Recyclean Systems AB

Biotechnology for surface treatment

Recyclean FRE

System for Flux Regeneration for Hot Dip Galvanizing

FRE Makes Production Chemicals from Waste

Conventional “dry processes” for hot dip galvanizing always lead to iron deposits in the flux bath.

The material is transferred from the pickling to the flux process with the pickling acid. The iron transferred reacts with the zinc in the zinc chamber and forms dross. Each part of iron bonds up to 25 parts of zinc. This means unwelcome costs as this “slag product” causes higher zinc consumption.

Recyclean FRE is a well-tested system for flux regeneration which keeps the flux bath constantly free from iron. At the same time, the flux bath is maintained automatically with flux salts. The system works on the principle that iron is precipitated while the chloride ions - transferred from the pickling bath - cause a reaction with the added ammonium hydrate. This leads to the formation of ammonium chloride. The used burn-off bath constitutes a raw material source for zinc chloride for the flux bath. The precipitated iron is separated in a special separator and filtered via a filter press. The technique is well tested and many reference systems are in use in Europe.

- Produces flux agent from waste
- Gives a constant low iron content and hence low dross formation
- Few moving parts, simple maintenance, corrosion-resistant
- Rational and profitable environmental technology

The flux bath is passed to a re ctor which is the heart of the FRE system. The flux bath is kept free from iron constantly and automatically. The technique means lower zinc costs.

Process Description

The flux bath is pumped to a separator/reactor (Recyclean FRE) which consists of a slowly rotating blade system.

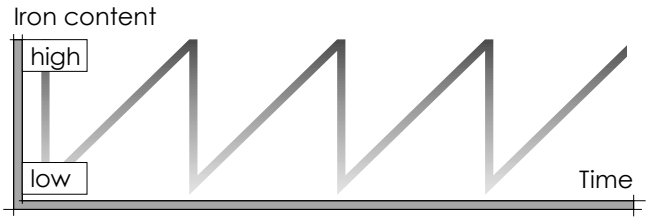
In the separator the pH value is measured and ammonium hydrate added until the pH value reaches 4.8. By stirring and adding hydrogen peroxide, the iron is oxidized from divalent to trivalent iron which is precipitated as iron oxide/hydroxide. The precipitated iron is extracted in the reactor which has an excellent separation capacity. The iron sludge is removed from the settling tank via a sludge pump and pumped into a filter press where it is deposited as sludge cake with a dry content of approx. 30%.

The clear phase from the filter press is returned to the flux bath via a pump tank.

By pumping the zinc stripping bath to an intermediate tank from which zinc chloride/ hydrochloric acid solutions can be added, zinc chloride is added to the flux bath. There it forms the basis for the flux salt together with ammonium chloride, which is formed when the chlori- des transferred from the pickling bath react with the added ammonium hydrate.

The supply includes:

- Reactor
- Container for burn-off bath
- pH adjustment system
- Metering pumps for ammonium and hydrogen peroxide
- Sludge pump and filter press
- Automatic control unit
  (also available with computerised remote monitoring)



Traditional dumping with stepped regeneration:
Varying iron content depending on dumping frequency

The Recyclean method:
Constant iron content under 1 g/l < 1 gFe/l.

The Recyclean FRE system for flux generation is an important element in the total Recyclean system for hot dip galvanizig.

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Technical Data

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Dimensions

The flow over the regeneration equipment is selected so that a balance is achieved in the flux bath.

This balance is affected by the structure of the pickling process, the quantity and structure of material. Naturally we will help you select suitable dimensions.

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