

# **X-RAY TOMOGRAPHY IMAGING OF SANDWICH PANELS MADE OF RAMIE FIBRE AND CARBON FIBRE**

08/11/2018

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# 1. Background



- Lighter
- Similar Strength
- Multifunctional



**Traditional Materials:**  
Steel, Aluminium, Titanium

**State of Art Materials:**  
Carbon/Glass Fibre  
Reinforced Polymers  
(CFRP)/(GFRP)

# 1. Background



**State of Art Application:**  
Boeing 787 Dream Liner

## Disadvantages:

- Environmental Unfriendly
- Non – recyclable
- Non – biodegradable



Natural Fibre



## Challenges:

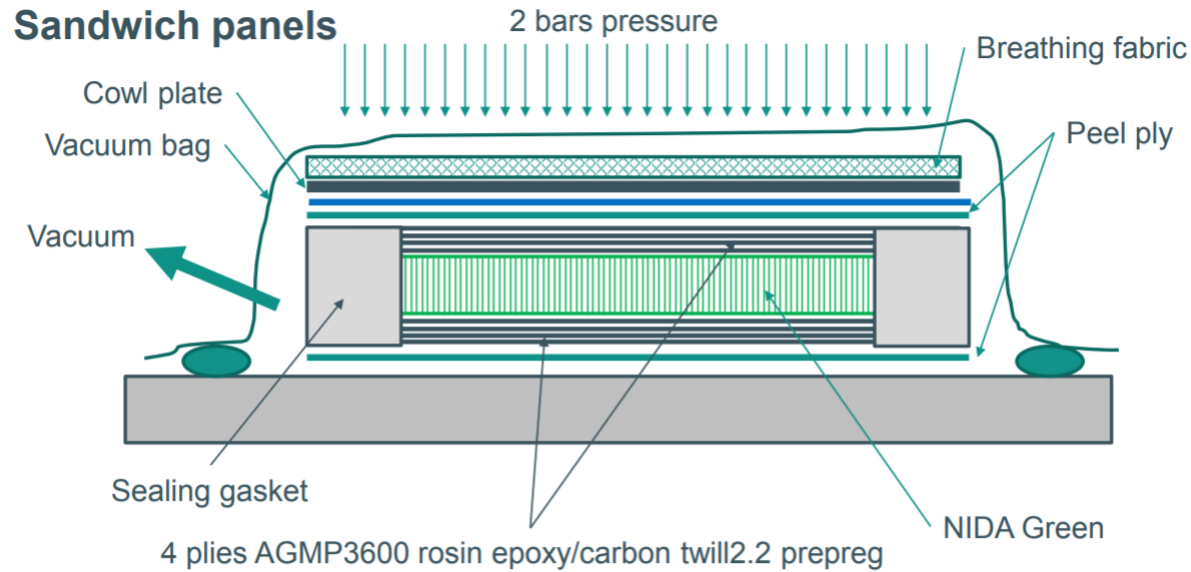
- Insufficient strength
- Incompatible with matrix
- Poor heat resistance
- Moisture Absorption
- Porosity
- Kinks

## 2. Material

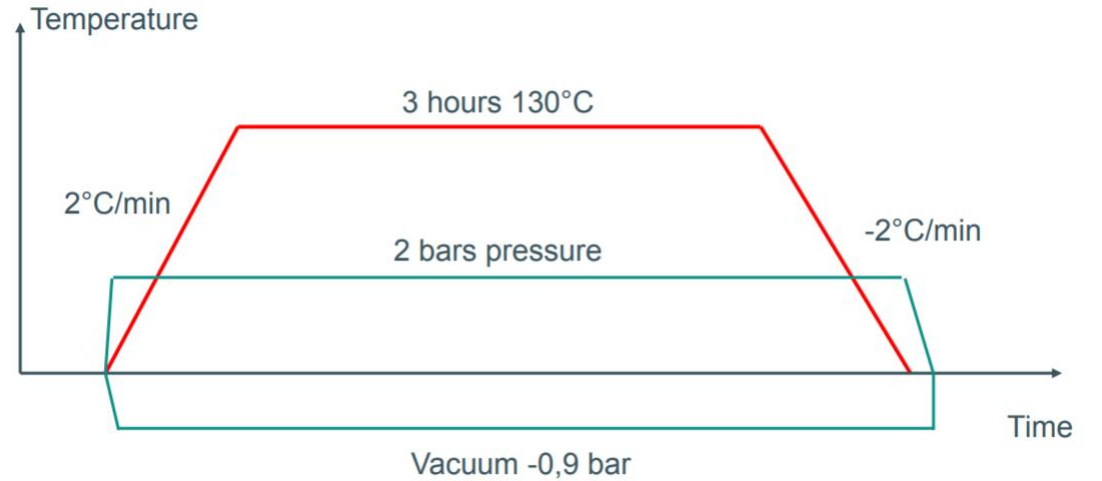


- Ramie fibre/epoxy prepreg
- Carbon fibre/epoxy prepreg
- Honeycomb core made of mixed fibre (partly natural sourced)

# 3. Manufacturing Process



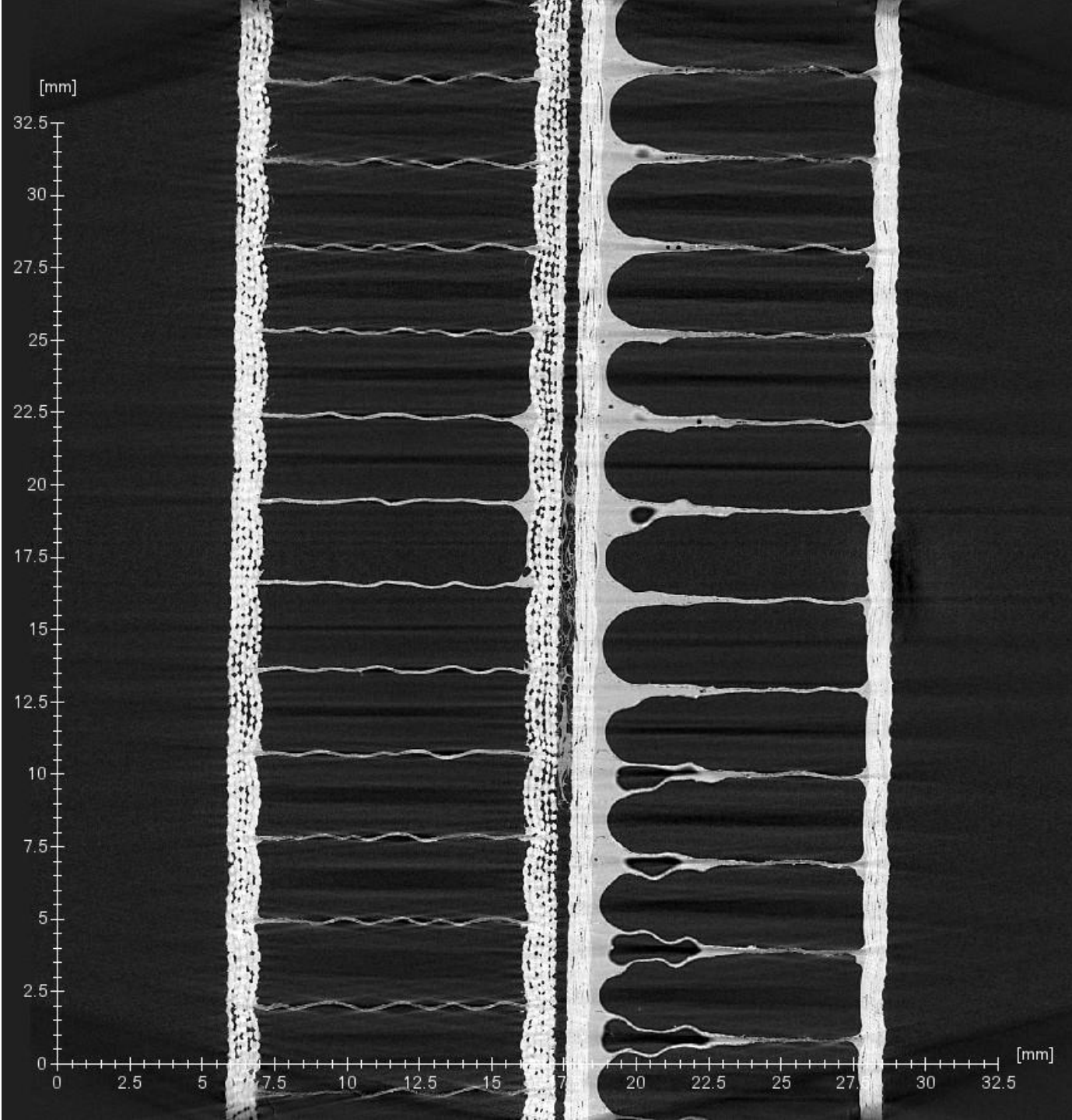
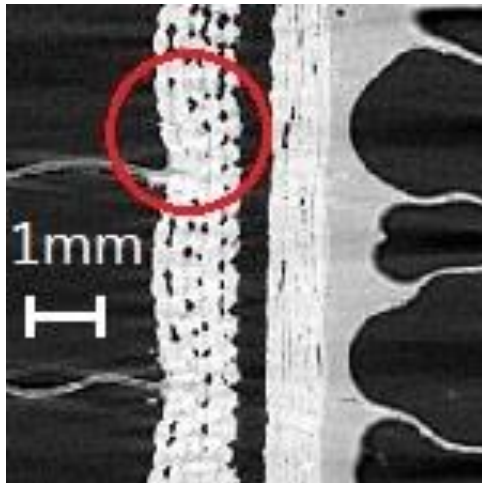
**Sandwich panels Curing cycle**



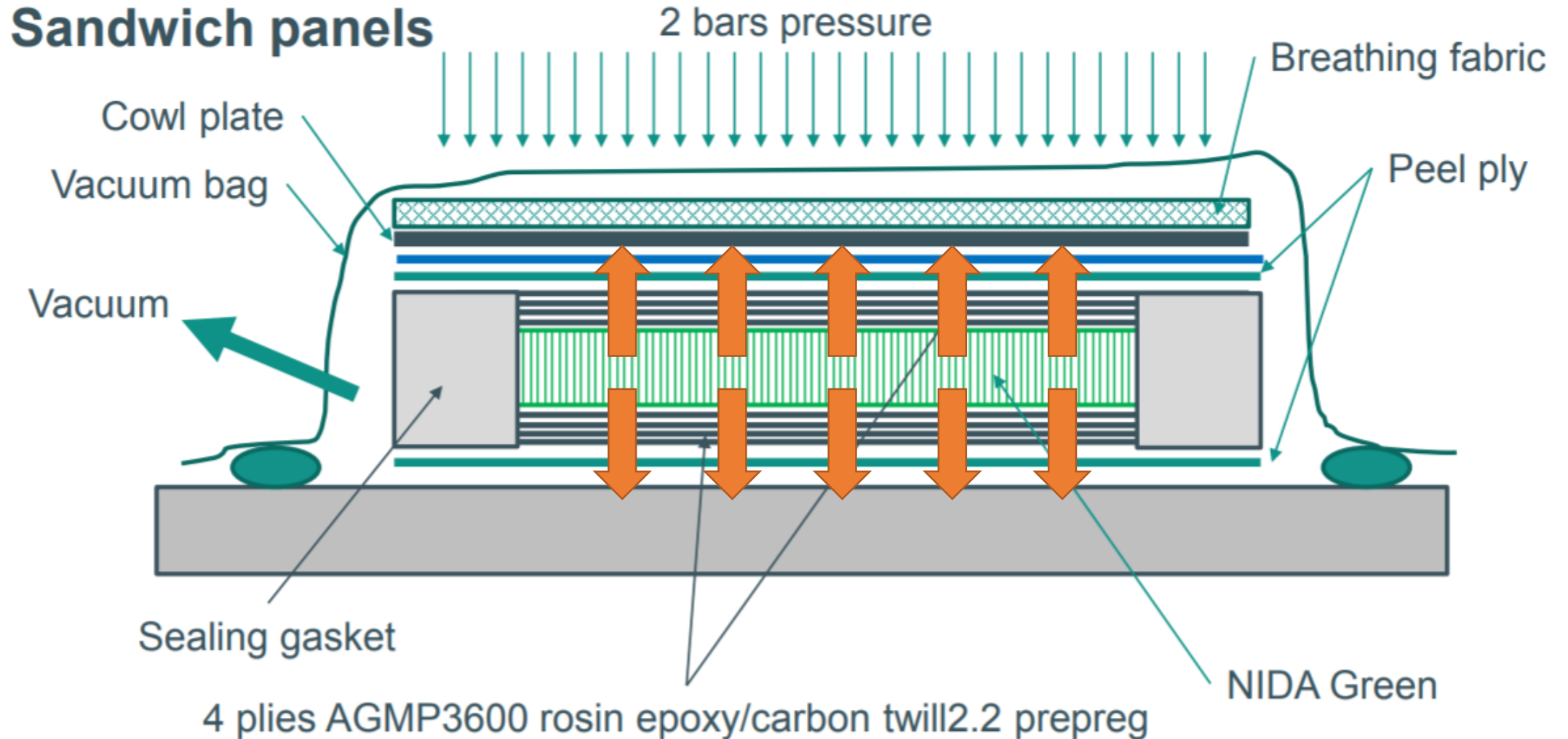
## 3. Result

### Main Features:

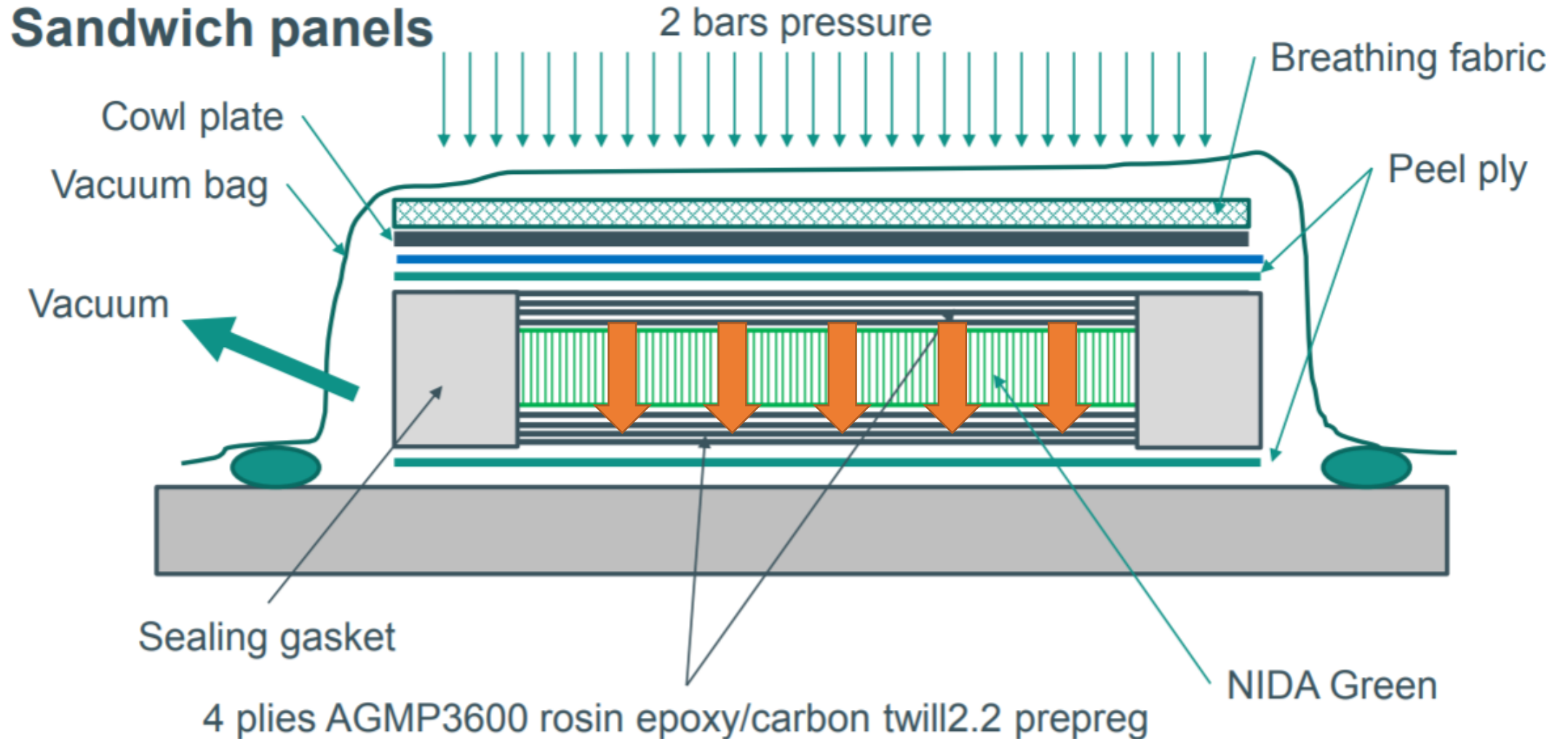
- Position of epoxy
- Distribution of epoxy
- Shape of prepreg



# 5. Discussion – Effect of Vacuum

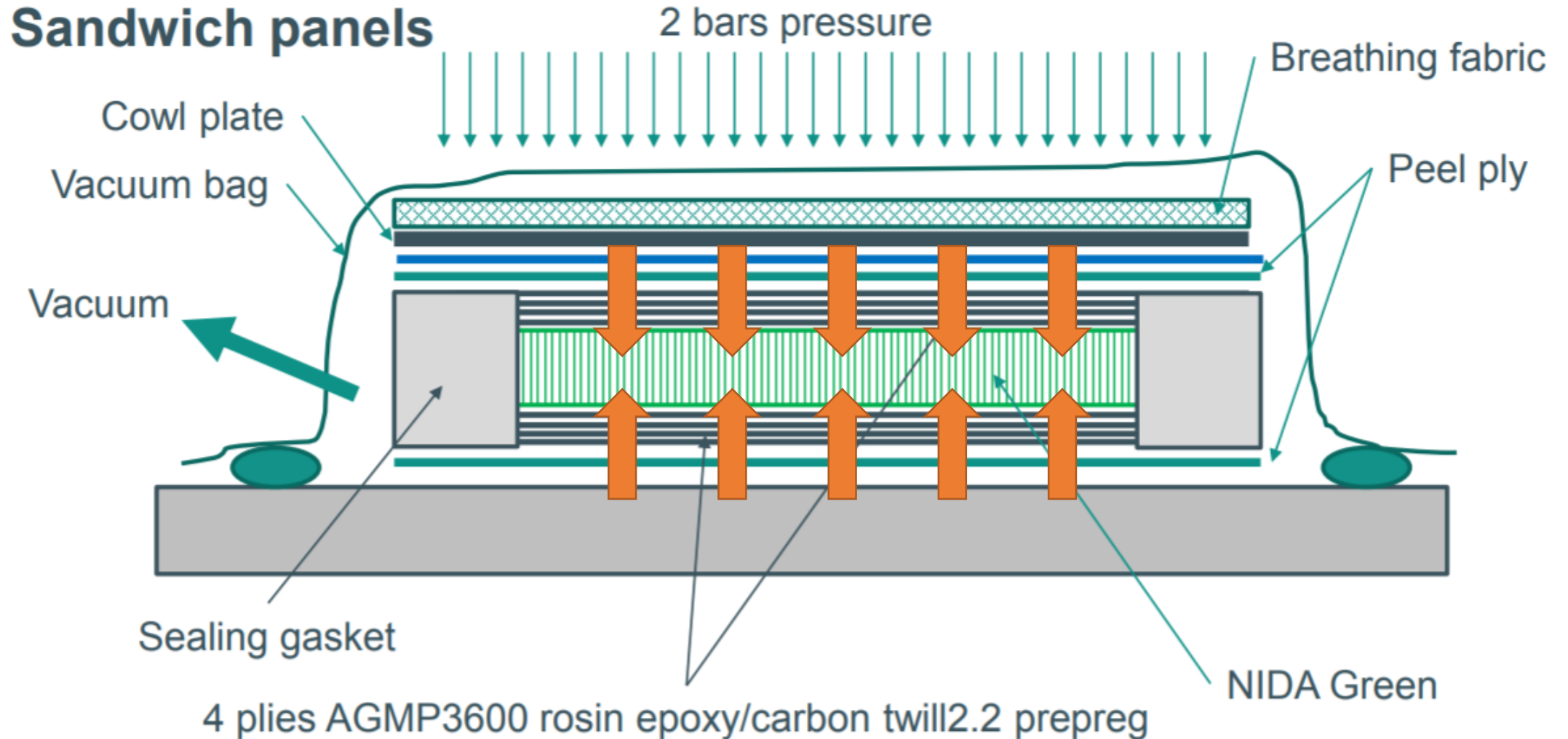


# 5. Discussion – Effect of Gravity





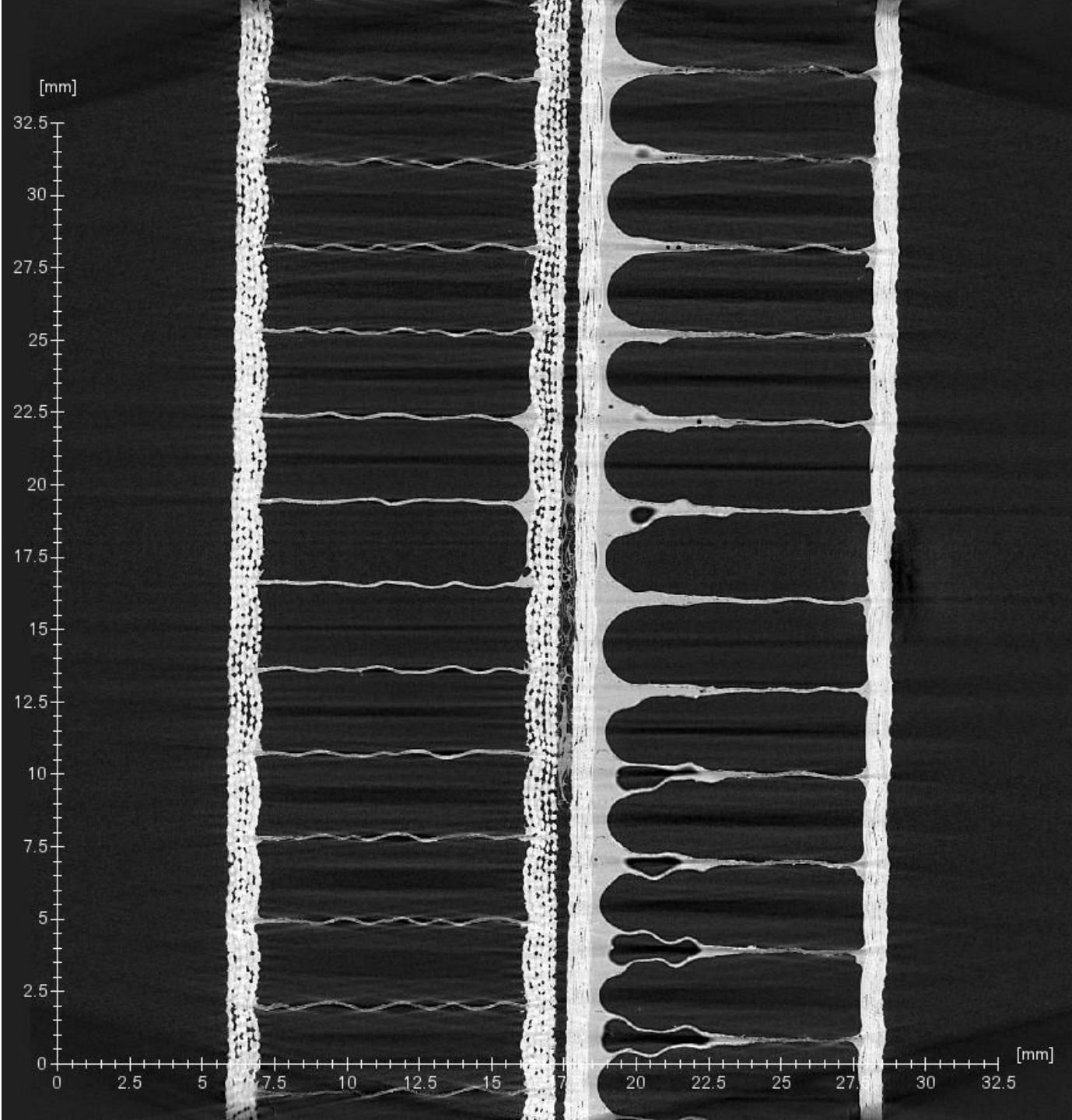
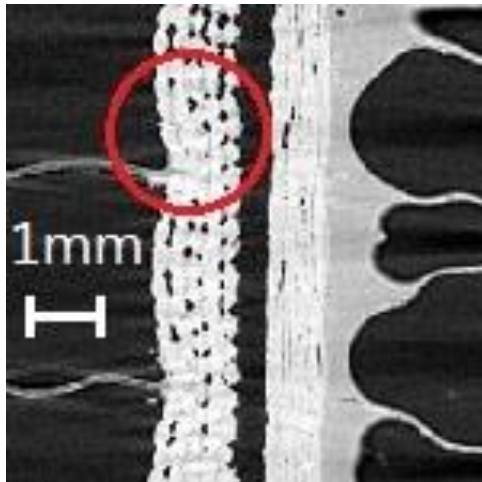
# 5. Discussion – Effect of Air Pressure



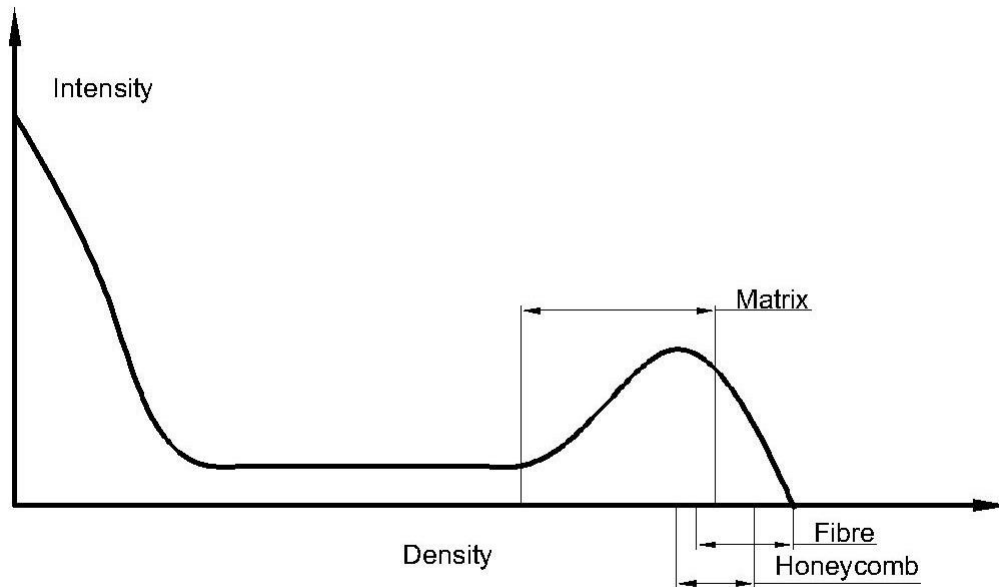
## 6. Conclusion

### Main Features:

- Position of epoxy – Vacuum
- Distribution of epoxy – Gravity
- Shape of prepreg – Air Pressure



# 7. Future Work



## Challenges:

- Similar density/attenuation
- Poor phase-contrast
- Difficult to segment

## Future Work:

- Synchrotron light
- Phase-contrast X-ray imaging

**Thanks for your attention**

**This project has received funding from the European Union's  
Horizon 2020 research and innovation programme  
under grant agreement No 690638.**

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