



HISTORY OF COMPOSITES

GROUP

BIRTH OF THE “PLASTICS ERA”

- The modern era of composites began when scientists developed plastics. Until then, natural resins derived from plants and animals were the only source of glues and binders. In the early 1900s, plastics such as vinyl, polystyrene, phenolic, and polyester were developed. These new synthetic materials outperformed single resins derived from nature.
- However, plastics alone could not provide enough strength for some structural applications. Reinforcement was needed to provide additional strength and rigidity.
- In 1935, Owens Corning introduced the first glass fiber, fiberglass. Fiberglass, when combined with a plastic polymer created an incredibly strong structure that is also lightweight. This is the beginning of the Fiber Reinforced Polymers (FRP) industry.

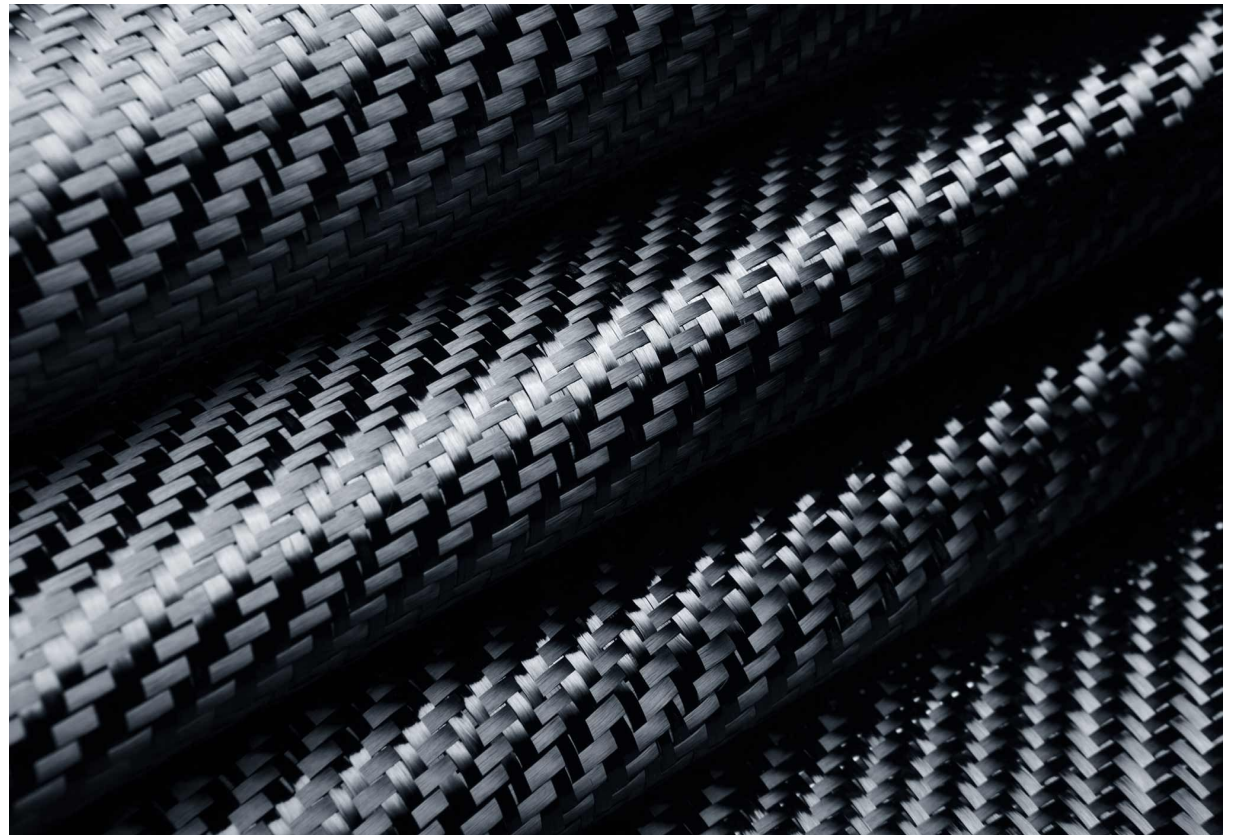


WWII – DRIVING EARLY COMPOSITES INNOVATION

- Many of the greatest advancements in composites were the result of wartime needs. Just as the Mongols developed the composite bow, World War II brought the FRP industry from the laboratory into actual production.
- Alternative materials were needed for lightweight applications in military aircraft. Engineers soon realized other benefits of composites beyond being lightweight and strong. It was discovered, for example, that fiberglass composites were transparent to radio frequencies, and the material was soon adapted for use in sheltering electronic radar equipment (Radomes).

CONTINUED ADVANCEMENT IN COMPOSITES

- In the 1970s the composites industry began to mature. Better plastic resins and improved reinforcing fibers were developed. DuPont developed an aramid fiber known as Kevlar, which has become the product of choice in body armor due to its high tensile strength, high density, and lightweight. Carbon fiber was also developed around this time; increasingly, it has replaced parts formerly made of steel.
- The composites industry is still evolving, with much of the growth now focused around renewable energy. Wind turbine blades, especially, are constantly pushing the limits on size and require advanced composite materials.



LOOKING FORWARD

- Composite materials research continues. Areas of particular interest are nanomaterials — materials with extremely small molecular structures — and bio-based polymers.

