Abstract: The invention is related to the wall plate made up of galvanized plate protected by stainless steel plates at the silo exterior facade. The goal of the invention is to increase the stability of facade system with silo facade lining material in the silo facade systems, resistance against rusting and preventing the construction of a second silo facade, periodical maintenance and repairs by extending the life time of lining material accordingly. Invention also provides hygiene by preventing the contact of stored food products with galvanized plate. The existing invention in order to achieve this goal is consisting of stainless steel plates shaped in order to fit perfectly to the galvanized plate which are cut in different sizes. Steel plates which are used has 0.01-2 mm thickness, lowers the total cost when compared to other materials used in terms of cost.
DESCRIPTION

WALL PLATE IN SILO FACADE SYSTEMS

TECHNICAL AREA

The invention is about galvanized wall plate protected with stainless steel plate in silo facade and silo lining.

BACKGROUND OF INVENTION AND EXISTING APPLICATIONS

Protected storage of planted cereal products after the harvest is possible with silo systems. Metal facades of the exterior facade of silos as a barrier element became a preferred choice due to their condensation and prevention function against especially wind, rain and similar natural conditions.

As major construction element, silo facade systems are consist of profiles located to the holder girders via anchorage elements having different geometrical forms and profiles used in various numbers, facade lining materials including various numbers of screws needed for clamping to the holes formed on these profiles.

It is possible to locate an external element such as bolt to the bearer profile of the lining during covering the facade with lining material and dislocate if required after the clamping. Due to this reason, facade systems made up of metal are preferred in large silos and silos with wide surface size.

Surface of the silo facade lining materials are covered with zinc in order to extend the endurance period against the rust. This situation caused a decrease in the demand of zinc which has been witnessing a rapid reserve decrease and caused rapid increase in the cost rate.
Although same results have been achieved in the application of covering some metal materials with galvanize in an effort to reduce the costs, large facade systems like silos, rusts have been observed after 10-15 years of the application.

Rusting is not approved in the silo system which is used for storing cereal group and all facade system should be taken under maintenance due to this hazard for product and human health.

More weights are used in order to prevent rusting of silo facade lining in the current application, hence, the flexibility and endurance is lost in time due to the load implemented on this piece as a part of an application method while pressing the plate, wind load on the facade and vacuum effect of the wind.

Lose of position and flexibility in the mentioned pieces causes a movement gap on the bearer system of silo facade lining material, triggering rusting as the irregular vibration that occurs due to wind, rain and similar natural conditions, decreases resistance against exterior factors.

On the other hand, deformed facade lining also causes position lost and all the plates forming the system to have a different angle of reflection under the light. Consequently, the facade loses its visual aesthetics by displaying an irregular and unpleasant view.

Due to covering silo exterior lining with stainless steel, the economic life of the silo is increased. On the other hand, using stainless steel in the interior lining will prevent zinc accumulation in the food products.

**DESCRIPTION OF THE INVENTION**

By considering the existing technique, the goal of the invention is to increase the stability of facade system with silo facade lining material in the silo facade systems, resistance against rusting and preventing the construction of a second
silo facade, periodical maintenance and repairs by extending the life time of lining material accordingly.

The existing invention in order to achieve this goal is consisting of stainless steel plates shaped in order to fit perfectly to the galvanized plate which are cut in different sizes. Steel plates which are used has 0.01-2 mm thickness, lowers the total cost when compared to other materials used in terms of cost.

Differing number of bearer profiles determined according to the anchorage elements applied to the facade, is related with steel plate overlapping with the application of a silo facade lining material consisting of different numbers of plates that are clamping with these profiles and their characteristic is including various different numbers of steel plates in connection with providing an increase in the stability and resistance against rusting mentioned in the silo facade lining material made up of mentioned differing number of plates.

In order to structuring and fully understanding the advantages of existing invention with its additional elements, figures which are explained below should be evaluated.

Figure 1 shows the perspective view of ceiling plate, side wall plate and mounted shape of profile used in the silo facade system within the framework of invention.

Figure 2 shows perspective view of mounted situation of side wall plate used in the silo facade system within the framework of the invention.

Figure 3 shows perspective view of exploded situation of side wall plate used in the silo facade system within the framework of the invention.

Figure 4 shows perspective view of exploded situation of ceiling wall plate used in the silo facade system within the framework of the invention.

Figure 5 shows perspective view of mounted situation of ceiling wall plate used in the silo facade system within the framework of the invention.
Figure 6 shows the detailed view of side wall used in the silo facade system within the framework of the invention.

Figure 7 shows perspective view of exploded situation of stiffener used in the silo facade system within the framework of the invention.

Figure 8 shows perspective view of stiffener used in the silo facade system within the framework of the invention.

Reference numbers of pieces in the figures are listed below:

1. Silo
2. Stainless steel interior plate
3. Stainless steel exterior plate
4. Galvanized plate
5. Stiffener
6. Bulge
7. Ceiling sheet
8. Canal
9. Extension
10. Silo wall plate

Silo which is the subject of invention is a silo with special lining (1) is consisting of a stainless steel plate (2) which is basically in contact with food product and located in the interior surface, a stainless steel (aluminum or similar) exterior plate (3) and galvanized plate (4) between this plate.

Stainless steel (aluminum or similar) interior plates (2) and stainless steel exterior plate (3) are pieces which are the same or in similar sizes and same or female male compatible. In terms of cost, in the cases where the galvanized plate (4) carries out the function of carrying the load, the stainless steel (aluminum or similar) exterior plate (3) provides the insulation against the effects of exterior environment and food product inside the silo (1) will be protected by the stainless steel (aluminum or similar) interior plates (2).
In the application of the invention to the silo ceiling plate (10), the stainless steel steel (aluminum or similar) interior plates (2) and the stainless steel (aluminum or similar) exterior plate (3) will be preferably in corrugated rectangular shape and placed in the way that the long side will be in parallel with horizontal axis. The thickness of stainless steel (aluminum or similar) will vary between 0,01-2 mm and the thickness of galvanized plate (4) will be between 0,01-12 mm. The reason of thickness difference is due to function of galvanized plate (4) of carrying the load of the silo (1). Section of plates can be flat, swaged, corrogated or sinusoidal. In one of the application of the invention, sinusoidal structure forming canals and mounds parallel with surface, was preferred for meeting exterior forces.

The stainless steel (aluminum or similar) exterior plate (3) and the stainless steel (aluminum or similar) interior plates (2) are covered on the galvanized plate (4) on top, bottom and sides in order to protect the galvanized plate (4) from the exterior effects. Bulges (6) at the edge of each stainless steel (aluminum or similar) plates (2 or 3) and other stainless steel (aluminum or similar) plates (2 or 3) are connected.

Length of the bulges (6) are preferably equal to the thickness of galvanized plate's (4) exterior stainless, aluminum etc., lining and helping the protection of galvanized plate (4) by overlapping with other stainless steel (aluminum or similar) plate.

Protection of silo's (1) side walls by side wall plates (10) is not enough for long life. Besides, triangular ceiling plate (7) closing on each other at the top of the silo (1) and stiffener (5) should have a longer life with the same lamellar structure application.

Ceiling plate (7), the stainless steel (aluminum or similar) interior plates (2) and stainless steel (aluminum or similar) exterior plate (3) and coated galvanized plate are a whole whose Curves and coating points are compatible. Especially, bulges (6) and extensions of canal (8) allowing the connection of ceiling plate (7) with other ceiling plates (7) are wide and deep. "U" shaped canal (8) is located at one side of each ceiling plates (7) and on the other hand it has an extension that can fit
on the other canal (8). This will provide tightness needed for the protection of materials in the silo (1).

Load of ceiling plate (7) in the form of silo wall plate (10) and cereal pressure inside the silo (1) cannot be carried. Due to this reason, silo (1) is supported with stiffener (5) surrounding the silo. By using stiffener (5), the stainless steel steel (aluminum or similar) interior plates (2) and the stainless steel (aluminum or similar) exterior plate (3) as well as coated galvanized plate (4) like other all silo (1) components, it has a structure carrying the load due to galvanized plate (4) and protected with stainless steel (aluminum or similar) plates against the exterior effects.
CLAIMS

1. To be used in silos (1);

   - Approximately the same or similar sizes and same or female male compatible stainless steel (aluminum or similar) interior plate (2) and stainless steel exterior plate (3),

   - Providing insulation against the effects of exterior environment by stainless steel exterior plates (3), protecting the good products inside the silo by stainless steel (aluminum or similar) interior plate (2) and galvanized plate (4) with the function of carrying the load.

   Including;

   stainless steel exterior plate (3) where sinusoidal structure forming canals and mounds parallel with surface, is used for meeting exterior forces, stainless steel interior plate (2), galvanized plate (4), stiffener (5) and;

   stainless steel exterior plate (3) that closes on top, bottom and side of galvanized plate (4) for the protection of the galvanized plate (4) and a silo (1) which is characterized by silo wall plate (10) including stainless steel interior plates (2) and bulges (6).

2. To be used in silos (1);

   - Approximately the same or in similar sizes and same or female male compatible stainless steel (aluminum or similar) interior plate (2) and stainless steel exterior plate (3)

   - Providing insulation against the effects of exterior environment by stainless steel exterior plates (3), protecting the good products inside the silo by stainless steel (aluminum or similar) interior plate (2) and galvanized plate (4) with the function of carrying the load

   Including;
stainless steel exterior plate (3) where sinusoidal structure forming canals and mounds parallel with surface, is used for meeting exterior forces, stainless steel interior plate (2), galvanized plate (4), and;

A silo (1) characterized with a ceiling plate (7) having a "U" shaped canal (8) for the protection of the products inside the silo by provide tightness at one side and an extension (9) that can fit on the canal (8).