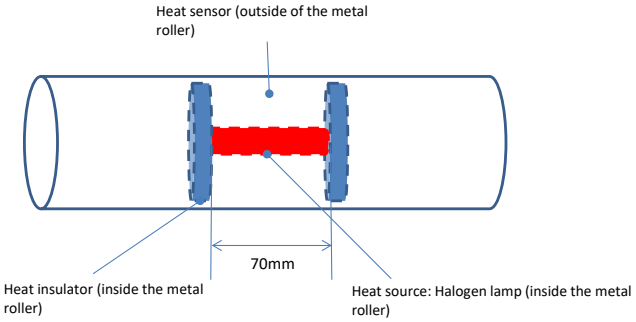
Metal roller heat transfer comparison - perpendicular

1. Measuring method



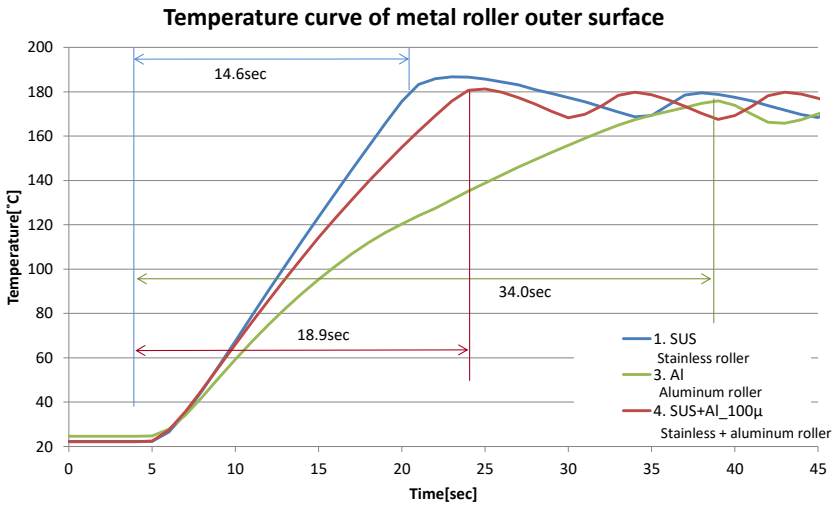
・Install heat source inside the metal roller (halogen lamp)
・Install heat sensor in the middle of the outside surface of the metal roller
・Measure the external temperature of the metal roller with the heat sensor installed on the middle of the outside surface of the metal roller.

2. Measurement results

Purpose: Measuring the temperature change on the outside of the metal roller, and comparing with ones made with different materials

Test samples: "Stainless roller", "Stainless + AL roller", "Aluminum roller"
All test samples are coated with fluororesin on the outside, and Okitsumo coating on the inside.

Stainless roller	: SUS 304, outer diameter φ 30 mm, SUS plate thickness 200 μm
Stainless + aluminum roller	: SUS + AL, OD φ30 mm, SUS plate thickness 200 μm + AL plate thickness 100 μm
Aluminum roller	: A 5052, outer diameter φ 30 mm, AL plate thickness 500 μm



Stainless roller heated up the quickest, and the time it took to reach 180℃ was less than half the time it took for aluminum roller (14.6 seconds for stainless roller, 34 seconds for aluminum roller)

From these results, it is evident that the stainless roller is excellent in transferring heat in perpendicular direction.
The double-layered roller (one stainless layer + one aluminum layer) was not as efficient in transferring heat compared to the stainless roller, but was still much better at transferring heat in perpendicular direction compared to aluminum roller.
(18.9 seconds for double-layered roller, 34 seconds for aluminum roller)