Development of

Aircraft Thermal Acoustic Insulation

Donacarbo Light Wool

(Use of 13 micro meter Carbon Fiber)

www.westjr.co.jp/photo/photo02.html

Insulation of all the Shinkansen 500 & 700 Series Vehicles (High Speed Railway of Japan)

Presented by Donac Co., Ltd.

Carbon Fiber Factory

Donac Co., Ltd.

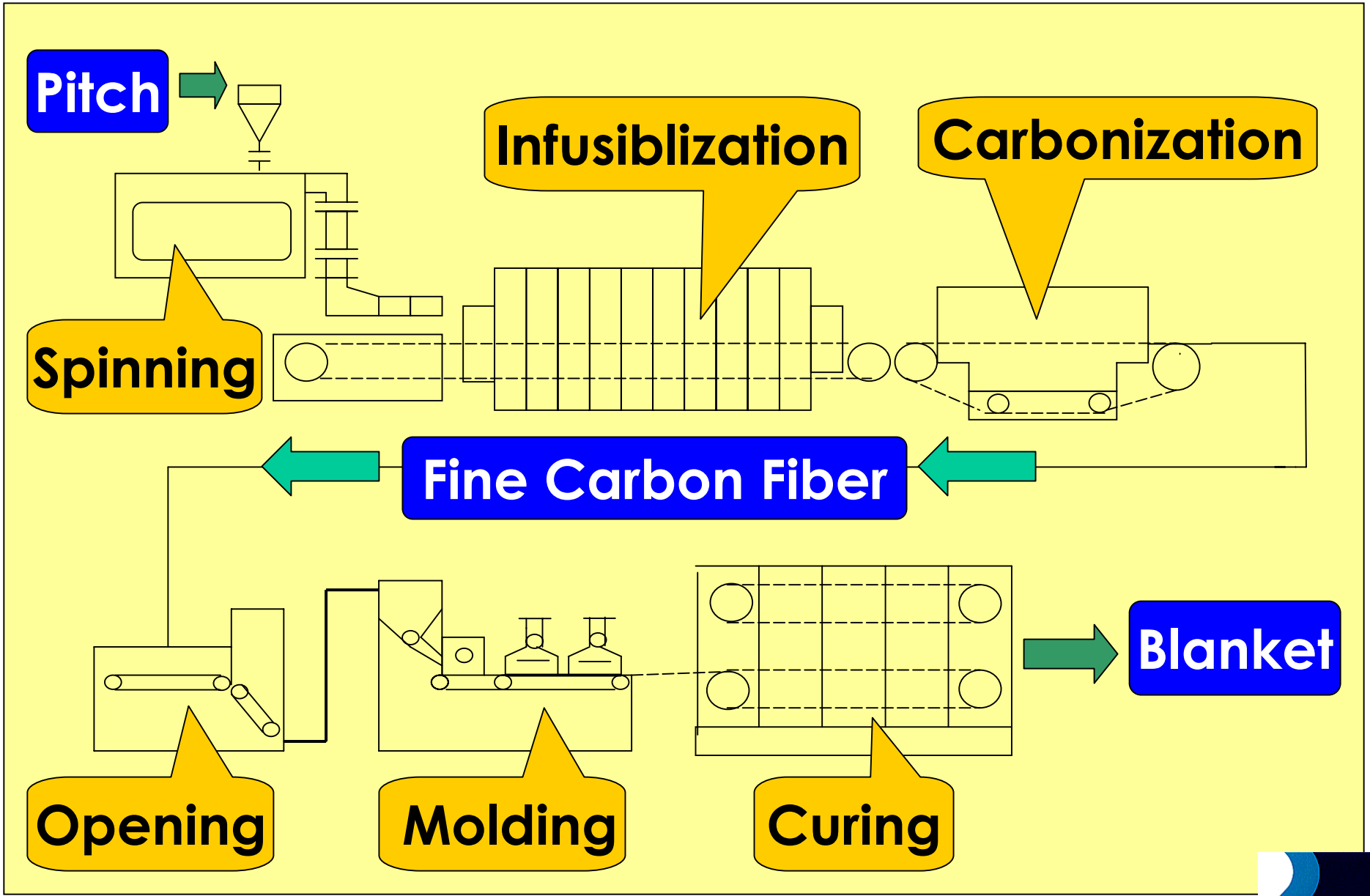
Osaka, Japan

Development Points of Aircraft Thermal Acoustic Insulation

1. Fine Carbon Fiber Manufacturing Technology

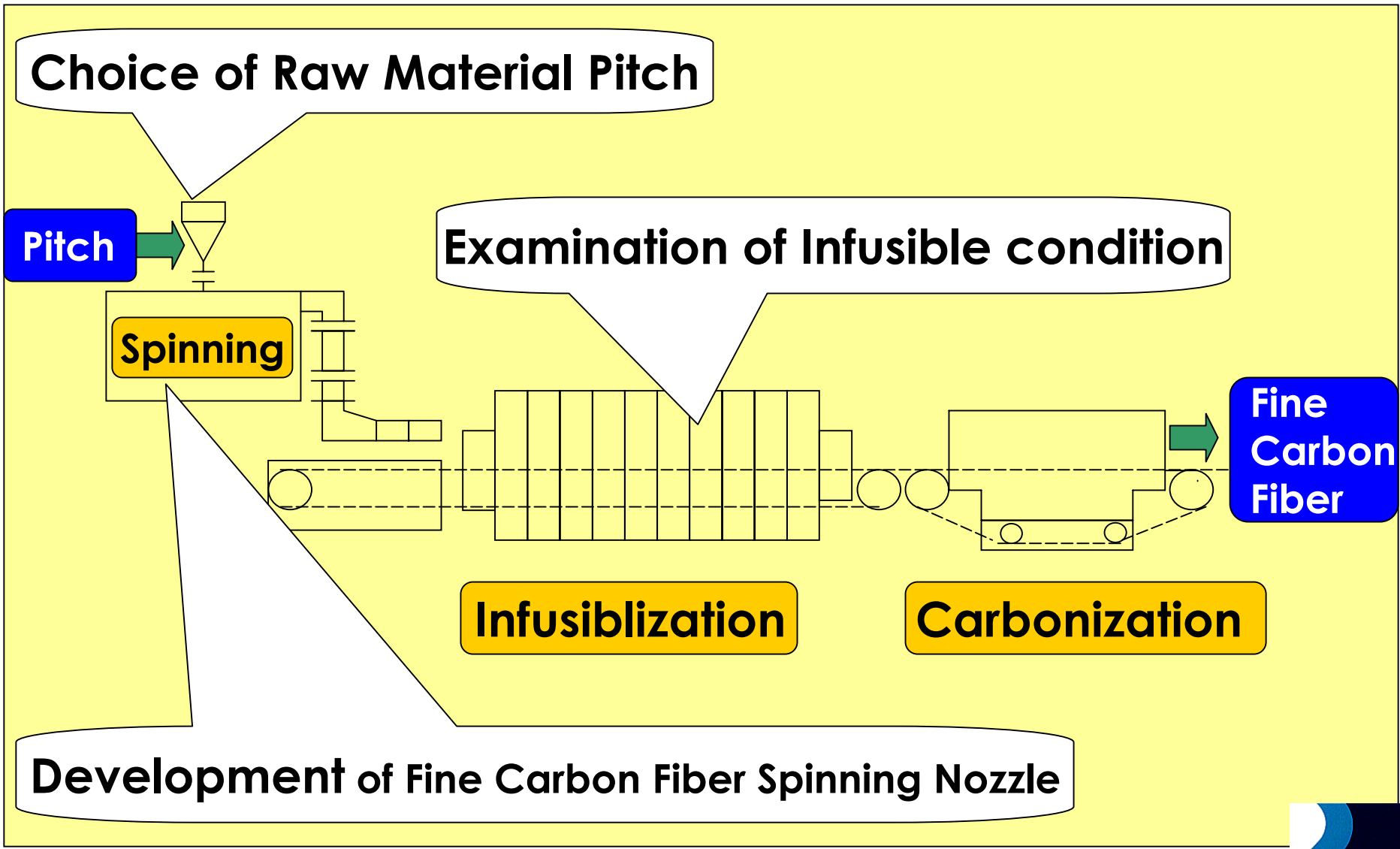
2. Fine Carbon Fiber Insulation Processing Technology

Process Flow of Fine Carbon Fiber & Insulation



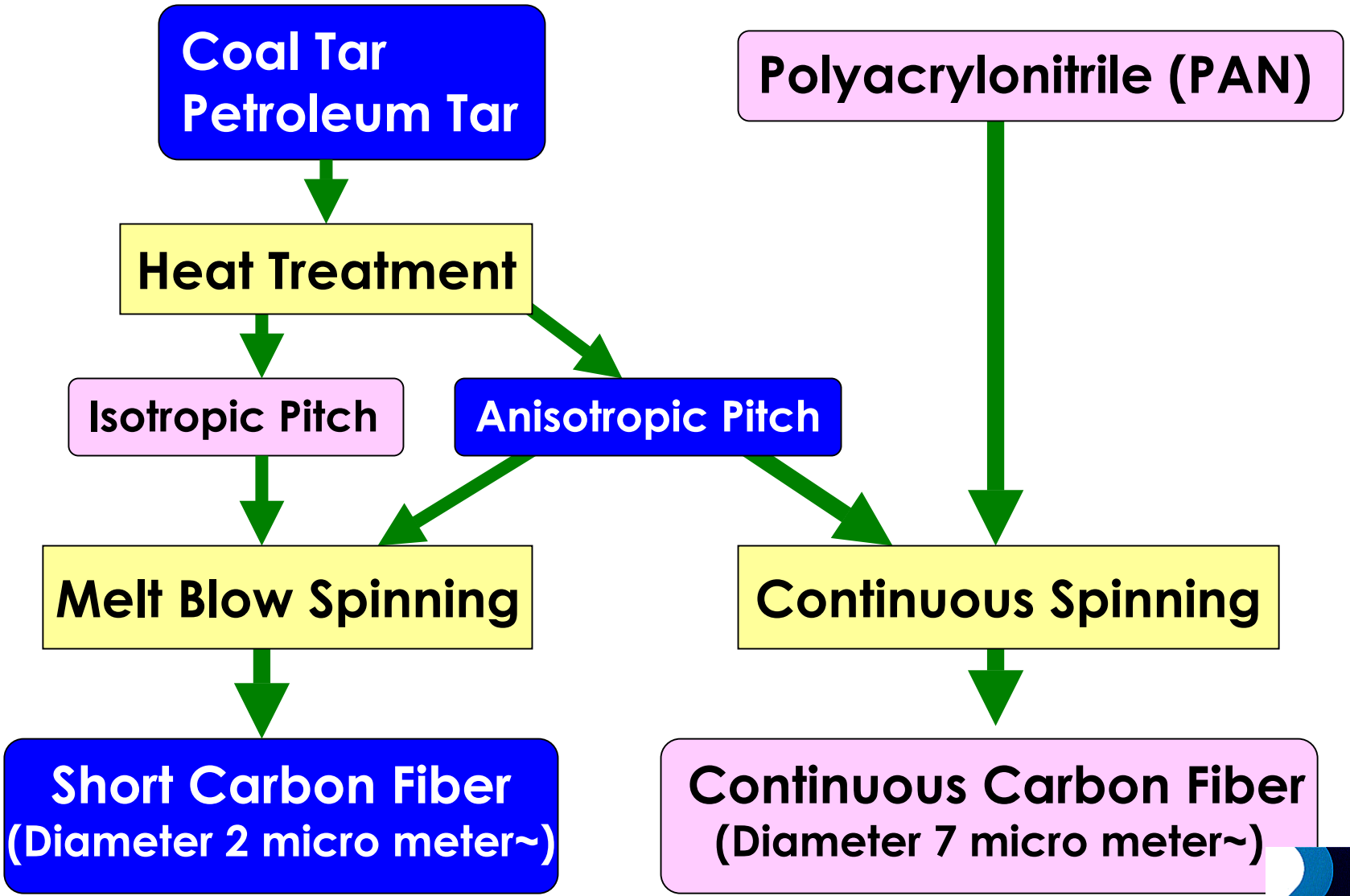
Fine Carbon Fiber Manufacturing Technology(1)

Development Points



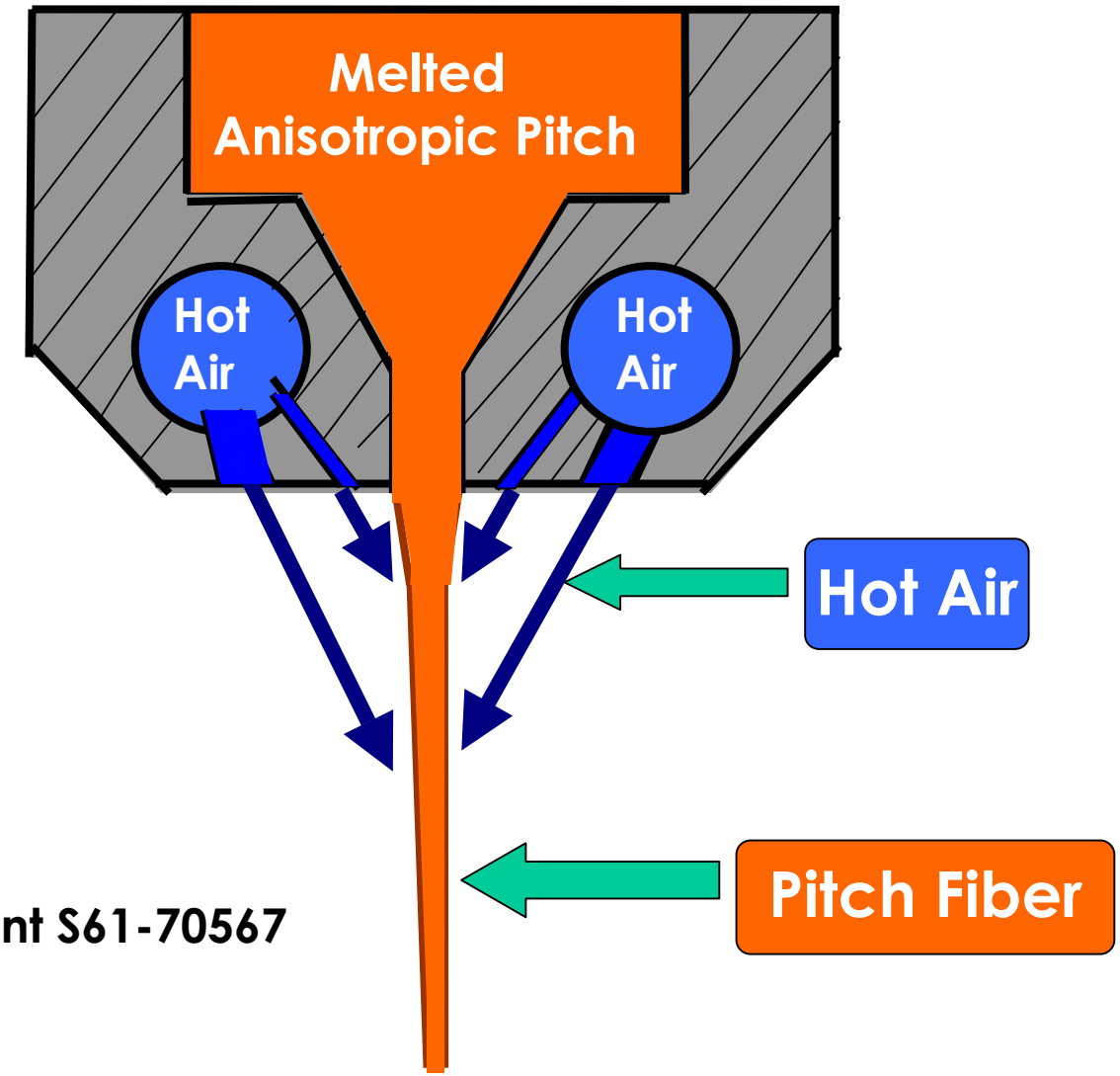
Fine Carbon Fiber Manufacturing Technology(2)

Raw Material of Carbon fiber



Fine Carbon Fiber Manufacturing Technology(3)

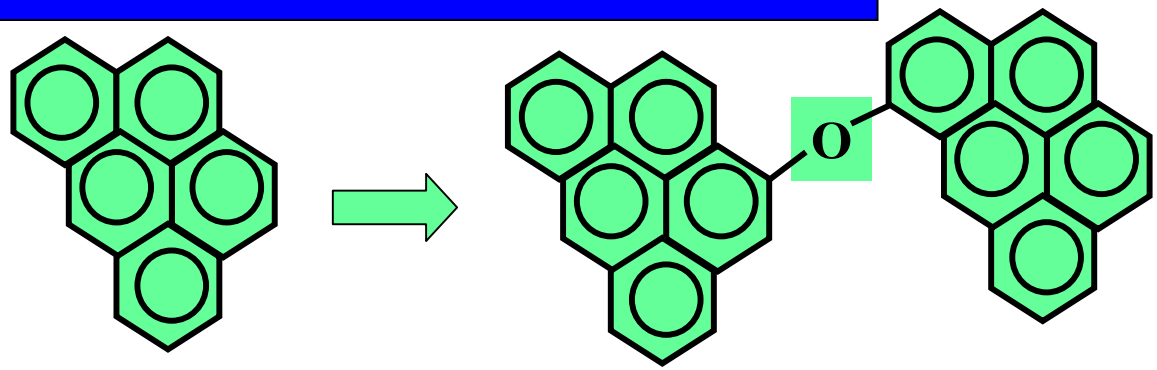
Spinning Method



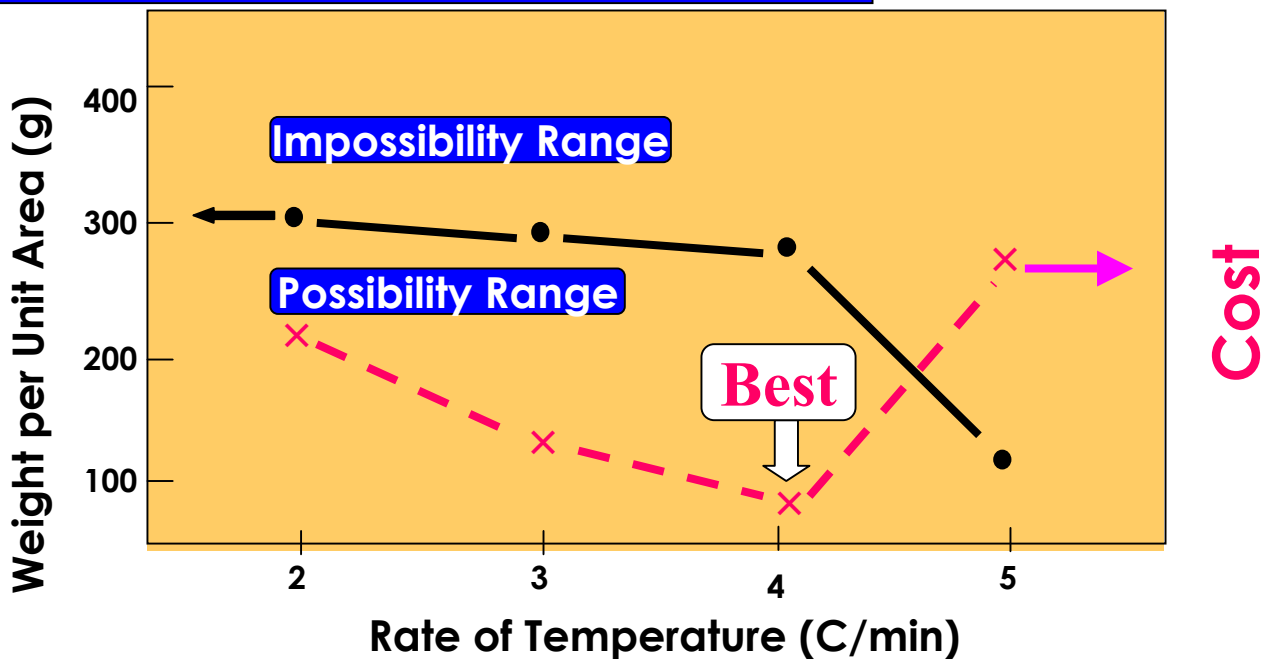
Japan Patent S61-70567

Fine Carbon Fiber Manufacturing Technology(4)

Mechanism of Infusible Treatment

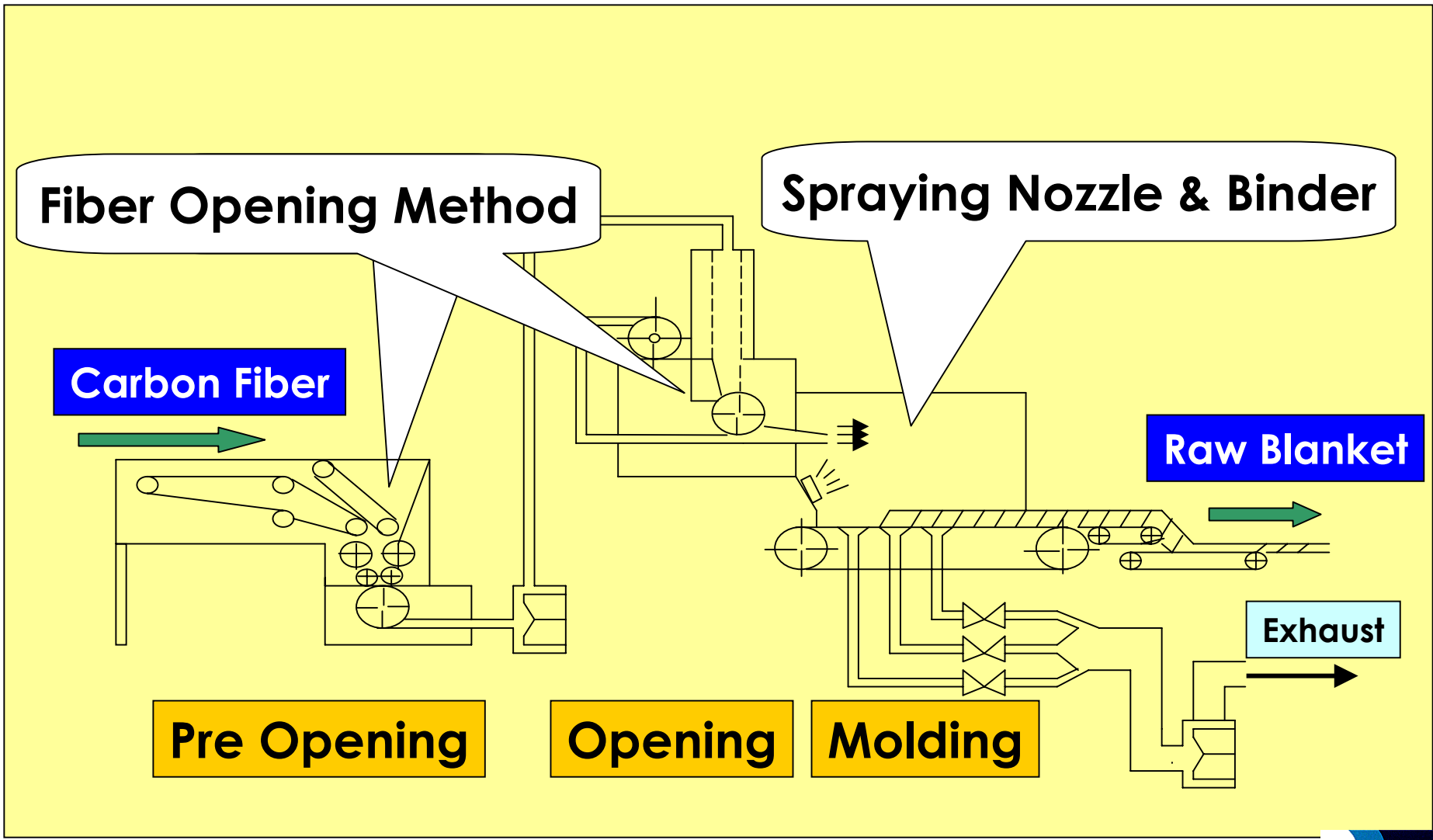


Suitable Infusible Treatment



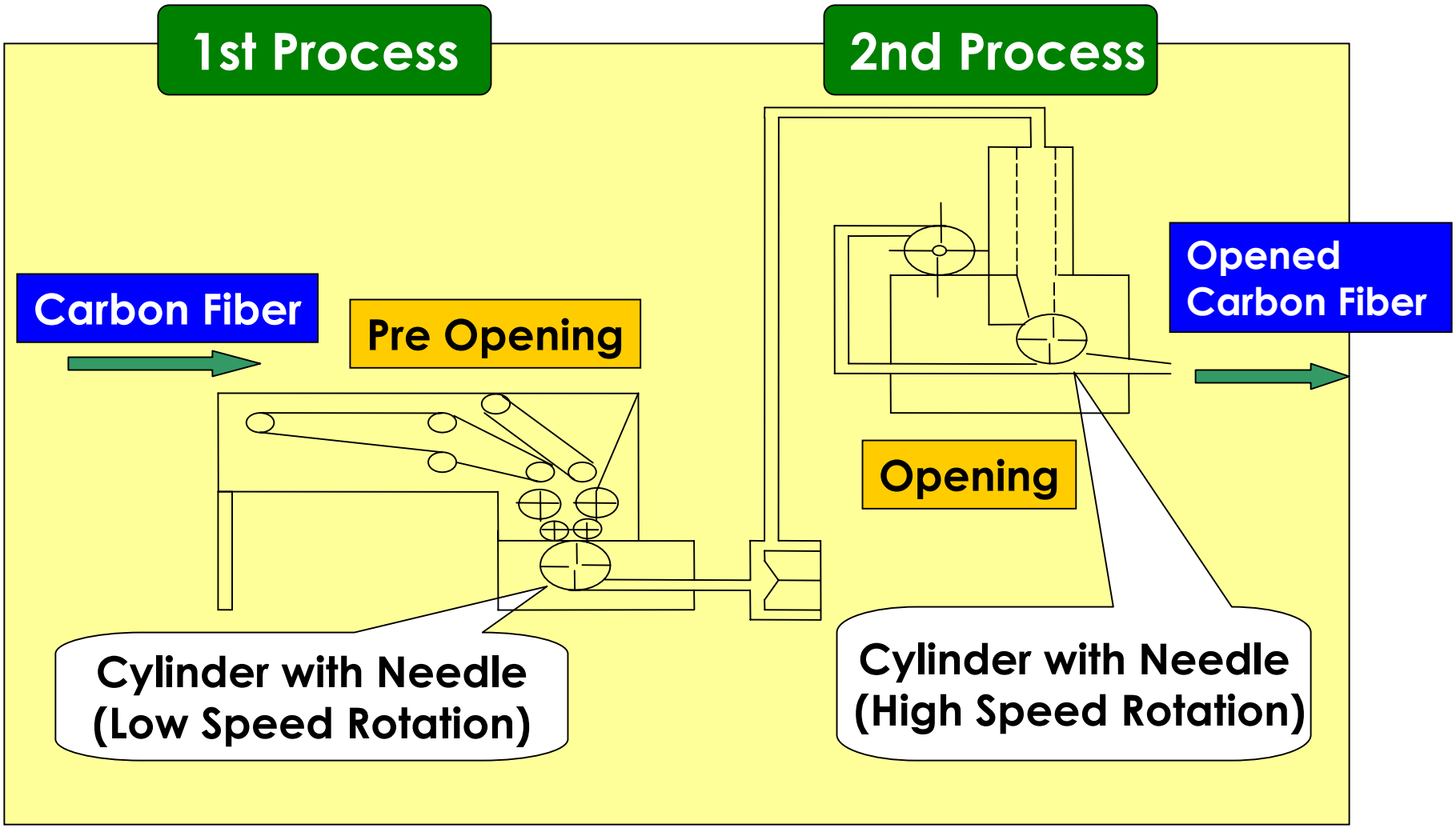
Fine Carbon Fiber Insulation Processing Technology(1)

Development Points



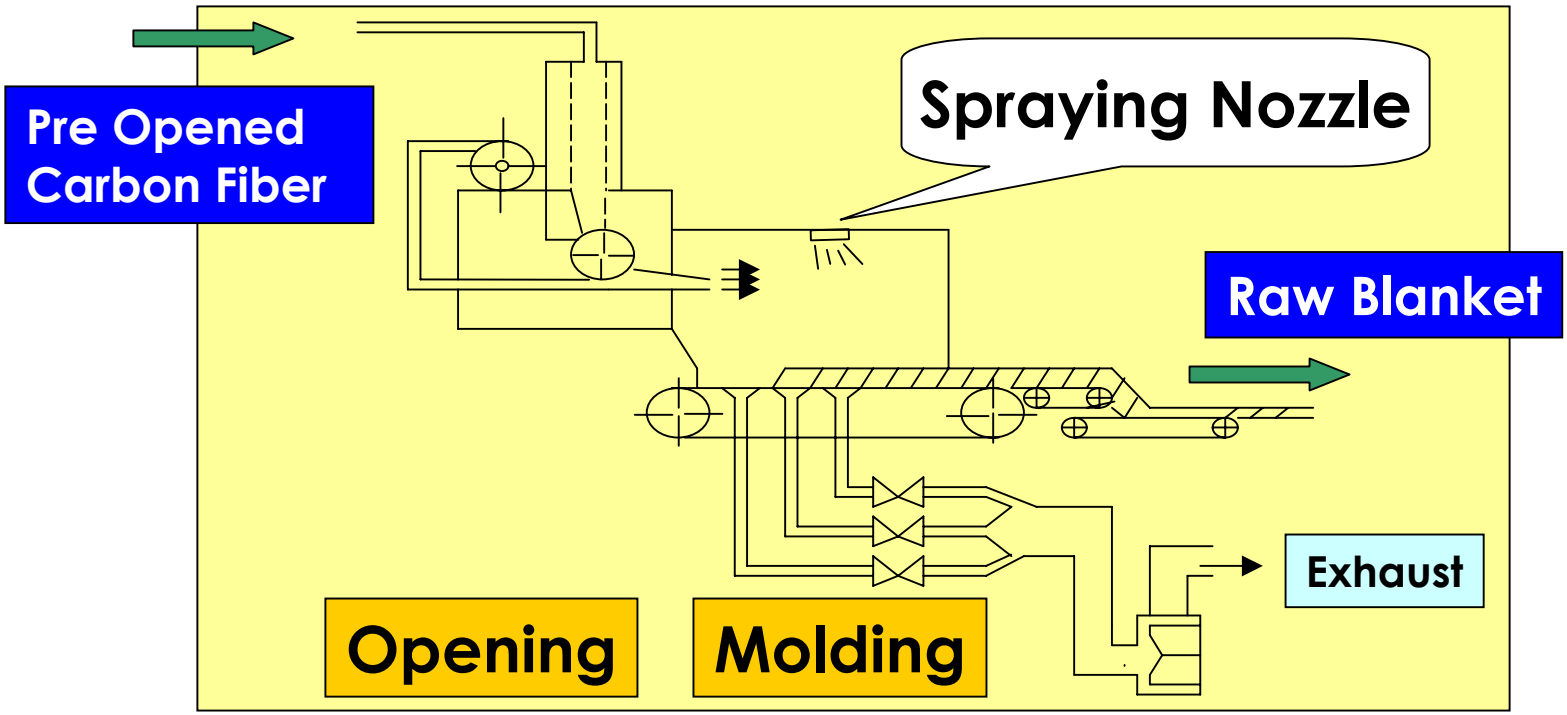
Fine Carbon Fiber Insulation Processing Technology(2)

Development of Carbon Fiber Opening Method



Fine Carbon Fiber Insulation Processing Technology(3)

Development of Spraying Nozzle



Development of Binder

*Phenol Resin
*Formalin Free
*No Corrosion
*Low Cost

Evaluation of Fine Carbon Fiber Insulation (1-1)

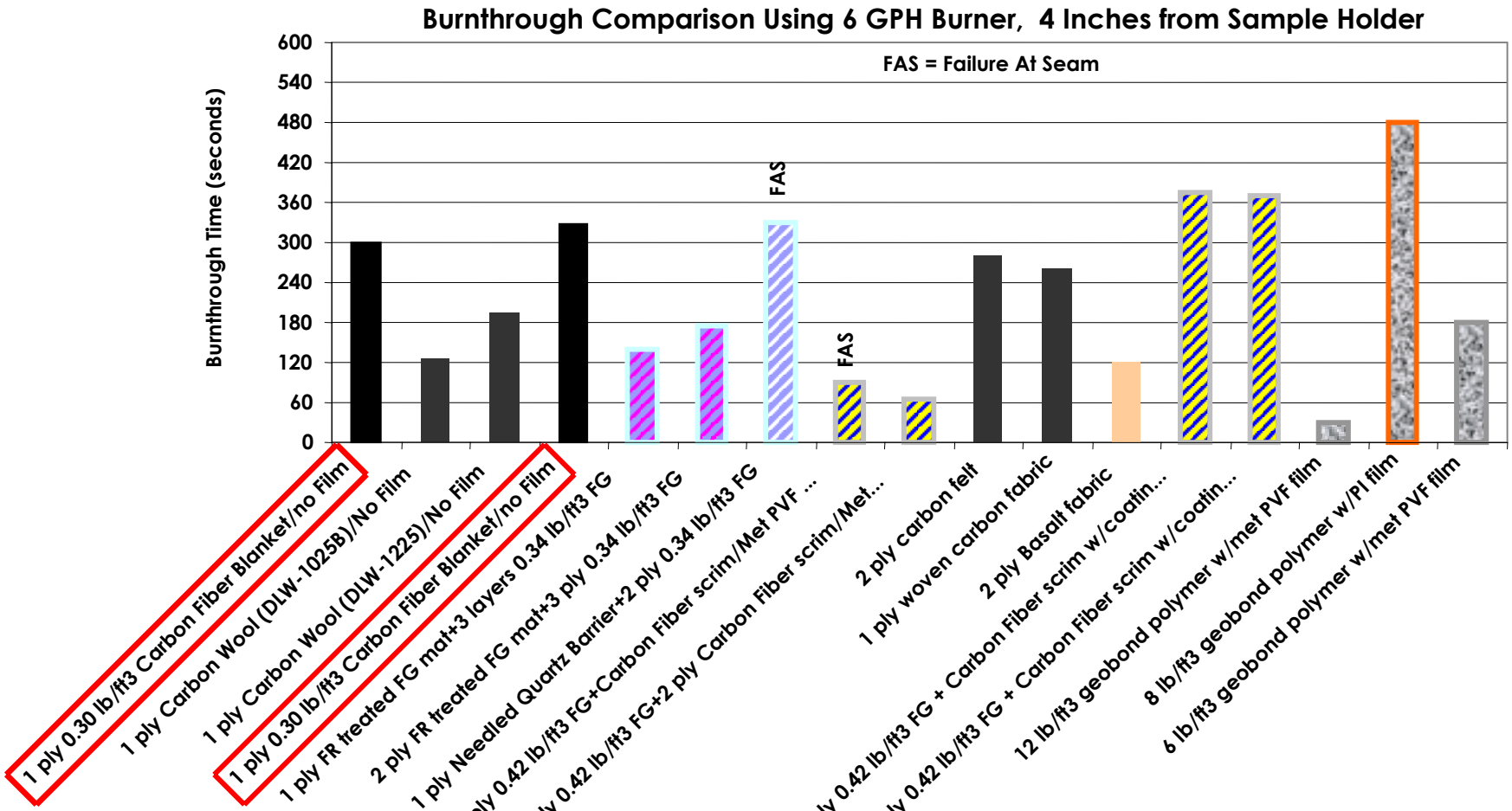
Burnthrough Test Standard

Proposed Burnthrough Test Standard

www.fire.tc.faa.gov/ppt/bt2.ppt (2nd Slide)

Evaluation of Fine Carbon Fiber Insulation (1-2)

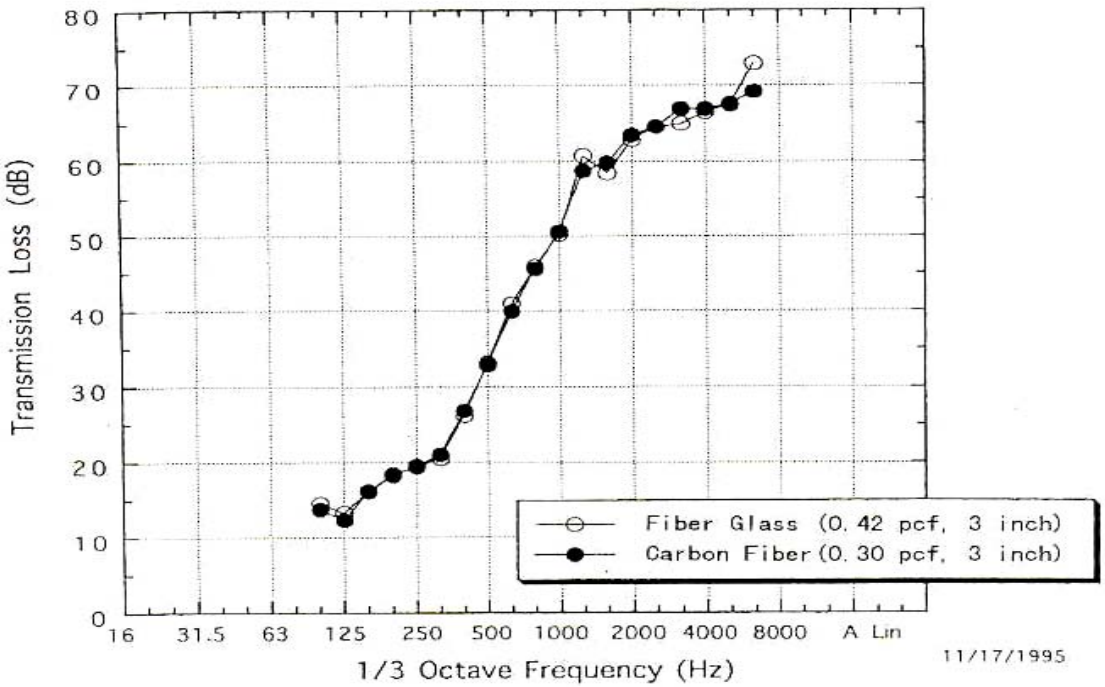
FAA Burnthrough Test (Feb.'99)



www.fire.tc.faa.gov/ppt/bt2.ppt (8th Slide)

Evaluation of Fine Carbon Fiber Insulation(2)

Acoustic Transmission Loss



Transmission Loss for fine carbon Fiber Insulation and Fiber Glass

Thermal Conductivity = 0.26 Btu-in/hr-sq,ft F

Evaluation of Fine Carbon Fiber Insulation(3)

Other Properties

ITEM	TEST RESU, lt
FLAMMABILITY	
SMOKE DENSITY	2 Ds
HEAT RELEASE	27 KW min/ sq,meter
EXIT TIME	0 sec
TOXIC GAS	
CO	150 ppm
NO_x	5 ppm
HCN,HF,HCI,SO_2	NOT DETECT

ITEM	TEST RESU, lt
WATER RETENTION	4 g/100in^2
MOISTURE ABSORP.	247 gr/100in^2
LOFT RETENTION	80 %
DURABILITY	1.65 lb/in^2
CORROSION	NO CORROSION
ELECTRIC COND.	80 ohm-inch

Health & Safety

Subchronic Inhalation Study

Purpose

The sign which causes chronic symptoms such as the tumor in the lung of the mouse is evaluated.

Method

The mouse is made to inhale the fine carbon fiber for 90 days, and pathological change of lung in 45th and 90th is observed afterwards.

Term

□about 1 year