

## Instruction for steam boilers preservation during shut down period with FINEAMIN<sup>®</sup>

### **VERY IMPORTANT!**

**These instructions are valid only when the plants have been treated with FINEAMIN<sup>®</sup> during minimum 3 to 6 months before shut down.**

In all the cases of preservation of boilers *in wet conditions*, it is highly recommended to recirculate the boiler water with the pump ensuring a minimal flow in all the parts of the boiler (particularly in all the tubes). **The circulation pump must be in service for 2 - 3 hours per day.** The fact to re-circulate the boiler water through the de-aerators will allow to keep the boilers warm, but in the same time it makes an over dosage of FINEAMIN in the boiler water impossible.

## For short periods of time:

### 1. Shut down period from 3 to 6 days

**Boiler can be stopped without particular measures.** When the shut down period is frequently repeated, we advice to keep the boiler under pressure.

### 2. For short shut down periods, up to 2 weeks

#### 2.1. Dry conservation

**Empty the boiler when hot** and the FINEAMIN protective film will be efficient to avoid corrosion due to condensation.

#### 2.2. Conservation of boilers kept under pressure and completely full

Two days before shut down, increase the dosage rate in order to **reach 20 ppm polyamine excess** and **minimum pH of 9.5** in the boiler water.

Fill the boiler completely.

#### 2.3. Conservation of boilers kept warm (with water circulation through the de-aerators)

The boilers should have the normal operation water level in the drum and keep a temperature of around 120° C. The addition of **FINEAMIN 35 ( contains DEHA)** in the boiler drum, in order to have an excess of DEHA of 2 ppm, will contribute to avoid any kind of corrosion.

## For long periods of time (more than 2 weeks):

### 3. Conservation in cold conditions, with the water level at the top of the boiler drum

#### **Two days before shut down:**

Increase the dosage rate in order to reach 20 ppm polyamine excess and minimum pH of 9.5 to 10.5 in the boiler water of water tubes boilers.

#### **After shut down:**

Fill completely the boiler drum and add 0.5 liter per m<sup>3</sup> of water contain of **FINEAMIN 35 (contains DEHA)**.

#### **During preservation:**

Every two weeks, the pH and polyamine excess have to be measured and if necessary corrected. The minimal pH is 9.5 and the polyamine excess has to be kept higher than 5ppm.

#### **When restarting the plant:**

The water level in the drum must be decreased to the normal level and an efficient and frequent blow down of the boilers must be done.

### 4. Conservation in cold conditions and with the water level at the normal level (ready to go)

#### **2 days before shut down:**

Increase the dosage rate in order to reach 20 ppm polyamine excess and minimum pH of 9.5 to 10.5 in the boiler water of water tubes boilers.

#### **After shut down:**

After shut down, add 0.5 liter per m<sup>3</sup> of water contain of **FINEAMIN 35 contains (DEHA)**. **We highly recommend using nitrogen protection to fill the steam part of the boilers.**

#### **During preservation:**

Every 2 weeks the pH and polyamine excess have to be measured and if necessary corrected. The minimal pH is 9.5 and the polyamine excess has to be kept higher than 5ppm.

#### **When restarting the plant:**

When the plant is restarted, an efficient and frequent blow down of the boilers must be done.

## For long periods of time (more than 6 months):

In this case we highly recommend keeping the boilers empty. That means to empty the boiler when still cold (just after shut down) and to permit an air circulation in the boiler.

If wet conservation is necessary, it is recommended to keep the boiler completely full, warm or with internal water circulation.

### **IMPORTANT!**

**When the boiler is started again, no particular measure has to be taken. Only increase blowdown during the first day until the normal analyses results are reached.**