

# PIPETECTOR Scientific Report

Anti-Corrosion Application, Sumitomo Light Metal Industries Ltd.

Japan System Planning Co., Ltd.

## \* Installation Purpose and Result

The manufacturing plant of Sumitomo Light Metal Industries Ltd in Japan was built more 30 years ago, and the galvanized iron pipe is used for this factory. This manufacturing plant had been suffering from a major problem of corrosion in the hot water pipework and discolored water was coming from the faucets.

For the protection of hot water pipework from corrosion, one unit of Pipetector was installed on the make-up water pipe connected to one of the boilers. Before the installation of NMR unit, the sample water was taken from the hot water faucet for the analysis of Fe content, which was found to be 3.3mg/l, the discolored was 100 degrees, and turbidity was 10 degrees. Pipetector was installed on July 8 of 2002, and 2 months after the installation, Fe content went down to 1.1mg/l, the discolored was 25 degrees, and the turbidity was 4 degrees.

4 months after the installation, Fe content continued to decrease to 0.52mg/l, the discolored decreased to 7 degrees, and the turbidity was less than 0.5 degrees. It means that the corrosion (FeO(OH)) inside of the pipework has been terminated in 4 months after the installation, and reduced to magnetite (Fe<sub>3</sub>O<sub>4</sub>) which is not dissolved into the water.

11 months after the installation, for the line with Pipetector, the corrosion (red color) reduced to magnetite (black color) was recognized by the change of color and decreased volume while the line without NMR has still big volume of corrosion, and it proved that the rebirth of the pipe was done by the effect of Pipetector.

### \*11 months after the installation of Pipetector



Without Pipetector

With Pipetector

## \* Installation Summary

|  |   |
|--|---|
| Name of Building                                     | Sumitomo Light Metal Industries Ltd. in Japan       |
| Building Summary                                     | Manufacturing plant, more than 30 years old.        |
| Installation Place                                   | Make-up water pipe connected to one of the boilers. |
| Installation Day                                     | July 8, 2002  |
| Installation Place<br>Number of installed PIPETECTOR | Make-up water pipe of a boiler<br>PT-50DS×1unit     |

## \*Fe content in hot water (mg/l)

| Items of Water Analysis | Before Installation<br>Jul. 8, 2002 | 2 Months After Installation<br>Sep. 12, 2002 | 4 Months After Installation<br>Nov. 22, 2002 | Japanese Government Standard for Drinking Water |
|-------------------------|-------------------------------------|--|--|---|
| Fe content (mg/l)       | 3.3mg/l                             | 1.1mg/l                                      | 0.52mg/l                                     | 0.3mg/l   |
| Discolored (degrees)    | 100 degrees                         | 25 degrees                                   | 7 degrees                                    | Less than 5 degrees                             |
| Turbidity (degrees)     | 10 degrees                          | 4 degrees                                    | 0.5 degrees                                  | Less than 2 degrees                             |

(Analyzed by The Aichi Pharmaceutical Association)

## Before Installation

### Water Analysis Report

July 18, 2002

The Aichi Pharmaceutical Association  
President Katsuhiko Hattori

|                            |                        |
|----------------------------|------------------------|
| Kind of Sample             | Running Water (Boiler) |
| Place to Take Sample Water |                        |
| Date to Take Sample Water  | <b>July 8, 2002</b>    |

| Item for Analysis | Result      |
|-------------------|-------------|
| Discolored        | 100 degrees |
| Turbidity         | 10 degrees  |
| Fe Content        | 3.3mg/l     |

## 2 Months After Installation

### Water Analysis Report

September 17, 2002

The Aichi Pharmaceutical Association  
President Katsuhiko Hattori

|                            |                                  |
|----------------------------|----------------------------------|
| Kind of Sample             | Running Water                    |
| Place to Take Sample Water | Faucet in bath room(boiler line) |
| Date to Take Sample Water  | <b>September 12, 2002</b>        |

| Item for Analysis | Result     |
|-------------------|------------|
| Discolored        | 25 degrees |
| Turbidity         | 4 degrees  |
| Fe Content        | 1.1mg/l    |

## 4 Months After Installation

### Water Analysis Report

December 3, 2002

The Aichi Pharmaceutical Association  
President Katsuhiko Hattori

|                            |                          |
|----------------------------|--------------------------|
| Kind of Sample             | Running Water            |
| Place to Take Sample Water |                          |
| Date to Take Sample Water  | <b>November 22, 2002</b> |

| Item for Analysis | Result                |
|-------------------|-----------------------|
| Discolored        | 7 degrees             |
| Turbidity         | Less than 0.5 degrees |
| Fe Content        | 0.52mg/l              |

# 設置前

## 水質検査結果書

第 1  
平成 14 年 7 月 18 日

建築物飲料水水質検査受知事登録  
計量証明事業受知事登録 第276号  
社団法人 愛知県薬剤師会  
会長 服部 勝彦

様

生活科学センター  
〒 456-0034  
名古屋市熱田区伝馬二丁目19番18号  
TEL (052)683-1131

|       |                          |    |          |      |      |  |
|-------|--------------------------|----|----------|------|------|--|
| 試料の種類 | 水道水 (ボイラー)               | 持込 | (7月9日受入) |      |      |  |
| 採取場所  |                          |    |          |      |      |  |
| 採取日時  | 平成 14 年 7 月 8 日 7 時 30 分 | 天候 | 曇        | 採取者名 |      |  |
| 気温    | **** °C                  | 水温 | **** °C  | 残留塩素 | **** |  |

(注) 収集および持込試料の場合は依頼者のお申出により記入しました。  
上記試料に対する検査結果はつぎのとおりです。

| 試験項目 | 結果      | 試験項目 | 結果 |
|------|---------|------|----|
| 色度   | 100度    | 以下余白 |    |
| 濁度   | 10度     |      |    |
| 鉄    | 3.3mg/l |      |    |
| 以下余白 |         |      |    |
| 備考   |         |      |    |

# 設置 2 ヶ月後

## 水質検査結果書

第 1  
平成 14 年 9 月 17 日

建築物飲料水水質検査受知事登録  
計量証明事業受知事登録 第276号  
社団法人 愛知県薬剤師会  
会長 服部 勝彦

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TEL (052)683-1131

|       |                            |    |           |      |      |  |
|-------|----------------------------|----|-----------|------|------|--|
| 試料の種類 | 水道水                        | 持込 | (9月12日受入) |      |      |  |
| 採取場所  | 風呂供給用蛇口 (ボイラー系統)           |    |           |      |      |  |
| 採取日時  | 平成 14 年 9 月 12 日 11 時 10 分 | 天候 | 晴         | 採取者名 |      |  |
| 気温    | **** °C                    | 水温 | **** °C   | 残留塩素 | **** |  |

(注) 収集および持込試料の場合は依頼者のお申出により記入しました。  
上記試料に対する検査結果はつぎのとおりです。

| 試験項目 | 結果      | 試験項目 | 結果 |
|------|---------|------|----|
| 色度   | 25度     | 以下余白 |    |
| 濁度   | 4度      |      |    |
| 鉄    | 1.1mg/l |      |    |
| 以下余白 |         |      |    |
| 備考   |         |      |    |

# 設置 4 ヶ月後

## 水質検査結果書

第 1  
平成 14 年 12 月 3 日

建築物飲料水水質検査受知事登録  
計量証明事業受知事登録 第276号  
社団法人 愛知県薬剤師会  
会長 服部 勝彦

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TEL (052)683-1131

|       |                           |    |            |      |       |  |
|-------|---------------------------|----|------------|------|-------|--|
| 試料の種類 | 水道水                       | 持込 | (11月22日受入) |      |       |  |
| 採取場所  |                           |    |            |      |       |  |
| 採取日時  | 平成 14 年 11 月 22 日 **時 **分 | 天候 | *****      | 採取者名 | ***** |  |
| 気温    | **** °C                   | 水温 | **** °C    | 残留塩素 | ****  |  |

(注) 収集および持込試料の場合は依頼者のお申出により記入しました。  
上記試料に対する検査結果はつぎのとおりです。

| 試験項目 | 結果       | 試験項目 | 結果 |
|------|----------|------|----|
| 色度   | 7度       | 以下余白 |    |
| 濁度   | 0.5度未満   |      |    |
| 鉄    | 0.52mg/l |      |    |
| 以下余白 |          |      |    |
| 備考   |          |      |    |