# Status of CNT wire ESS R&D

July 22, 2019

J-PARC Slow Extraction G

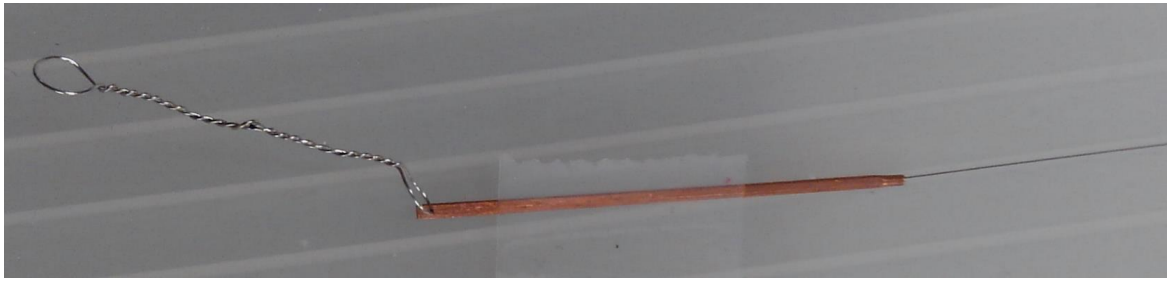
# CNT stranded wires by Hitz

CNT: Φ 10nm, L=300μm

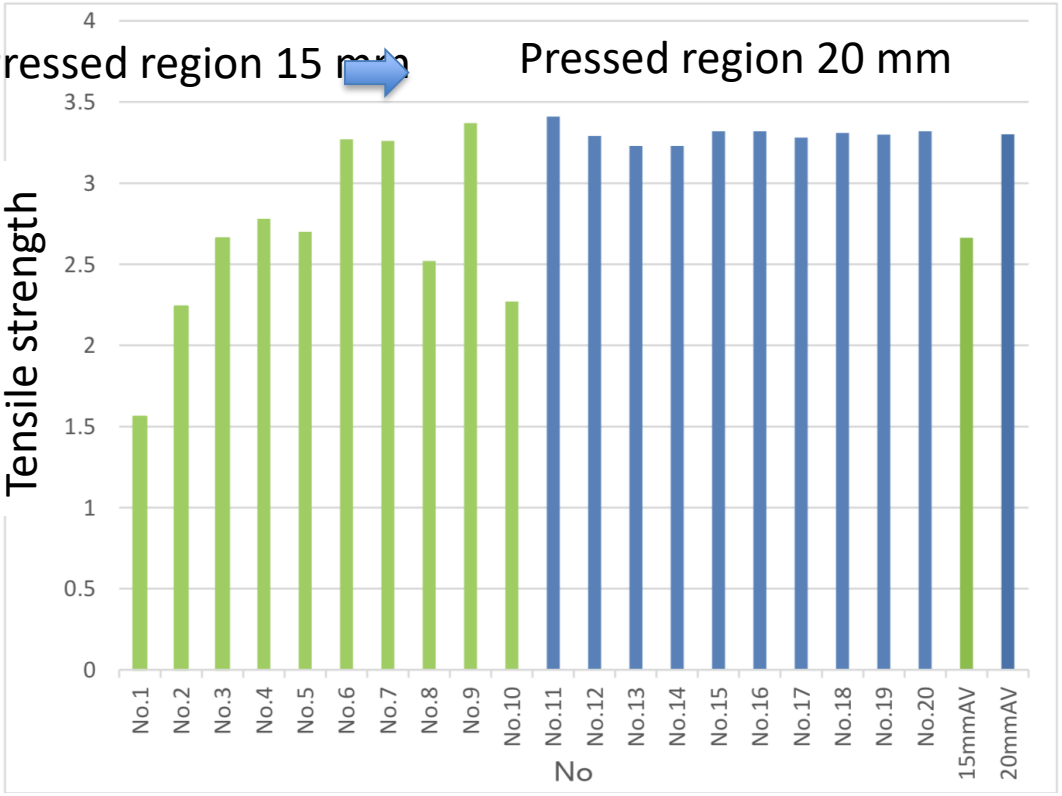
wire: Φ～76-81 μm (spec. >3.0N, >750Mpa)

Cupper tube cramping of both ends of CNT wire

Cupper (C1220) tube: Φ0.7 x Φ0.3 x 30L



# Tensile strength measurement with cupper tubes

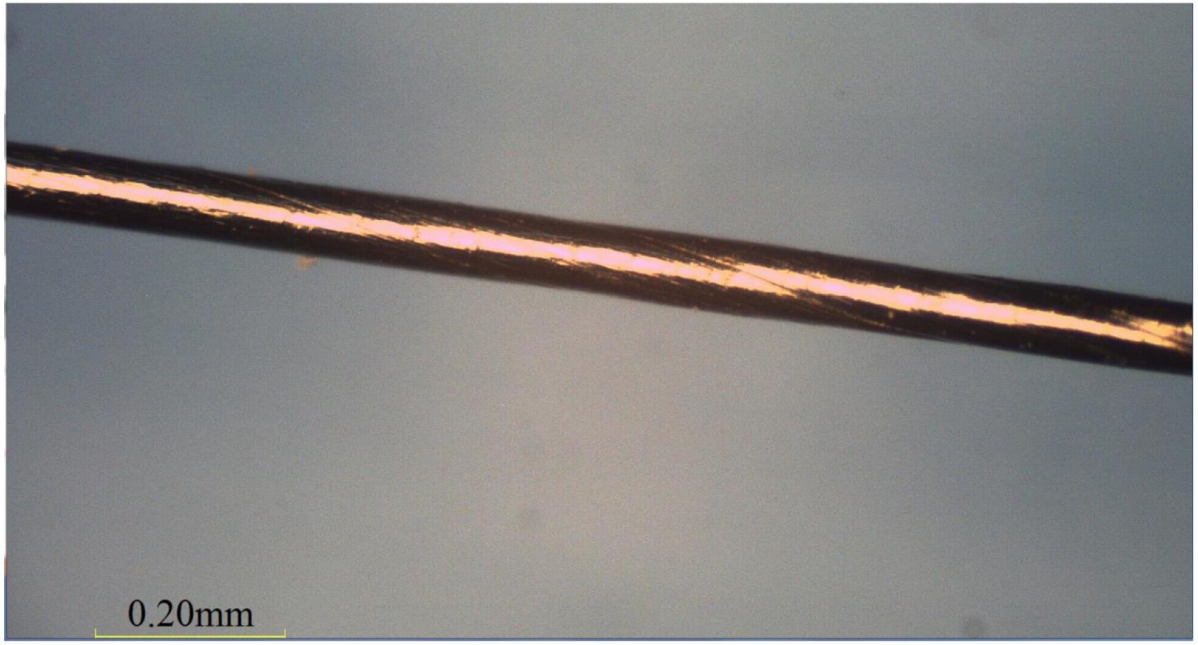



The tensile strength has been improved to be similar to the strength w/o the tubes

Before ultrasonic
alcohol cleaning

luster on surface
by increasing CNT density
on surface

Cabon nanotube （洗浄前）

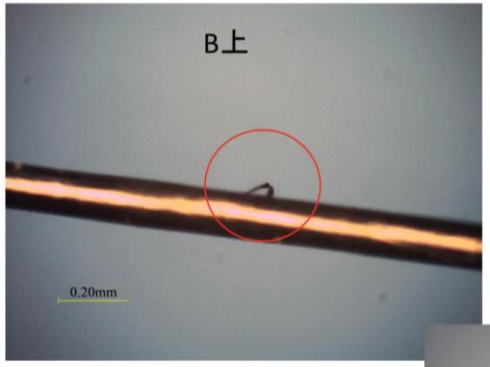


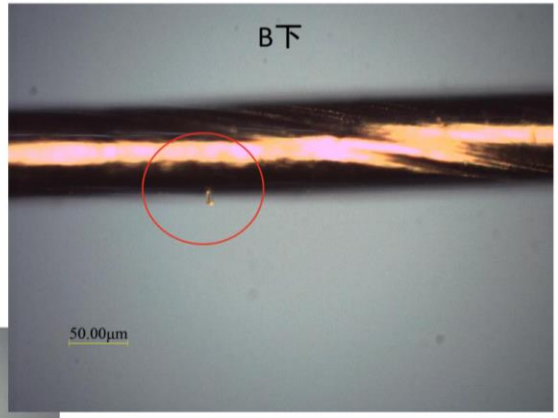

After ltrasonic
alcohol cleaning

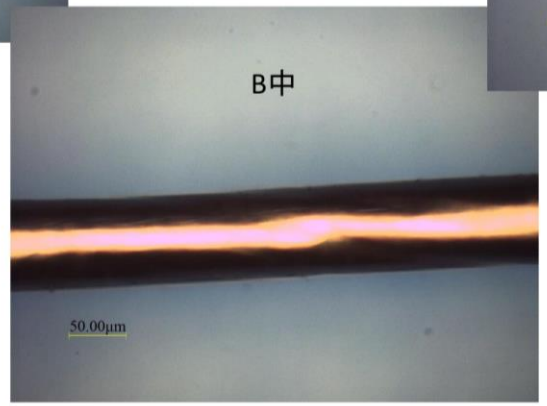
No luster on surface

Cabon nanotube （洗浄後）

Fray



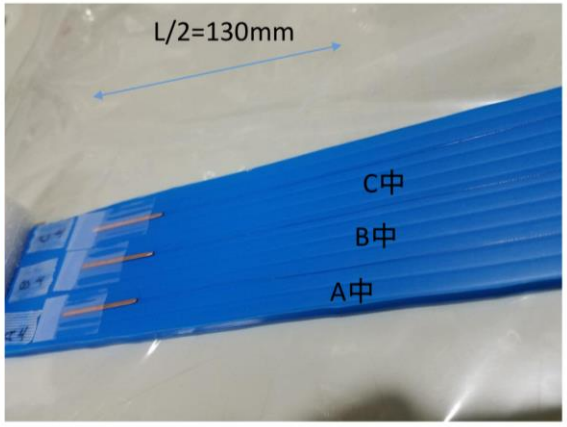



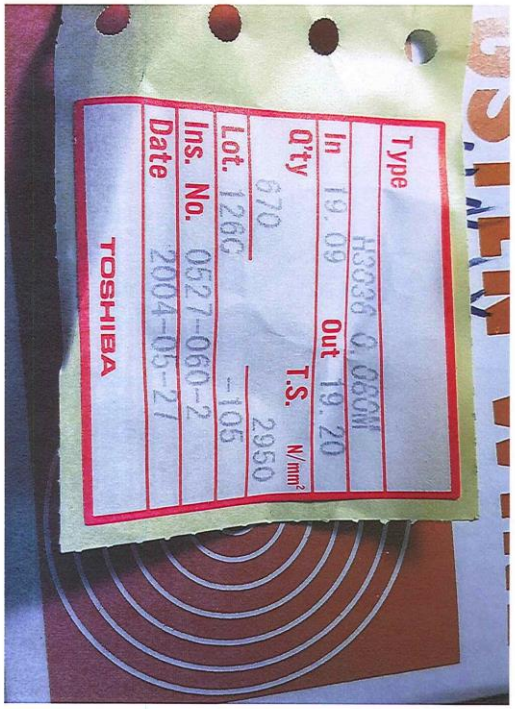

Frayed in 10mm from cupper tube edge

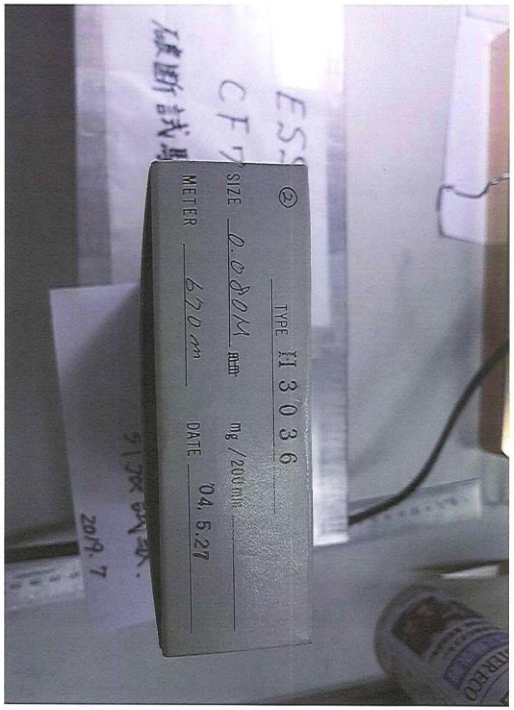
Frayed In 10mm from cupper tube edge

The wire center does not fray




W/Re (3%)  wires Φ80 μm  as reference of CNT wires

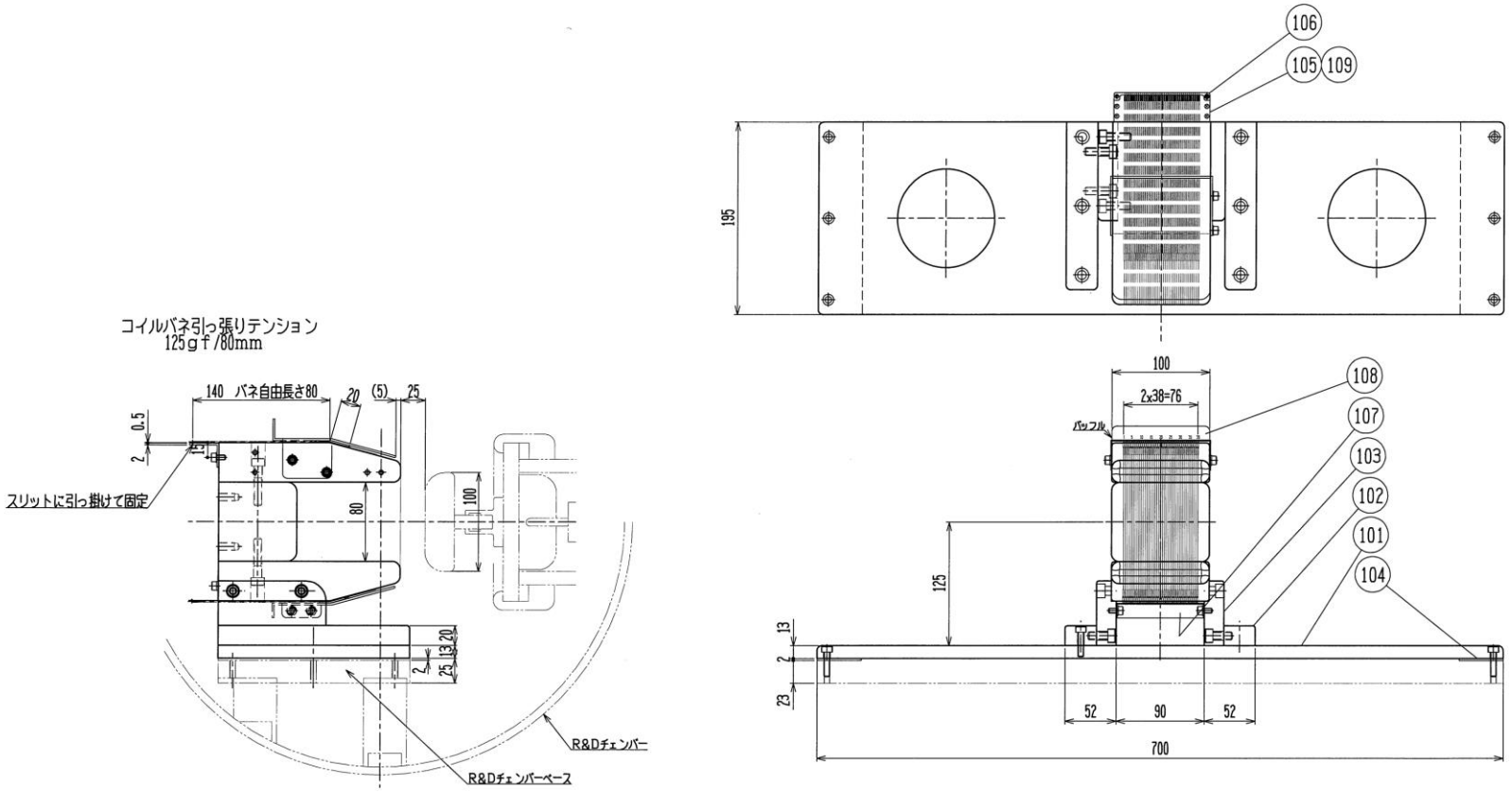


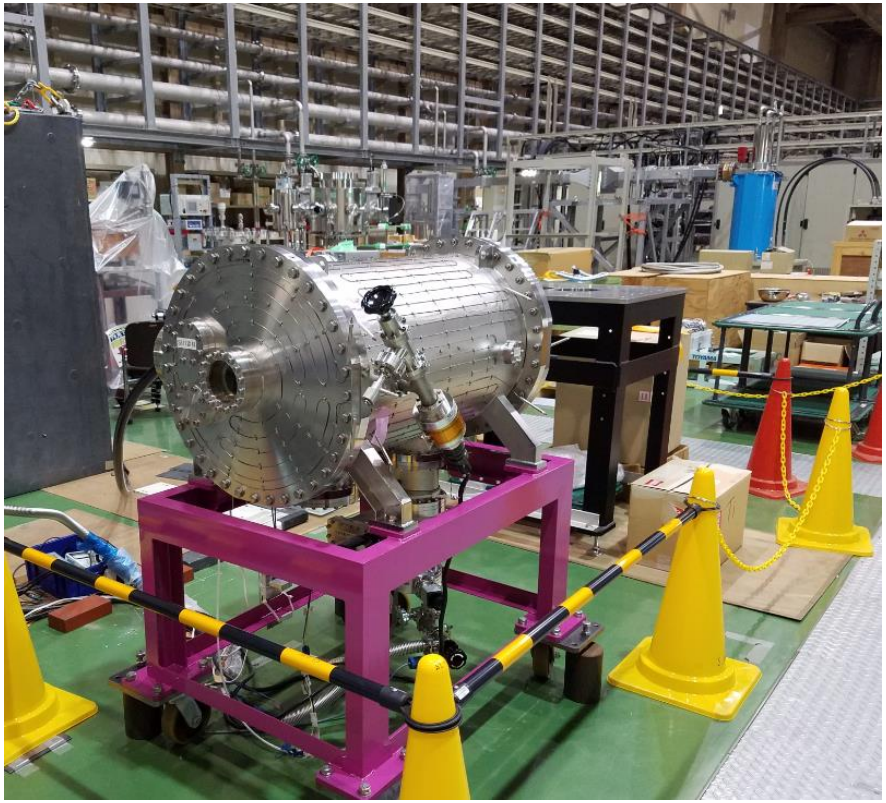

Tension strength with cupper tubes
(wire only spec. 2950 g/mm^2)

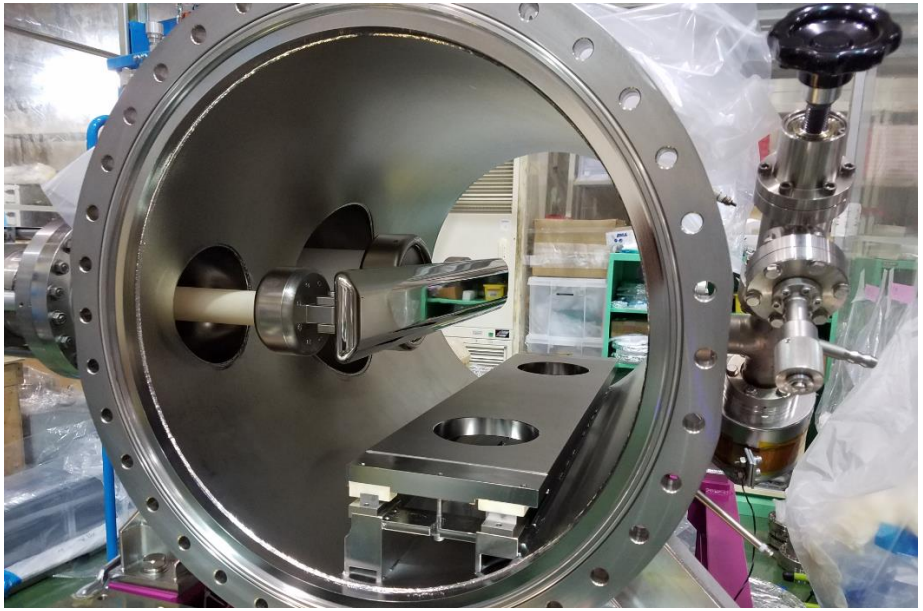
1. 14.5N
2. 14.6N
3. 14.3N
4. 14.3N
5. 13.1N

# Anode Yoke


コイルバネ引っ張りテンション
125gf/80mm
140 バネ自由長さ80
20
(5)
25
0.5
2
スリットに引っ掛けて固定
80
100
25
13
20
2
R&Dチェンバー
R&Dチェンバーベース
106
105
109
195
100
2x38=76
バッフル
108
107
103
102
101
104
125
13
2
23
52
90
52
700

# 2019/06/17~06/18 electrode installation





A 110 kV High voltage test w/o anode has been finished.
The W/Re wires anode will be installed at the beginning of Aug., 2019
After a high voltage test by the W/Re wires, the CNT wires anode will be installed and high voltage test will start (in Sep. 2019)