Specially developed testing machine

Beam

Eccentric rotary cam

Hydraulic motor

Loading plate

Springs

Sleeper
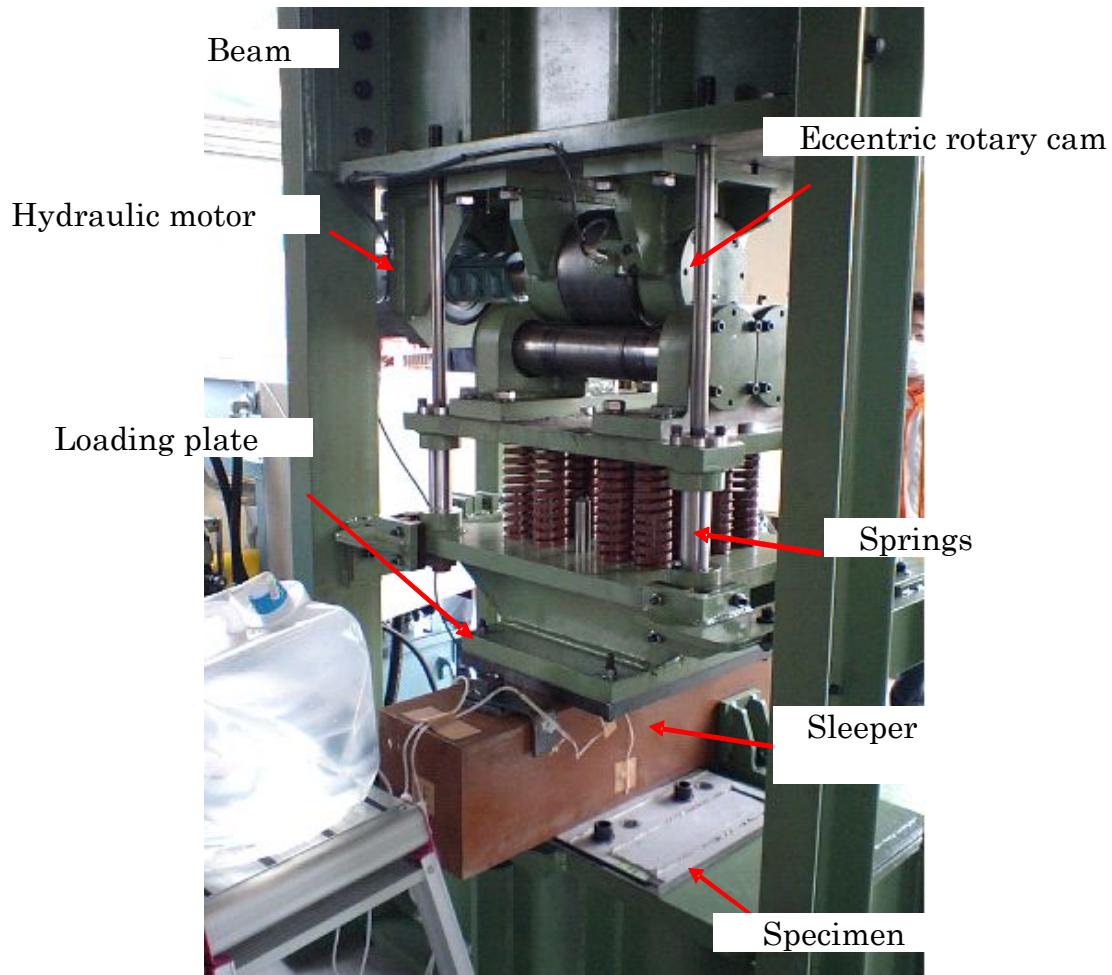
Specimen

Load amplitude: 88 kN
Max. Load : 108 kN
Min. Load : 20 kN


Railway sleeper
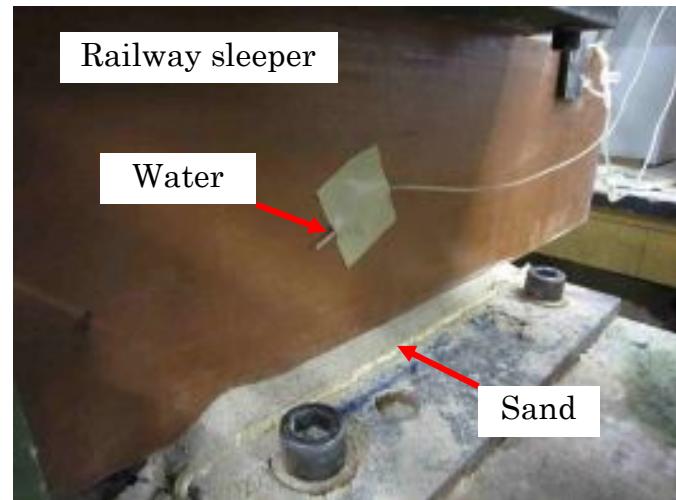
Water

Sand

Water : 50 mL/min
Sand : Silica sand
   (less than 0.6 mm)

## Specimen size
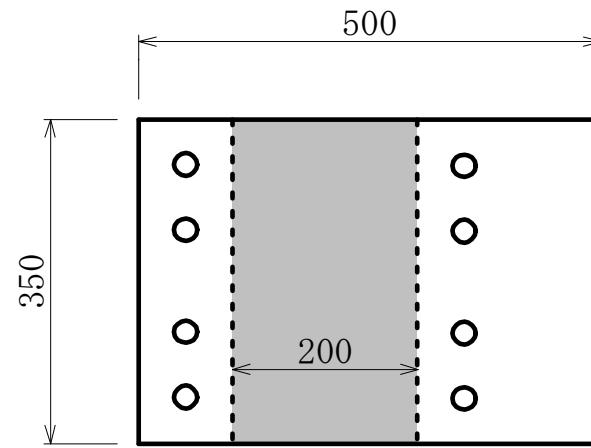
Measuring positions for coating thickness
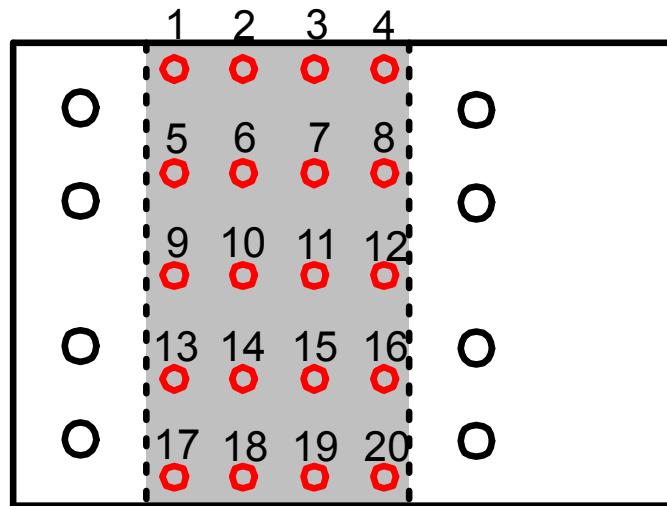
Electromagnetic coating thickness tester

B-7 paint coating

| (a) 0 cycle | (b) 1,000 cycles | (c) 63,000 cycles |

Reduction ratio (%)

Number of loading cycles ($\times 10^5$)

45,000〜63,000 cycles
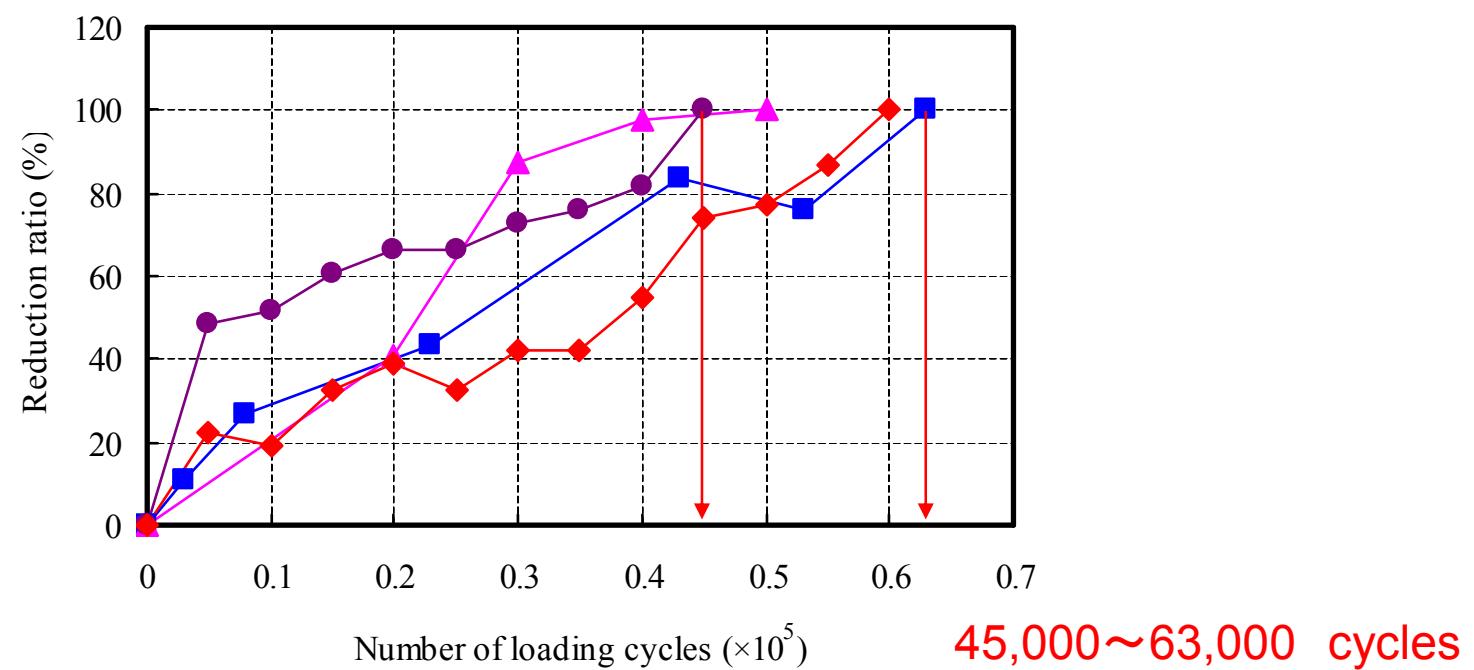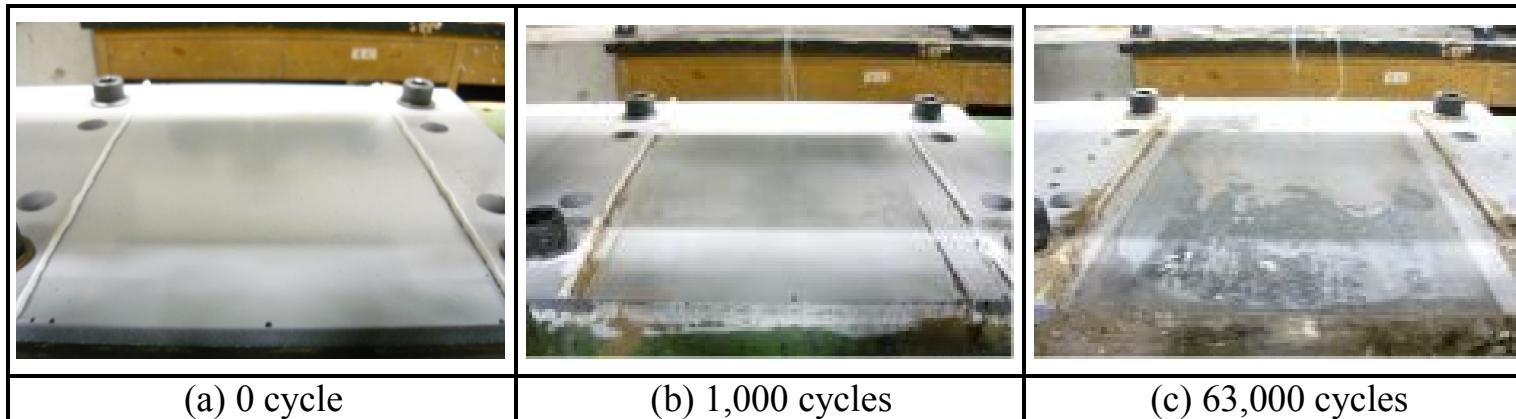
Curve fitting
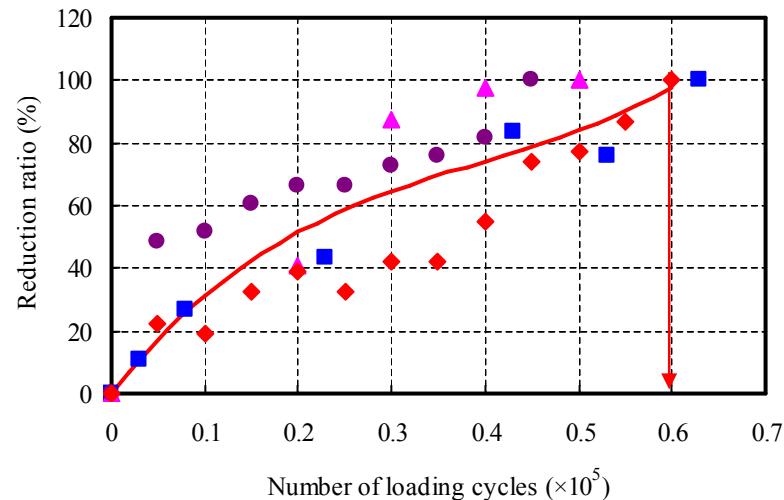
B-7 paint coating
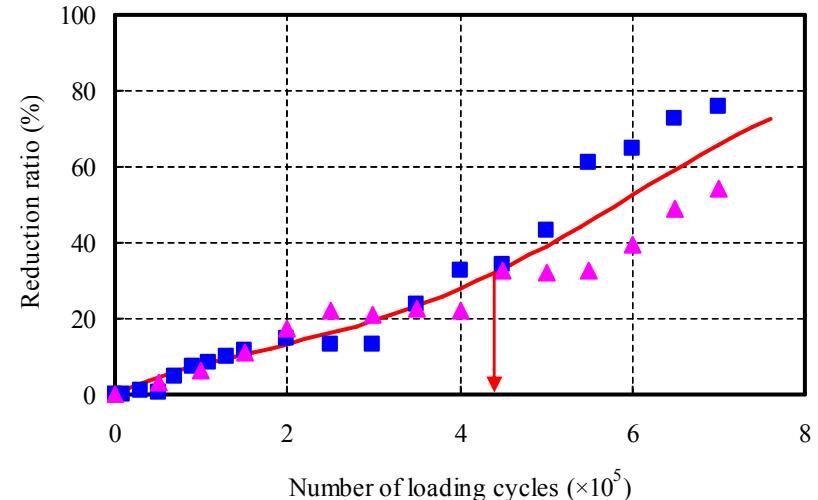
Epoxy coated glass fiber sheet
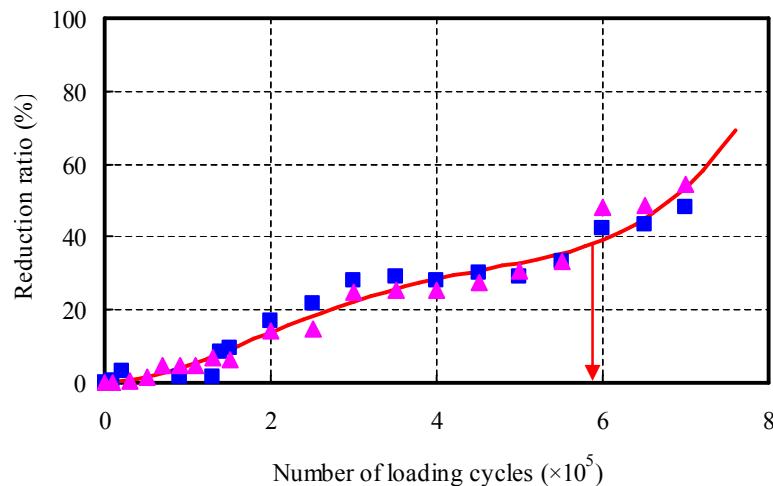
Epoxy coated carbon fiber sheet

B-7 paint coating

$$y = 612.719x^3 - 725.423x^2 + 377.832x$$

Epoxy coated glass fiber sheet

$$y = -0.051x^4 + 0.791x^3 - 3.180x^2 + 10.296x$$

Epoxy coated glass fiber sheet

$$y = 0.111x^4 - 1.431x^3 + 5.569x^2 + 0.598x$$

y : reduction ratio (%),

x : number of loading cycles ($\times 10^5$)