

KYAMBOGO UNIVERSITY

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INDUSTRIAL TRAINING REPORT FOR THE MONTH OF JUNE

## GALVANISING LINE PROCESS

### 1. Pay off section

The pay off equipment is comprised of pay off trays and pay off frames which can be changed freely for the coil to be paid off smoothly without tangles and snags.



### 2. Annealing section

This bath is made of stainless steel, gas fired. Annealing is a process by which the properties of steel are enhanced to meet machinability requirements.

This is done in a fluid bed furnace.

Annealing is a process of heating the steel slightly above the critical temperature of steel between 700 and 800 degrees centigrade and allowing it to cool slowly.

### 3. Water quench bath

It's under this section that wire is rapidly cooled from above (800 to about 60) degrees centigrade. Cool water is pumped in by the help of centrifugal pumps from the cooling tower. The level of water in the tank is regulated by the help of solenoid valves.

### 4. Pickling section

A pickling line is a state of art of high speed wire cleaning package constructed of composite materials and using advanced fluid flow technology. It is made of acid tanks with different concentrations varying in each tank. Pickling is important so as to remove the rust that develops around the steel.

The acid flows into the tanks by force gravity and the concentrations are checked regularly.

#### 5. Hot dip wire galvanising

Zinc bath is comprised of a body, gas fired immersion heaters a temperature and electric control system. Thermocouples are employed to test temperature and allow control.

The zinc bath is kept at a temperature of 450 degrees Celsius and on top is a layer of vermiculite and glass wool to help in the insulation as well as the safe guard to the operators from too much heat.

#### 6. Wiping system

Pads above and below the wire are to wipe off excess zinc as the wire exits the molten zinc.

The wires pass longitudinally between a set of two pads that are rectangular in shape, the wires exit the back side of the pads directly into the individual quench tubes that cool the wires to ambient temperature.

#### 7. Secondary quenching

The steel wire must be cooled quickly after being wiped; this is a key process in controlling consistency of the coating weight and improving the firmness and smoothness of coating surface. Cooling water is recycled to reduce consumption.

#### 8. Wax tank

The tank consists of a chemical called pan chem. That prevents oxidation of zinc thus lengthening the time for zinc coating to become part of steel.

To meet the intended quality, the wax has to be kept at a set temperature around 60 degrees Celsius that is provided by the electrical heater attached to the wax tank.

#### 9. Take up

Vertical, pattern laid take up units are specified. The speed of each steel wire can be independently controlled. Each take up has a variable frequency motor for speed adjustment. The wire runs free of vibration. Different diameters of wire can be galvanised at the same time.

The speed of coiling capstan and the turn table is proportioned by use of the PLC.



### Quality control tests.

A number of tests are done in the laboratory on different samples of steel wire that is to say the following are determined

- Tensile strength
- Zinc coating weight
- Different concentrations of acid by titration
  - Flux and wax concentration

## CONCLUSION

The four weeks training so far i have had in roofing rolling mills has been great for the reason that i have been able to attain an avalanche of skills for a short while from a number of engineers, technicians and managers of the plant who are willing to teach.