

NMR Pipetector Installation Report

– A water main in Hokkaido, Japan –

Anti-corrosion device

Japan System Planning Co., Ltd.

◆ Background and summary

The water main in Hokkaido's city began its service in 1964 in a cottage district with its gross area of 6.3 million km² (7.5 million yd²). It uses galvanized steel for the main parts and polyethylene for branch parts.

The water main was suffering from issues related to corrosion and zinc eluting into the tap water.

The city planned a pipe replacement to solve these problems, but the estimated replacement cost was ¥3 billion, about \$30 million. The cost would be an enormous financial burden for the city. It, therefore, decided to solve the problems by introducing NMR Pipetector.

As a result, the city installed 27 NMR Pipetector in total at the cost of ¥100 million, 1 \$ million.

It was 1/30 than the replacement work cost.

At first, the city installed 2 NMR Pipetector as a trial on Oct. 30th, 2008, to test the effectiveness. Only after one month of the installation, NMR Pipetector successfully achieved the goal.

The city additionally installed 25 units in the following year to protect the whole cottage district.

◆ Details

① Testing on stopping iron elution

We attached a solenoid valve on a water tap to keep the flow consistent during filtering tests before and after installation. We then attached a while filter to the solenoid valve and let the water run before installing the device. After three days, the filter was discolored as it detected a high level of iron at 26 mg/L.

After a month of installation, we carried out a three-day filtering test again from Dec. 6th to 8th. The discoloration on the filter, which was reddish-brown in the previous filtering, improved a lot, and the level of iron content captured in it decreased drastically to 10 mg/L.

	Before	After a month
Iron content	26 mg/L	10 mg/L

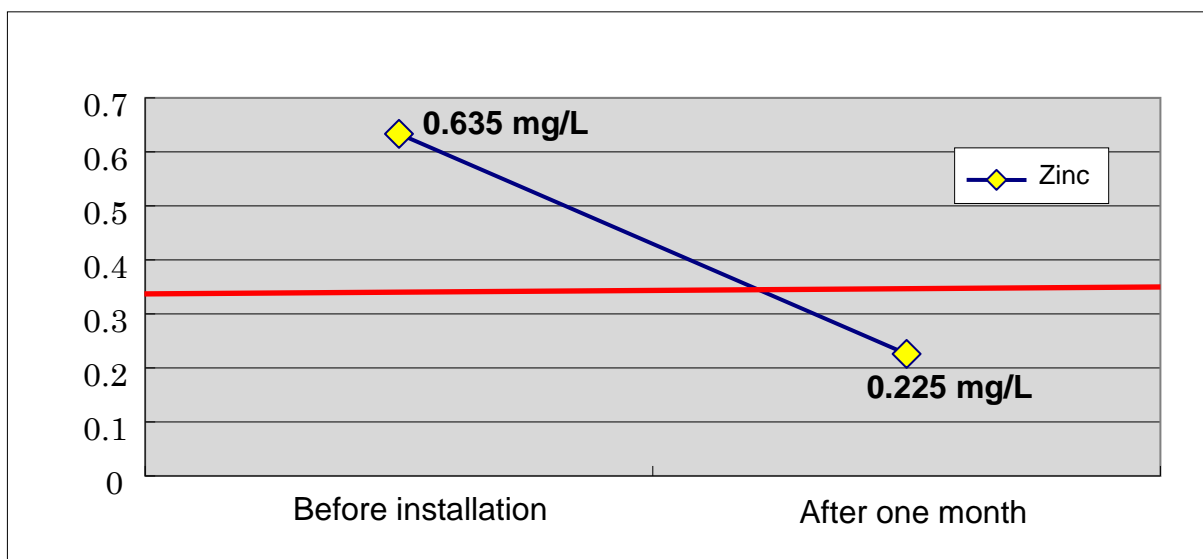
*Filters tested at the Tokyo Food Hygiene Association / the Tokyo Food Technology Research Institute

② Testing on stopping zinc elution

Before installing NMR Pipetector, the zinc content level sampled from a pressure reduction tank was **0.085 mg/L on average**. The amount of zinc content sampled from a water tap was **0.72 mg/L on average**. It means a high level of zinc was eluting from the pipe between the tank and the faucet.

One month after the installation, the tank's zinc level decreased to **0.07 mg/L on average** whereas that at the water tap also dropped to **0.295 mg/L on average**. From these results, the total elution of zinc was reduced to **0.255 mg/L**.

Timing	Place	Zu (mg/L)	Result
Before installation	Ⓐ Pressure reduction tank	Ave. 0.085	Standard raw water
	Ⓑ Water tap	Ave. 0.72	A significant amount of zinc eluting in the pipework
Elution level of zinc before installation Ⓑ 0.72 mg/L minus Ⓐ 0.085 mg/L		0.635	A significant amount of zinc eluting in the pipework
After one month	Ⓐ Pressure reduction tank	Ave. 0.07	Standard raw water
	Ⓑ Water tap	Ave. 0.295	Elution of zinc eased
Elution level of zinc after installation Ⓑ 0.295 mg/L minus Ⓐ 0.07 mg/L		0.225	Elution of zinc eased



NMR Pipetector installed locations

Explanatory note	
● : NMR Pipetector for 200-mm pipe	PT-200DS x 1
● : NMR Pipetector for 150-mm pipe	PT-150DS x 5
● : NMR Pipetector for 100-mm pipe	PT-100DS x 9
● : NMR Pipetector for 65 ~ 80 mm pipe	PT-75DS x 9
● : NMR Pipetector for 40 ~ 50 mm pipe	PT-50DS x 3

Total 27 units: 6 in District A, and 21 in District B

