

Test Report

Insulation Joint Adhesive tape JTA

January 31, 2020

Inaba Denki Sangyo. Co., Ltd.

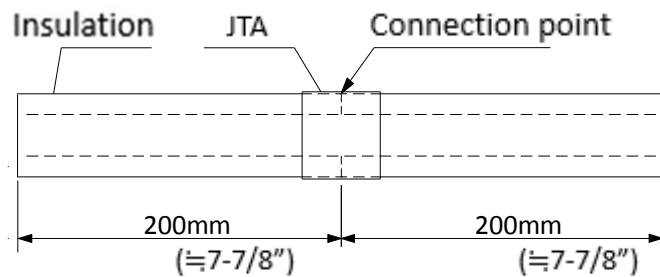
Research & development division

1. Adhesive performance

We tested adhesive strength of Insulation Joint Adhesive Tape JTA and confirmed its performance.

(1) Test sample

Butted 200mm ($\approx 7\text{-}7/8''$) long and thickness 10mm insulation for copper pipe $\phi 25.40$ (1") with each other, and 200mm long and thickness 20mm ($\approx 3/4''$) insulation for copper pipe $\phi 25.40$ with each other, then connected by JTA, overlapping 10mm ($\approx 1/2''$). Held attaching part of JTA by hand strongly and held the tape about 10 times to make it fit.



(2) Test method and conditions

Place the specimen on the tensile tester and measure the maximum tensile load until the tape was displaced or broken by pulling the both ends of insulation.

- Environmental temperature: 23°C ($\approx 73^\circ\text{F}$)
- Tensile speed: 20 mm/min ($\approx 3/4''/\text{min}$)

(3) Test results

The test results are shown below.

Table-2 Maximum tensile load

Test materials	N=1	N=2	N=3	Average
Insulation thickness: 10mm ($\approx 0.39''$ or $3/8''$)	405.6N (41.4Kgf) (≈ 91 lbs)	402.8N (41.1Kgf) (≈ 90 lbs)	412.8N (42.1Kgf) (≈ 93 lbs)	407.1N (41.5Kgf) (≈ 91 lbs)
Insulation thickness: 20mm ($\approx 0.78''$ or $3/4''$)	614.2N (62.7Kgf) (≈ 138 lbs)	625.4N (63.8Kgf) (≈ 140 lbs)	606.8N (61.9Kgf) (≈ 136 lbs)	615.5N (62.8Kgf) (≈ 138 lbs)

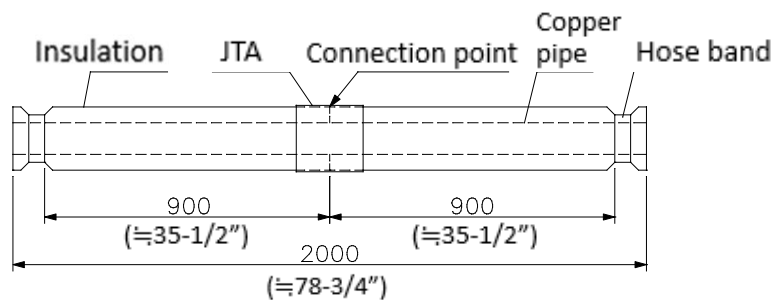
Post-test conditions: Insulation dropped out of JTA. No material destruction for both of insulation and JTA.

2. Connection performance against thermal shrinkage on insulation

Confirmed if JTA deviated from the attached point of insulation against thermal shrinkage on insulation due to temperature change,

(1) Test sample

A 2,000mm ($\approx 78\text{-}3/4''$) Inaba Denko insulated lineset, which was cut to 1,000mm each ($\approx 39\text{-}3/8''$) at the center of the pipe, connected with JTA, and left to stand 24 hours. Overlapped 10mm ($\approx 1/2''$) of JTA and Tied both ends of insulation with hose bands in order to prevent deviation at both ends of the specimen. Incidentally, insulation size was the one for $\phi 38.10$ ($\approx 1\text{-}1/2''$) copper pipe and was 20mm ($\approx 0.78''$ or $3/4''$) thickness.

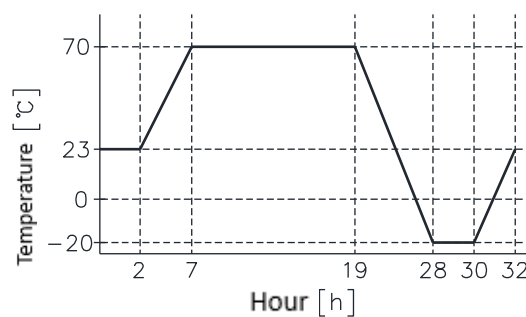


(2) Test method and conditions

Left to stand at $23^{\circ}\text{C} \approx 73^{\circ}\text{F}$ (normal temperature) for 2 hours, and then gradually increased the temperature to $70^{\circ}\text{C} \approx 158^{\circ}\text{F}$ in a thermostatic chamber, and left to stand at $70^{\circ}\text{C} \approx 158^{\circ}\text{F}$ for 12 hours.

Thereafter, gradually lowered the temperature to $-20^{\circ}\text{C} \approx -4^{\circ}\text{F}$ in a thermostatic chamber, and left to stand at $-20^{\circ}\text{C} \approx -4^{\circ}\text{F}$ for 2 hours.

Thereafter, gradually increased the temperature in the thermostatic chamber, and checked to see if any deviation of JTA at $23^{\circ}\text{C} \approx 73^{\circ}\text{F}$.



Graph-1 Temperature Cycle

(3) Test results

No tape slippage, deviation or gaps were generated at the points where insulation was connected to each other, and there was no change before and after the test.

Confirmed that there was sufficient adhesive force against thermal shrinkage force on insulation.