

Re: Melting process of FSX-E, FWX-E and TEX-E

Dear TEX-E Clients,

These are data of our internal evaluation not evaluated by third party. Please note that this technical brochure does not contain any specification for TEX-E, nor does it guarantee the performance of the wound components using TEX-E. It depends on a design and winding condition of that component whether a wound component using TEX-E meets the performance or not. Therefore, the customer is kindly requested to examine by itself the performance of the actual component.

Sincerely yours,

Technical Group II
Magnet Wire Division
Furukawa Electric Co., Ltd.

We investigated melting process of insulation film of FSX-E, FWX-E and TEX-E considering PCB assembling process using reflow oven and report the results as follows.

1. Sample

Following wires were wound on EPH13 bobbin.

FSX-E 0.11mm

FWX-E 0.11mm

TEX-E 0.20mm

2. Experimental

We observed surface of insulation film by microscope and recorded temperature simultaneously by increasing ambient temperature of a sample at a rate of 1 deg/sec. from room temperature. Thermocouples (T.C.) were placed just on winding surface and on the bottom of the bobbin (see Fig. 1). The temperature was controlled by using the bobbin side thermocouple.

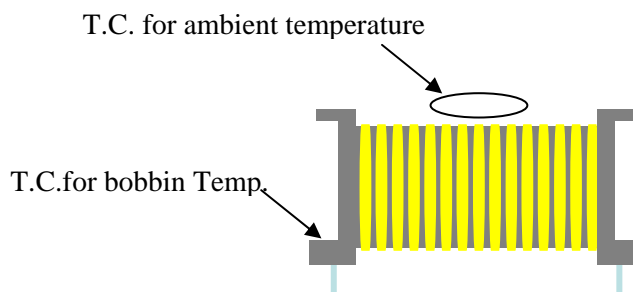


Fig. 1 Position of Thermocouples

3. Results

We show observation results in Photos 1 through 3.

Photos 1(a)-(e): FSX-E 0.11 mm @ 230°C – 260°C (ambient temperature)

Photos 2(a)-(h): FWX-E 0.11 mm @ 230°C – 272°C (ambient temperature)

Photos 3(a)-(m): TEX-E 0.20 mm @ 230°C – 270°C (ambient temperature)

4. Comments

In this experiment we found followings:

- For FSX-E, insulation film starts to melt at bobbin or ambient temperature of 250°C.
- For FWX-E and TEX-E, insulation film starts to melt at bobbin or ambient temperature of 260°C – 270°C.

Melting temperature difference between FSX-E and FWX-E or TEX-E may come from material difference of outer insulation layer. FSX-E's outer layer is Polyester and that of FWX-E and TEX-E is Polyamide

NOTE

These results are based on our experimental setup. In actual reflow soldering process, you may get different results because of difference in temperature profile in the oven. Please confirm the results with your wound component and your reflow oven.

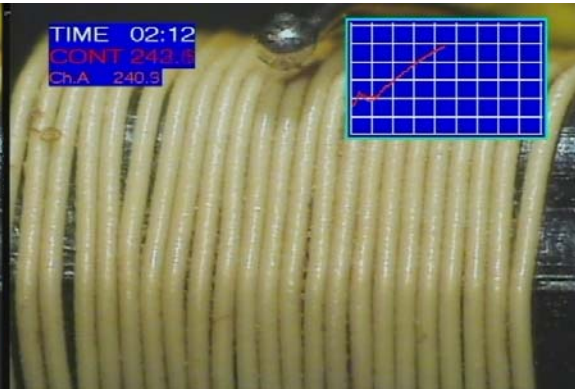
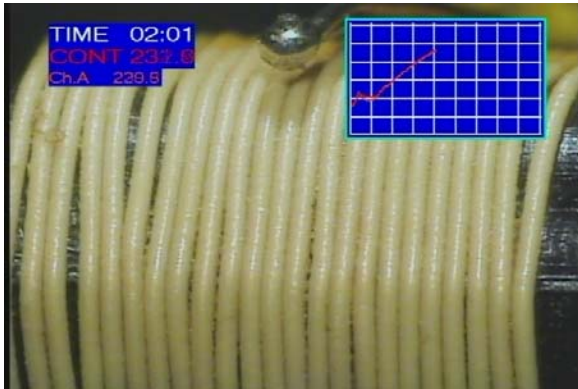


Photo 1(a): FSX-E 0.11mm 230°C (bobbin 237°C) Photo 1(b): FSX-E 0.11mm 240°C (bobbin 243°C)

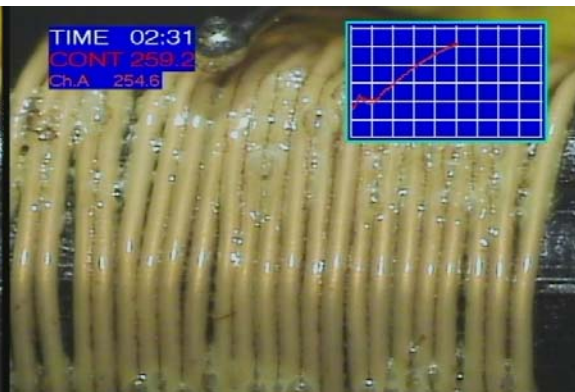
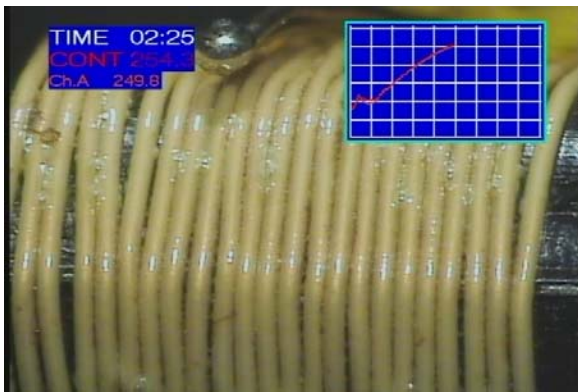


Photo 1(c): FSX-E 0.11mm 250°C (bobbin 254°C) Photo 1(d): FSX-E 0.11mm 255°C (bobbin 260°C)

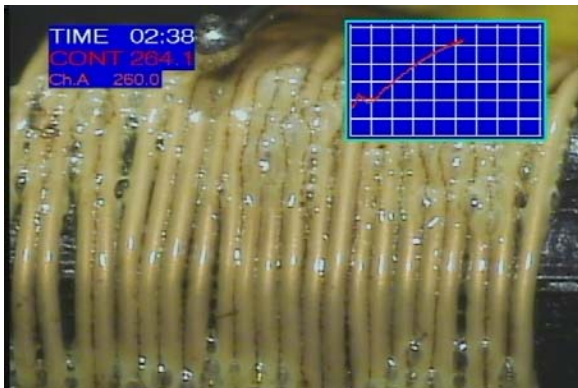


Photo 1(e): FSX-E 0.11mm 260°C (bobbin 264°C)

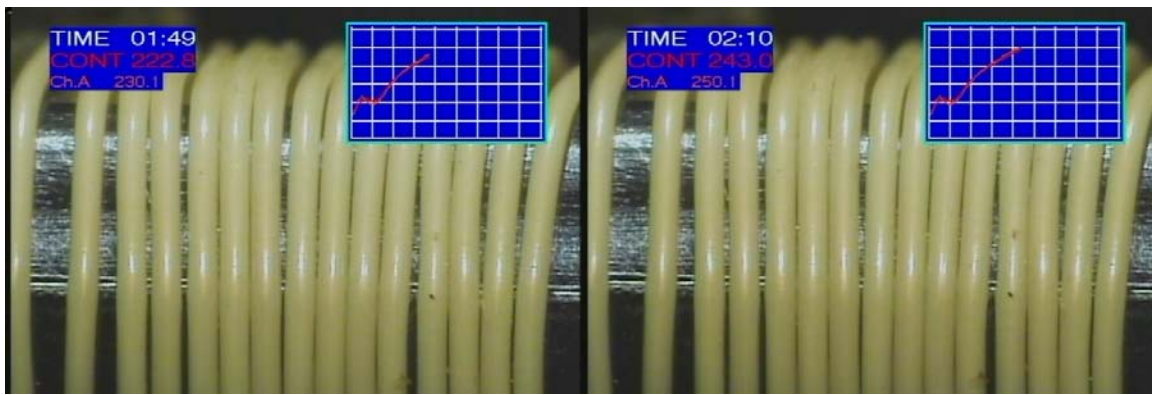


Photo2(a):FWX-E 0.11mm 230°C (bobbin 223°C) Photo2(b):FWX-E 0.11mm 250°C (bobbin 243°C)

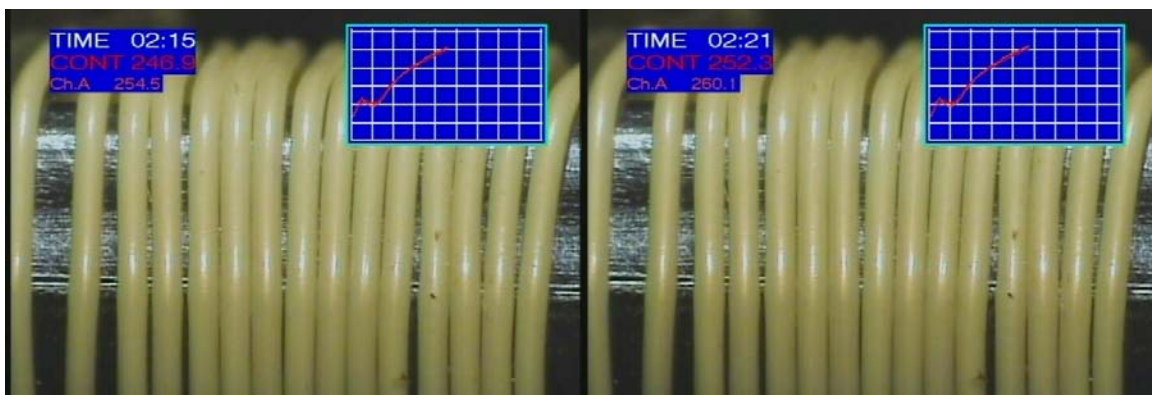


Photo2(c):FWX-E 0.11mm 254°C (bobbin 247°C) Photo2(d):FWX-E 0.11mm 260°C (bobbin 252°C)

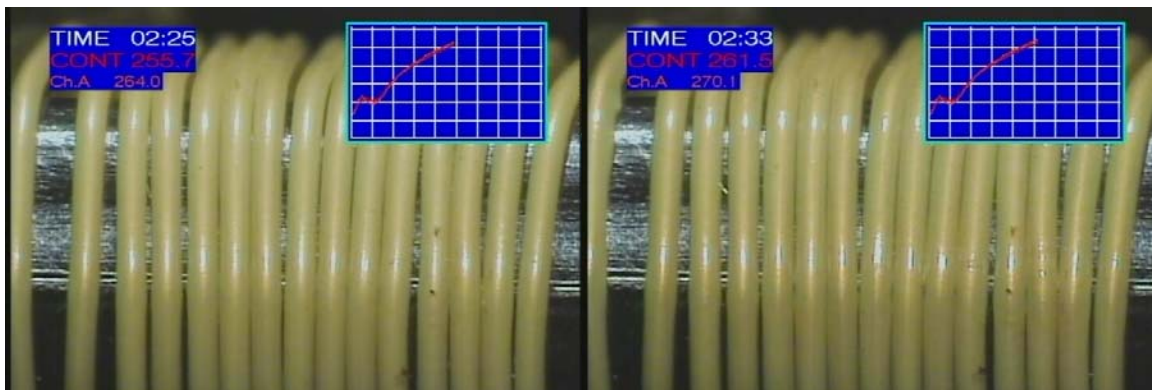


Photo2(e):FWX-E 0.11mm 264°C (bobbin 256°C) Photo2(f):FWX-E 0.11mm 270°C (bobbin 261°C)

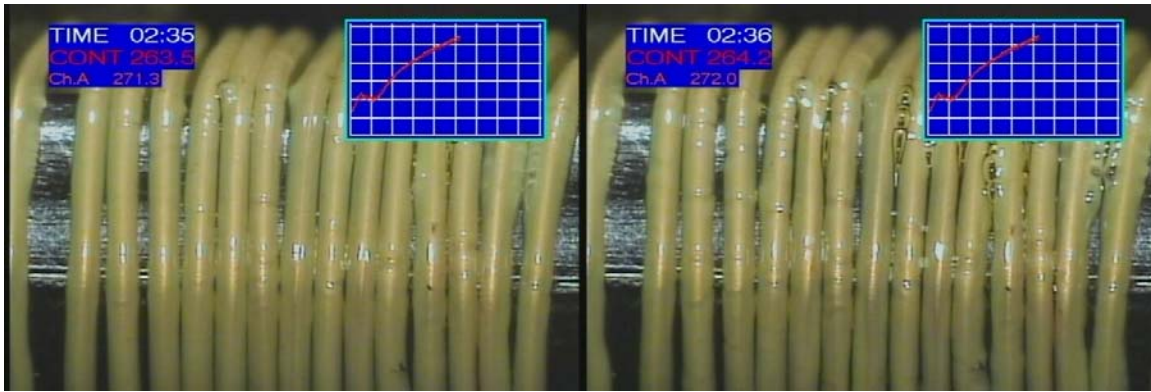


Photo2(g):FWX-E 0.11mm 271°C (bobbin 263°C) Photo2(h):FWX-E 0.11mm 272°C (bobbin 264°C)



Photo3(a):TEX-E 0.20mm 230°C (bobbin 225°C) Photo3(b):TEX-E 0.20mm 240°C (bobbin 234°C)



Photo3(c):TEX-E 0.20mm 251°C (bobbin 239°C) Photo3(d):TEX-E 0.20mm 260°C (bobbin 253°C)



Photo3(e): TEX-E 0.20mm 261°C (bobbin 254°C) Photo3(f): TEX-E 0.20mm 262°C (bobbin 255°C)

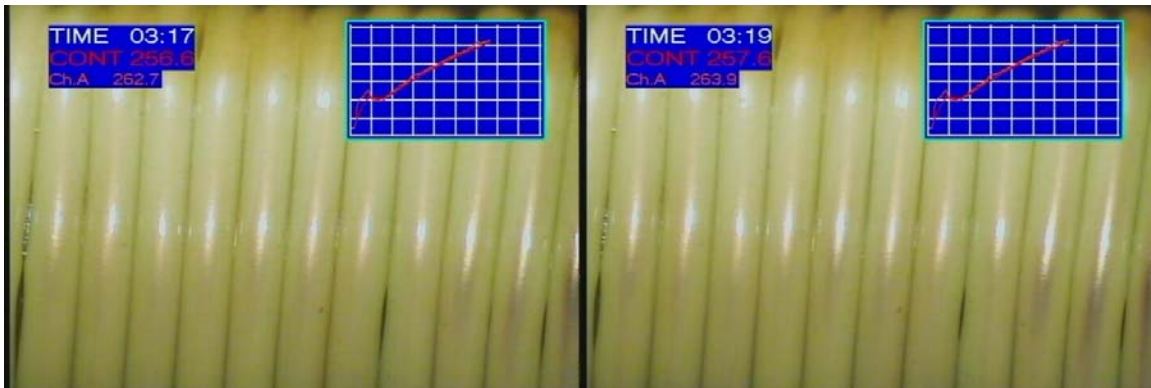


Photo3(g): TEX-E 0.20mm 263°C (bobbin 257°C) Photo3(h): TEX-E 0.20mm 264°C (bobbin 258°C)

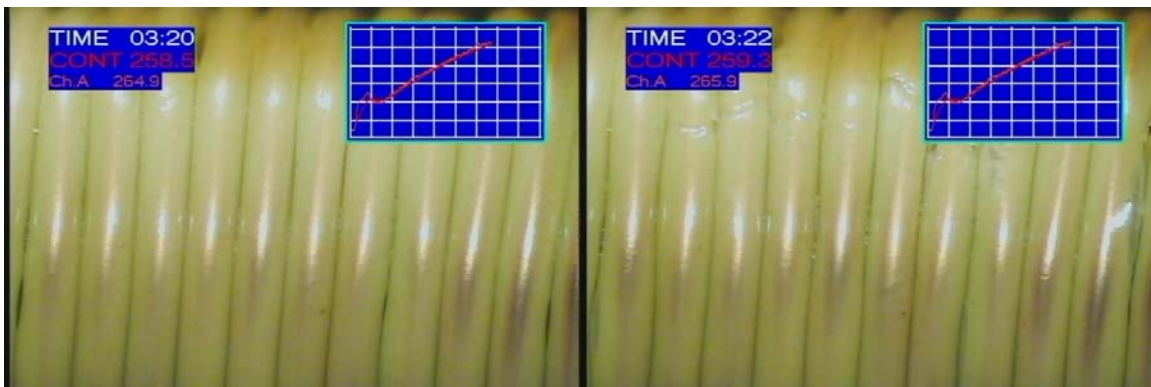


Photo3(i): TEX-E 0.20mm 265°C (bobbin 259°C) Photo3(j): TEX-E 0.20mm 266°C (bobbin 259°C)

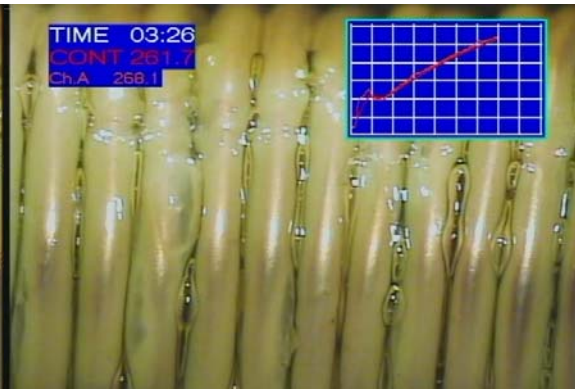
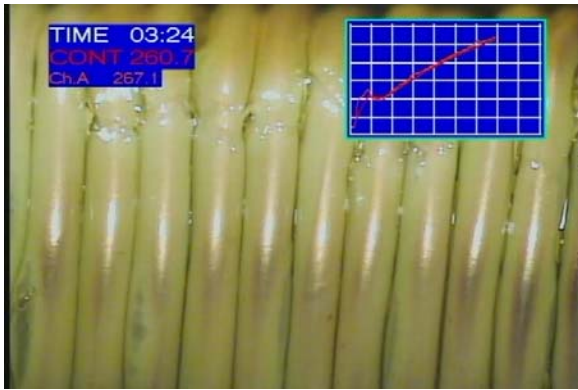


Photo3(k): TEX-E 0.20mm 267°C (bobbin 261°C) Photo3(l): TEX-E 0.20mm 268°C (bobbin 262°C)

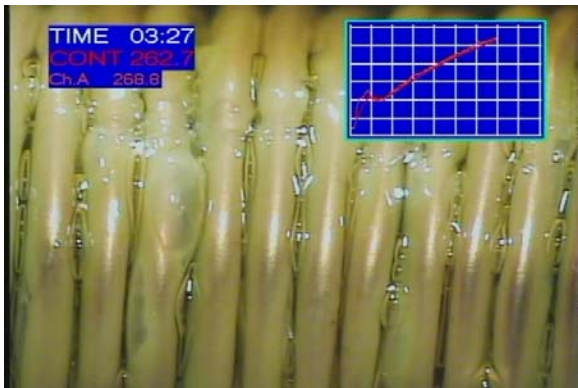


Photo3(m): TEX-E 0.20mm 269°C (bobbin 263°C)