

NMR PIPETECTOR Installation Report, in UK

Anti-Corrosion Application, Hilton Hotel in Portsmouth, UK

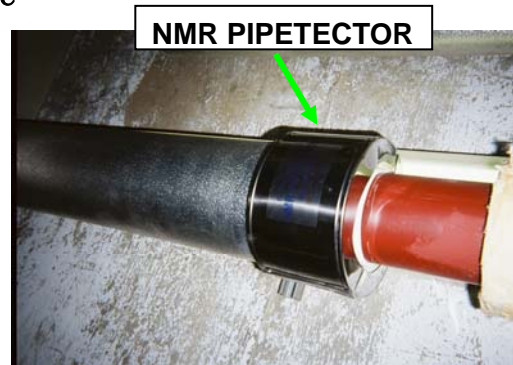
(Central Heating System)

NMR Corporation

*Appearance of Building and Installation Place



Appearance of the building



Header pipe of the central heating

< Installation Purpose and Result >

The Hilton Hotel in Portsmouth is situated on the South Coast of England and belongs to one of the most prestigious hotel chains in the world having 120 bedrooms and was built in 1981. The hotel pipe work is also 25 years old, and the hotel had a major problem with the central heating pipes that were becoming partially blocked by corrosion build up which was affecting the efficiency of the heating system, which required flushing out to enable maintenance work to be undertaken, however, the maintenance manager was very concerned that flushing out process could cause major problems with the pipes leaking as a result of various chemicals being used.

For the protection of the central heating pipe work from corrosion, one NMR unit of 6 inch (PT-150DS) was installed onto 145mm outer diameter header pipe of the central heating iron pipe work. 21 weeks after the installation of NMR Pipetector onto the **central heating pipe work**, the Fe content in water considerably decreased from **37.55mg/l** (before the installation of NMR Pipetector) to **0.292mg/l**, and the color of water drastically decreased from **150 mg/l Pt/Co** (before the installation) to **4 mg/l Pt/Co**. 22 weeks after the installation, the Fe content decreased to **0.276mg/l** and the color decreased to **0.7 mg/l Pt/Co**.

The decrease of Fe content and discoloration means that the existing corrosion is now being changed into magnetite (Fe_3O_4) which is not dissolved into the water and new forming of corrosion ($FeO(OH)$) inside of the pipe work was terminated, and protects the inside of the pipe from corrosion.

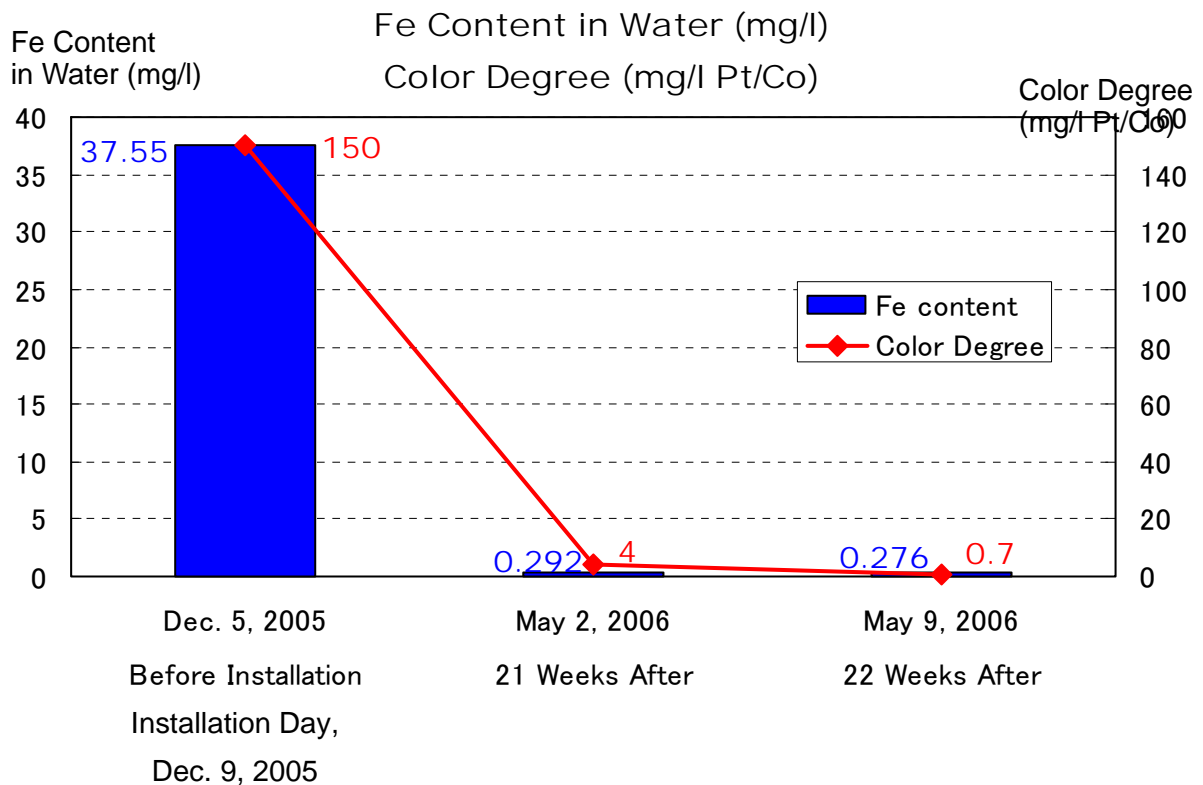
A moderate number of free bacterial cells, and flagellated protozoa as well as ciliated protozoa found in the sample taken just after the installation, were all killed and did not found their presence in the sample water taken 33 days after the installation of NMR Pipetector because of the reduction of corrosion to magnetite and no new forming of corrosion which supports the biological organisms to live.

< Installation Summary >

Name of Building :Address	Hilton Portsmouth Hotel Eastern Road Farlington, Portsmouth PO6 1UN, United Kingdom
Building Summary	One of the prestigious hotels in the world. The hotel was built in 1981 and has 120 rooms.
Installation Place	Header pipe of central heating system pipe work.
Installation Day	December 9 th in 2005
Number of installed NMR PIPECTOR	6 inch header pipe of central heating pipe work (Iron pipe) PT-150DSx1unit

<Fe content in central heating water (mg/l)>

Fe Content	Color	Date
37.55 mg/l	150 mg/l Pt/Co	Before Installation, December 5, 2005
Installation Day, Dec. 9, 2005		
0.292 mg/l	4 mg/l Pt/Co	21 Weeks After Installation, May 2, 2006
0.276 mg/l	0.7 mg/l Pt/Co	22 Weeks After Installation, May 9, 2006



**Before Installation
(Fe content)
(Color)**

Certificate of Analysis



1314
0897
1229
1510



STL

Sample **2** Laboratory Number : **186987**
of **3** Report Number : **BR/315688/2005** Issue **1**

Sample Source : **Cambridge Water Company**
Sample Point Description : **Cambridgeshire Water Company**
Sample Description : **Hilton Hotel C/H**

Sample Date : **05 December 2005** Sample Received : **05 December 2005** Analysis Complete : **13 December 2005**

Test Description	Result	Units	Limit	Accreditation	Method
Iron, Total as Fe	37550	ug/l	200	B	SBC44
Biological Examination	Analyst Comment	-	0	B	
Colour	>150.0	mg/l Pt/Co	20	B	SBE17/SBE5

Analyst Comment for 186987 : see report for biological analysis - JCP

Accreditation Codes : * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted
For Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered. I/S = Insufficient sample




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**21 Weeks After Installation
(Fe content)**

Certificate of Analysis

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Sample **2** Laboratory Number : **378185**
of **3** Report Number : **BR/343007/2006** Issue **1**




Sample Source : **Cambridge Water Company**
Sample Point Description : **Cambridgeshire Water Company**
Sample Description : **HILTON HOTEL PORTSMOUTH CENTRAL HEATING SYSTEM**
Sample Date : **03 May 2006** Sample Received : **03 May 2006** Analysis Complete : **05 May 2006**

Test Description	Result	Units	Limit	Accreditation	Method
Iron, Total as Fe	292	ug/l	200	B	SBC44

Accreditation Codes: * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted
For Microbiological determinands O or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered. I/S = Insufficient sample

**22 Weeks After Installation
(Fe content)**

Certificate of Analysis

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0897
1229
1510

Sample **1** Laboratory Number : **386983**
of **3** Report Number : **BR/344300/2006** Issue **1**

Sample Source : **Cambridge Water Company**
Sample Point Description : **Cambridgeshire Water Company**
Sample Description : **HILTON, DOMESTIC WATER CENTRAL HEATING, PORTSMOUTH.**
Sample Date : **09 May 2006** Sample Received : **09 May 2006** Analysis Complete : **12 May 2006**


Test Description	Result	Units	Limit	Accreditation	Method
Iron, Total as Fe	276	ug/l	200	B	SBC44

Accreditation Codes: * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted
For Microbiological determinands O or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered. I/S = Insufficient sample

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21 Weeks after Installation (Color)

Certificate of Analysis



**SEVERN
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ENVIRONMENTAL LEADERSHIP



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Sample **3** Laboratory Number: **378186**
of **3** Report Number: **BR/343007/2006** Issue **1**

Sample Source: **Cambridge Water Company**
Sample Point Description: **Cambridgeshire Water Company**
Sample Description: **HILTON HOTEL PORTSMOUTH CENTRAL HEATING SYSTEM**

Sample Date: **03 May 2006** Sample Received: **03 May 2006** Analysis Complete: **05 May 2006**


Test Description	Result	Units	Limit	Accreditation	Method
Colour	4.0	mg/l Pt/Co	20	B	SBE17/SBE5

Accreditation Codes: * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted
For Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered. I/S = Insufficient sample

Signed:  Name: **T. Down** Date: **08 May 2006**
Title: **Production Manager**


22 Weeks After Installation (Color)

Certificate of Analysis



**SEVERN
TRENT**

ENVIRONMENTAL LEADERSHIP



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Sample **2** Laboratory Number: **386984**
of **3** Report Number: **BR/344300/2006** Issue **1**

Sample Source: **Cambridge Water Company**
Sample Point Description: **Cambridgeshire Water Company**
Sample Description: **HILTON BOILER WATER - PORTSMOUTH**

Sample Date: **09 May 2006** Sample Received: **09 May 2006** Analysis Complete: **12 May 2006**

Test Description	Result	Units	Limit	Accreditation	Method
Colour	<0.7	mg/l Pt/Co	20	B	SBE17/SBE5

Accreditation Codes: * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted
For Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered. I/S = Insufficient sample

Hilton Portsmouth-5-(20080226)