

Application of ELCE

Date: October 1998

| | |
|--------------------------------|--------------------------------------|
| Installation location | Cleaners (laundry shop) |
| Category | Elimination of scale inside a boiler |
| Source of water | City water |
| Type of ELCE | S-2 |
| Date of installation | April 1997 |
| Purpose of installation | Reduction of cost and maintenance |



<Purpose>

Boiler is used either by heating water or as steam after warming up water, but due to the fact that we replenish the same amount of water as we used as steam or hot water, the hot water inside gradually becomes dense water with content materials. Therefore, the amount of calcium, magnesium, silica, iron gets bigger which causes the outbreak of rust on the surface of inside the boiler and then scales stuck. Furthermore, percentage of heat-efficiency gets worse and accelerate the corrosion on the surface of inside the boiler. In order to get rid of this problem, we conducted experiment by installing our equipment ELCE.

<Traditional method>

In order to prevent these problems, people usually install water—softener (prevention of calcium by exchanging ion) to prevent calcium from inside the water, and put into cleanness fluid to prevent magnesium, silica and other materials. However, this method has a limitation, and it can not eliminate all the scales completely. Furthermore, water—softener and cleanness fluid can not prevent rusting, most of the boilers run down its lifetime (shorten its life) due to the duplicative suffer from rust and scale.

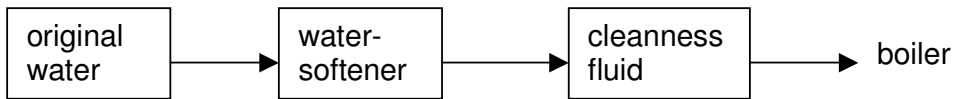
<Water activator (ELCE)>

ELCE is not an equipment which eliminate materials (magnesium, silica, calcium) such as water—softener. Instead of eliminating these materials, ELCE has a function to stabilize these materials and has a power of anti—oxidation, therefore, ELCE never accelerate scaling and rusting. In addition to this function, ELCE will eliminate the existing formation of deposits, such as rust and scale.

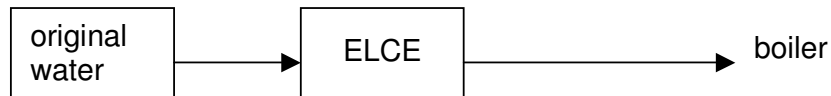


<Running cost>

1. Traditional system flow



2. Water activator (ELCE) flow



3. The size and operating period of time

1'000 ℓ / h volume of evaporation, Boiler operating 8 hours a day

| | | |
|-------------------------------|--------------|---------------------------|
| 4. Traditional necessary cost | Total | 1'543'600 yen / month |
| @ cleanness fluid | | 80'000 yen / 20 ℓ / month |
| @ water-softener | rock salt | 4'000 yen / 25 kg / month |
| | running cost | 40'000 yen / month |
| @ fuel expense | | 1'419'600 yen / month |

1'000 ℓ / volume of evaporation

$$1'000 \ell \times 600\text{kcal} = 600'000 \text{ kcal}$$

percentage of combustion 70%

$$600'000 \times 1.3 = 780'000 \text{ kcal}$$

a fuel calorie 10'000 kcal / 65 yen / ℓ

$$780'000 \div 10'000 = 78 \ell / \text{h}$$

decrease of heat-efficiency by scale 40%

$$78 \times 1.4 = 109.2 \ell / \text{h}$$

$$109.2 \ell \times 65 \text{ yen} \times 8\text{h} = 56'784 \text{ yen / day}$$

$$56'784 \text{ yen/day} \times 25 \text{ days} = 1,419,600 \text{ yen / month}$$

5. By installing ELCE, scale was removed and then

$109.2 \ell - 78(= 31.2e/h$ shall be the reduction of energy

$31.2 \ell \times 65 \text{ yen} \times 8h = 16'224 \text{ yen / day}$

$16'224 \text{ yen / day} \times 25 \text{ days} = 202'800 \text{ yen / month}$

<The operating cost of usual system>

| | Item | Quantity / month | Expenses / month |
|-----------------|-------------|------------------|----------------------|
| Water softener | Rock salt | 25 kg | 4'000 yen |
| Running cost | | | 40'000 yen |
| Cleanness fluid | Chemical | 20 ℓ | 80'000 yen |
| Fuel | A heavy oil | 24'840 ℓ | 1'419'600 yen |
| Total | | | 1'543'600 yen |

<Remarks>

Actually working days: 25 / month

Fuel: 65 yen / ℓ

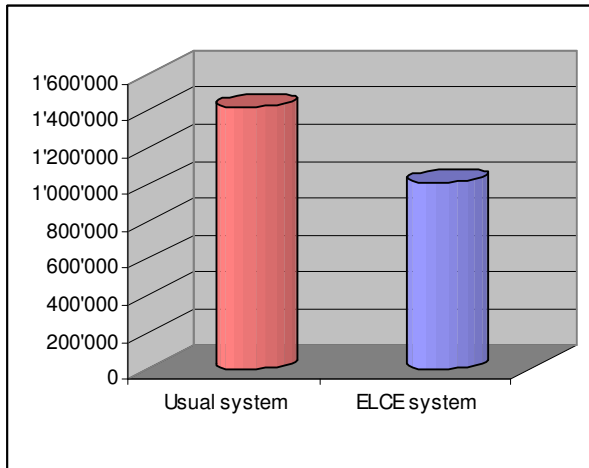
Decrease of heat-efficiency by scale: 40%

<The operating cost of ELCE system>

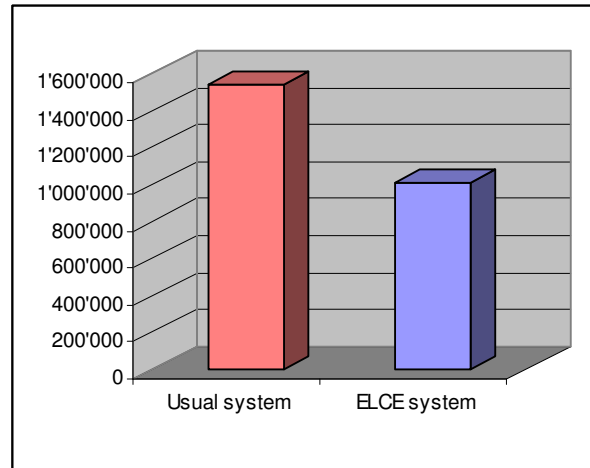
Fuel A heavy oil 15'600 ℓ 1'014'000 yen

<Remarks>

After 3 months installed ELCE, the scale was removed



Deference of fuel expense



Deference of total expense

<Result>

1'543'600 yen / month Before!

1'300'000 yen / month After installation of ELCE!

Cost down is 240'000 yen / month

- Plus:
1. Boiler has been operating without no trouble for 8 months.
 2. A person in charge of the boiler checked inside the boiler after 6 months of ELCE installation with a microscope, he was surprised because no scale had been seen.
 3. Buying price of ELCE equipment, installing construction cost could have been collected.

Additional merit!

By installing ELCE, we could reduce the expense for detergent by 30%.