

## 1. Introduction

All of the rust-stabilizing surface treatment now used in weathering steel are organic solventborne coatings, and most are resin-based<sup>1)</sup>. The volatile organic compounds (VOC) contained in organic solventborne coatings generate suspended particulate matter (SPM) and photochemical oxidants. Measures must therefore be taken to reduce the emissions of VOC<sup>2)</sup>.

JFE Steel has succeeded in commercially producing the world's first waterborne rust-stabilizing coating. The coating is called CUPTEN COAT<sup>TM</sup> AQUA<sup>3,4)</sup>. The features and performance of CUPTEN COAT<sup>TM</sup> AQUA are

City, Mie Pref.) was coated with CUPTEN COAT™ AQUA. Figure 1 shows the surface appearance of the bridge eight years after the coating was applied. Rust overflow is observed on the surface of the non-coated weathering steel, whereas no rust overflow is observed on the surface of treated with CUPTEN COAT™ AQUA. The coating remains on the steel surface in the area coated with the rust-stabilizing surface treatment, and no local corrosion is observed. Thus, the treated area exhibits a good appearance with scarcely any mottling.

### 3.2 Results of Surface Observation

Figure 2 shows the result of an observation of a cross section of the coated area under a polarization microscope. The generated rust is dense, but no rusting from any part of the steel surface is observed under the CUPTEN COAT™ AQUA film. The formation of a continuous and highly protective rust layer on the steel surface can be expected in the future.

### 4. Concluding Remarks

As described above, CUPTEN COAT™ AQUA is a

waterborne coating capable of suppressing the emission of VOC. Once applied, it has functions to sufficiently suppress rust outflow in coastal areas.

After CUPTEN COAT™ AQUA is applied once, there is no need for reapplication. Therefore CUPTEN COAT™ AQUA is likely to contribute to the design and construction of environmentally friendly steel bridges and steel structures as a rust-stabilizing surface treatment for weathering steel.

### References

- 1)