

5.2 Hot Dip Galvanized Steel in Agriculture

1. Requirements

Agriculture in Europe is a highly competitive business which therefore needs the best possible return from its assets. This means that all equipment, machinery, buildings and fittings must be cost effective in the short term and still provide long term benefits such as durability and low maintenance costs.

Low maintenance costs are expected of the machines and equipment in spite of the fact that they will have to run each day in hard, tough, dirty conditions. (Fig. 1)

2. Conditions of use

Many agricultural fittings and equipment items are made of steel. Examples include fences, gates, stalls, greenhouses, structural steelwork, containers and general equipment. However, steel must be protected from corrosion and hot dip galvanizing is one of the simplest and most durable methods available. The galvanizing process itself has been described in Data Sheet 1.2.

Clean country air, free of industrial pollution, is not a corrosion hazard but there is a number of other solid, liquid and gaseous media with highly corrosive properties. For instance, stall fittings are subject to a high degree of corrosion due to animal waste, urine and other pollution. In stables the temperatures are higher as is the moisture level and there are increased levels of ammonia too. All this combines to make an extremely corrosive environment. Other situations can also be corrosive. Equipment and fittings are subject to dirt and deposits as well as moisture which can increase corrosion especially in inaccessible places. These conditions are extremely demanding upon the corrosion protection system. It must protect but at the same time be non toxic, absorb knocks, be hard wearing, last a long time and be competitively priced. Hot dip galvanizing has the advantage that it meets all these criteria.

3. Agricultural buildings

Traditional brick built buildings look very nice when viewing a farm but they are usually old and totally unsuited to today's technology and equipment. Modern buildings made of steel have greater spans which allow better use of the space provided.

Steel is especially suitable for silos as its strength to weight ratio is high compared with its cost. Hot dip galvanizing will protect the steel plate as well as the support steel for many years.

Grain can be safely stored in galvanized silos since its water content must be below 14% before storing. Both cylindrical and rectangular silos have been found to be satisfactory. Steel silos are also being used to store stationary liquid manure as tighter legislation has affected its dispersal. Hot dip galvanizing can be used to protect the steel in these silos as well

but should be combined with an additional organic coating (Fig. 3).

4. Fittings for livestock buildings

Depending upon the type of animal being housed, or the purpose of the building, there is a wide range of galvanized fittings available. These include partitions, gratings, tie rings, hay racks and feed troughs. All of them are subject to corrosive environments but good ventilation and cleanliness will prevent excessive corrosion of the zinc.

The galvanized coating will be rubbed by either the chafing of the animals or from friction of its tether (Fig. 4). But the hard alloy layers in the coating will resist this kind of abrasion better than any other protective coating.

The zinc coating is in greater danger in the area near the floor due to the dung, urine and moisture which accumulates there. It is not the

Fig. 1: Hay and straw conveyor.

Fig. 2: Agricultural machines and buildings using galvanized steel.



Fig. 1



Fig. 2