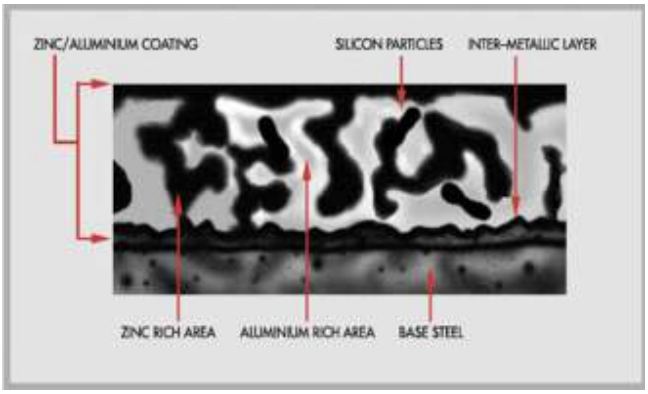


Note : - Indian Climate fall between Temperate Marine and Tropical Marine

How Rostfrei Make Zincalume solves the corrosion problems

ZINCALUME Steel has Alloy coating of **55% aluminium**, **43.4% zinc** and **1.6% silicon by weight.** Since Aluminium is a lighter metal hence volumetrically it occupies approximately 80% of the volume, and hence aluminium helps to protect zinc coming in contact with atmospheric humidity and oxygen. Thus, Zincalume has double protection - **Barrier protection of Aluminium and Galvanic protection of Zinc**. Aluminium is protecting Zinc and Zinc is further protecting Base metal.

What are advantages of Rostfrei Make Zincalume Steel



Silos?

Zincalume Steel Silos provide following benefits that no other grain silo can provide so efficiently

- ★ · **Uniform Alloy Coating:** ZINCALUME Steel has Alloy coating of **55% aluminium**, **43.4% zinc** and **1.6% silicon** which is carried out at 600 Deg C, hence more uniform and strong.
- ★ · **Durability**: Zincalume steel has very good Corrosion Resistant Properties and can withstand Salt Spray Test of 2000 hours whereas GI 350 GSM can withstand a salt spray test of only 500 hours.
- ★ **Excellent Thermal Reflectivity**: Rostfrei Make Zincalume Steel Silos has Excellent Thermal Reflectivity of Solar Heat to reduce Heat Radiations inside. Hence Zincalume absorb only 4-5% heat as against GI Silos that absorb 22% to 26% heat, hence grains in Zincalume Silos are approximately 4 Deg Cooler than GI Silos
- ★ **Scratch Resistant:** Rostfrei Make ZINCALUME steel is coated with specially developed passivation and resin coating as separate layers that improves its scratch resistance qualities. Hence Zincalume looks newer for long maintaining its lustre
- ★ **Last Lasting Lustre:** Special treatment provided to Zincalume Steel reduces the rate of oxidation and resultant discoloration (Darkening) of Zincalume steels hence look newer for longer time. GI Steel silos become dull grey in color within 2 years of operation and start absorbing 26% of solar heat, which damages grains.
- ★ **Service Life:** ZINCALUME Silos provides up to 3 to 4 times the service life of Galvanised steel silos of same coating thickness. Average Life of Zincalume Silo is approximately 40-50 years as against 15 to 18 years of Galvanised steel silos having same coating thickness

Warranty: Only Rostfrei make ZINCALUME steel comes with up to 20 years warranty against perforation by weathering from the date of installation in neutral environment

Figure 2 - Maize Silo 5000 MT in Tamilnadu

How Rostfrei Make Zincalume Steel Silos are best for Grains like Paddy?

Rostfrei make Zincalume steels silos are not only good for Paddy but for all the grains. However in Paddy they give best performance than any other type of silo. There are many reasons for this and some of them are;

- ¡**Cooler Grains**: Since Zincalume Steel absorb only 4-5% heat as against GI Silos that absorb 22% to 26% heat, hence grains in Zincalume Silos are at least 4 Deg Cooler than GI Silos. Moreover it helps grains maintain its moisture levels and does not result weight loss due in moisture loss.
- ¡**Power Savings:** Cooler Grains requires lesser aeration and lesser infestation problems thus give more savings on power cost and fumigant cost
- ¡**Discoloration of Grains:** High solar heat absorption by grains increases average temperature inside silos, which results in browning, blackening or discoloration of grains.
- ¡**Lesser Brokens:** Moreover high solar heat absorption in GI Silos makes grains more brittle and which ultimately breaks during drying or milling of grains, resulting in more Brokens.
- ¡**High Moisture Storability:** Zincalume Steel is much better steel to store Grain with high moisture content as it is tested to withstand salt spray test of 2000 Hours as against 240 Hours of GI Steels of same coating thickness.

Why most other suppliers are not shifting to Zincalume Steel if it has so many advantages?

History of Grain Silos is very old. This concept started in 1907 and since then people are manufacturing grain silos. Since it started in colder places like US, Canada and Europe where humidity problems were less, GI Steel is the most obvious choice as it was cheap and performing fairly well in those climates. Hence they probably never felt a need to switch to relatively expansive materials like Zincalume, as 95% of their market is that areas only. However, people now understand the advantages of Zincalume Steel Silos and eventually shift to Zincalume Steel Silos in near future.

What is the USP of Rostfrei Make Zincalume Steel Silos?

In Rostfrei we don't treat Silo as a static storage tank, we treat it as a dynamic machine wherein live grains can be kept and their quality can be maintained. In short, we focus more on **Effective Grain Management** inside silo.

We stress more upon sizing **Aeration System** properly and balancing it by providing adequate **Roof Ventilation**. We provide **Temperature Monitoring System** that can withstand the grain pressure and accurate to the +/- 0.5 Deg C. This can be monitored remotely.

We size the **Fumigation System** in such a way that pressure drops are minimum and required numbers of air changes are effectively achieved with proper safety precautions as Phosphine gas is explosive when its concentration reach more than 17900 ppm.

Figure 3: 2000 MT Colorbond Paddy Silos in Amritsar