Development of Aircraft thermal acoustic insulation

Aircraft thermal acoustic insulation requires fire resistant and lightweight characteristic along with thermal and acoustic as original required characteristic.
Osaka Gas has been developing the new pitch-based carbon fiber satisfying all requirements since 1992.
The target of this development is to make the diameter of carbon fiber less than 2um.
Carbon fiber is smaller in specific gravity than glass fiber presently adopted for insulation (Carbon fiber 1.6, glass fiber 2.3) and therefore characterizes lightweight.
But carbon fiber should be made smaller diameter (less than 2um hereunder called fine carbon fiber) equal to the diameter of glass fiber (about 1.5um to 2.0um) to maintain light weight after product.
At that time it was impossible to produce fine carbon fiber insulation at stable quality by using existing technology of carbon fiber.

Osaka Gas therefore applied the technology of existing product (diameter 13um to 18um) and finally succeeded in developing the new manufacturing technology of fine carbon fiber first in the world.
Also there was no processing technology for insulation by fine carbon fiber, but Osaka Gas also developed the method.
Osaka Gas will report the development for fine carbon manufacturing technology and processing technology of insulation as mentioned below;

1. fine carbon fiber manufacturing technology
   - ✍✍selection of low material carbon fiber pitch
   - ✍✍development of spinning nozzle for fine carbon fiber
   - ✍✍study of heat treatment condition
2. Insulation processing technology
   - ✍✍development of opening_method of fine carbon fiber
   - ✍✍development of binder and spray nozzle

Osaka Gas will report the data of thermal, acoustic and fire resistant based on the test.
Also Osaka Gas will introduce the Health & Safety test (now proceeding) in order to confirm the safety of fine carbon fiber (less than 2um) for human being.