

PIPETECTOR Scientific Report (No.3)
**Anti-Corrosion Application, School
Seijoh University Library**

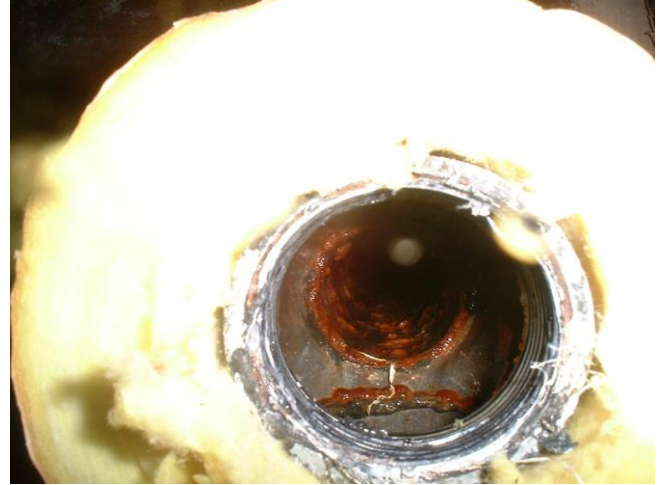
NMR Corporation

Without PIPETECTOR



(Pipe cut on January 13 in 1999)

With PIPETECTOR



(Pipe cut on August 8 in 2000)

◆Building Summary

9 years after the library was built, some of the old pipes were replaced with new pipes. However, it is very difficult to change large size main steel galvanized pipes to new pipes because they are existed inside the building.

4 years later, anti-corrosive chemicals had been used for preventing corrosion, however, there were still water leaks in many pipes.

So PIPETECTOR was installed because its cost is inexpensive to stop corrosion in the air conditioner's steel galvanized pipes.

◆Installation Results

12 months after the installation of PIPETECTOR, Fe ion content in water of the hot and chilled water in the storage tank decreased to 0.80mg/l from 1mg or more.

16 months after the installation, mass ratio of magnetite analyzed by Tokyo University of Science increased to 55.4%, while magnetite naturally forms under 10% in steel galvanized pipe (SGP), and it means large amount of corrosion has already been reduced to magnetite.

Moreover, **39 months after the installation** of PIPETECTOR, mass ratio of magnetite increased to 74.2%. It means mass ratio of magnetite increased by 33.9 % in **23 months after the installation**. It is confirmed that PIPETECTOR stops corrosion, reduces corrosion to magnetite, decreases blockage by shrunken its volume, protects inside of the pipes by insoluble magnetite, and keeps the strength of the pipes.

◆Installation Summary

| | |
|---|--|
| Name of Building | Seijoh University library, Tokyo |
| Building Summary | Reinforced 5-story building, 10years after being built |
| Installation Day | April 1, 2000 |
| Installation Place Number of installed PIPETECTOR | On outlet of main circulating hot and chilled pipes (SGP 150mm) PT-150DS×1unit |

◆Results of Mass Ratio of Magnetite

| | 16 months after the installation August 8, 2000 | 39 months after the installation July 18, 2002 | Increased ratio [Compared to 16 months after the installation] |
|-----------------------------------|--|---|--|
| Mass ratio of magnetite (%) | 55.4% | 74.2% | 33.9% |

16 months after the installation

Mass Analysis Test Result

No.2000-7
August 9, 2000

Tokyo University of Science

The following is the Mass Analysis Test Result based on material given out on August 7 in 2000

| | | | |
|--------------------|--|-------------|------------|
| Name of Material | BF3 circulated air conditioning pipes (Sample material was taken out on August 7 in 2000) | | |
| Installation Place | Seijoh University Library, Tokyo | | |
| Date of Analysis | August 8, 2000 | Client Name | University |

Mass Analysis Test Result

Item

Magnetite: 55.4%

39 months after the installation

Mass Analysis Test Result

No.02-7
July 19, 2002

Tokyo University of Science

The following is the Mass Analysis Test Result based on material given out on July 16 in 2002

| | | | |
|--------------------|--|-------------|------------|
| Name of Material | BF3 circulated air conditioning pipes (Sample material was taken out on July 7 in 2002) | | |
| Installation Place | Seijoh University Library, Tokyo | | |
| Date of Analysis | July 18, 2002 | Client Name | University |

Mass Analysis Test Result

Item

Magnetite: 74.2%

16 months after the installation

平成 12 年 8 月 9 日

質量分析試験検査成績書

日本システム企画株式会社 殿

平成 12 年 8 月 7 日試験依頼により提出された試験品について行った質量分析試験検査結果は下記の通りです。

記

| | | | |
|---------------|---|------------|----|
| 試験品の名称 | BF3 循環空調配管 (NMR パイプテクター設置管) 内錆スケール (平成 12 年 8 月 7 日 採取試験品) | | |
| 検査配管設置場所 | 東京都 図書館 | | |
| 検査日 | 平成 12 年 8 月 8 日 | 検査依頼者 | 大学 |
| 質量分析試験検査の成績 | | | |
| 項 目 | | 測定値 (重量 %) | |
| マグネタイト (黒錆) : | | 55.4 | |
| 以上 | | | |

39 months after the installation

平成 14 年 7 月 19 日

質量分析試験検査成績書

殿

平成 14 年 7 月 16 日試験依頼により提出された試験品について行った質量分析試験検査結果は下記の通りです。

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| 検査日 | 平成 14 年 7 月 18 日 | 検査依頼者 | 大学 |
| 質量分析試験検査の成績 | | | |
| 項 目 | | 測定値 (重量 %) | |
| マグネタイト(黒錆量) | | 74.2 | |
| 以上 | | | |