Take Risk Out…Put *Advantex*® Glass In

OWENS CORNING®
INNOVATIONS FOR LIVING™

CASE STUDY

Massive Decking for Coal Gas Bubble Jet Reactors – Made with Advantex® Glass

Wet scrubbers remove vast quantities of sulfur dioxide (SO_2) from the exhaust of coal-fired power plants by mixing the flue gasses with water and limestone. Inside the large circular jet bubble reactor is an unrelenting combination of sandstorm and acid-laced tsunami creating a corrosive environment. Keeping this storm separated and under control is the job of decking, which divides the immense vessels into three sections, each with a slightly different chemistry, temperature, and pressure (Fig. 1).

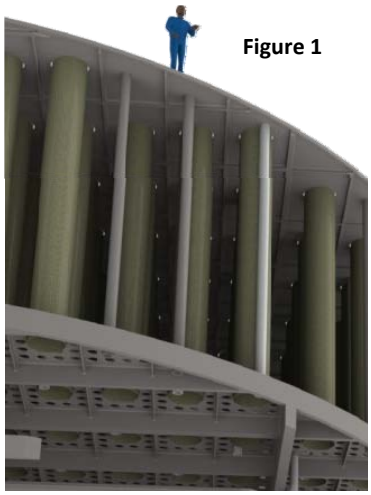


Figure 1

The decks that separate the sections must bear abrasion, corrosive chemistry, sediment buildup, and thermal stresses. FRP (fiberglass-reinforced polymer) is a natural corrosion-resistant solution, but the scale of the challenge demanded construction of FRP floors more than 1 inch thick and stiffened by ribs several inches thick. RPS Composites, Inc. responded to this challenge by creating massive composite panels made with Owens Corning's™ Advantex® glass fiber reinforcement by vacuum infusion (Fig. 2). Advantex® glass is a patented boron-free glass formulation that is a corrosion-resistant E-CR glass fiber reinforcement meeting ASTM Standard D 578 and demonstrating proven performance in the field for more than 15 years. It also offers increased mechanical properties compared to standard E-glass and E-CR glasses.


Figure 2

The largest of these panels is roughly 15 feet x 25 feet (Fig. 3). Ribs integrated into the panels are more than 15 inches tall and 4 inches thick. RPS Composites overcame several barriers to produce these panels. Just placing hundreds of pieces of thin, fluffy fabrics into the mold would alone have been daunting and infusing resin through all of the glass fiber nearly impossible.


Figure 3


Figure 4

However, RPS Composites combined specialized designs for vacuum infusion with extremely scaled up 3D woven fabrics made with Owens Corning™ corrosion-resistant Advantex® glass reinforcements. 3TEX Inc. then used unique 3D weaving machines to assemble thousands of Advantex® glass direct rovings into both 5-mm-thick rollable fabrics and ¾-inch-thick slab-like UniGirder industrial scale uniaxial preforms for the ribs. The rollable 3D fabrics (Fig. 4) allowed very broad and 1.5-inch-thick panels to be laid in just 5 plies, whereas the massive ribs required just 4-6 plies of the slab-like UniGirder each. The enormous parts in fact required very few cut parts. As the fabrics were designed to flow resin more easily, the infusion of the parts went from almost impossible to very challenging.

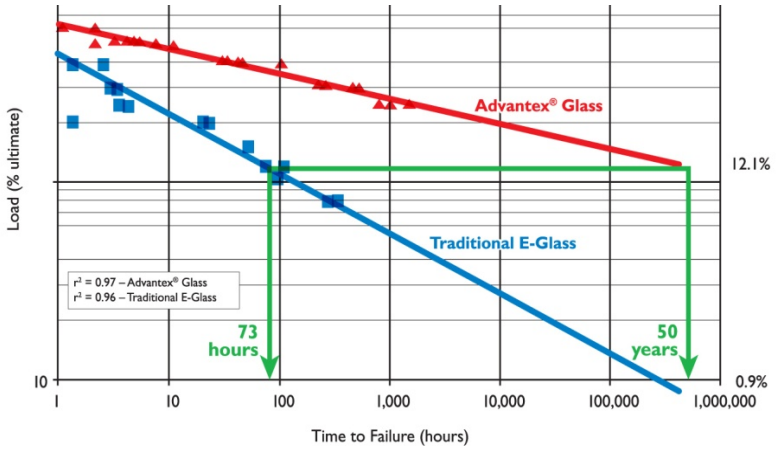
CASE STUDY

Specify Advantex® Glass for all FRP used in Corrosive Environments.

With innovative infusion methods and industrial scaled reinforcements, composites are now entering an entirely new realm of scale reserved in the past for metals and concrete. With corrosion-resistant glass fabrics now approaching 4 inches thick, the future will certainly bring even larger composite structures.

STRESS RUPTURE OF COMPOSITE RODS IN NORMAL ACIDS (HCl-H_2SO_4)

Advantex® glass offers a useful stress 12 times that of a laminate made with traditional E-Glass in acid applications. Another way of looking at the performance differences is by noting that the traditional E-glass laminate would fail in approximately four days when stressed at the 50-year stress limit for the Advantex® laminate while exposed to a 10% hydrochloric acid environment.



In acidic environments, Advantex® glass performs 12 times that of a laminate made with E-glass.

Take Risk Out…Put *Advantex®* Glass In.

Owens Corning Customer Contacts:

- **RPS Composites:** http://rpscomposites.com, Sales/Support: 800-343-9355 or ktownsend@rpscomposites.com
- **3TEX Inc:** http://www.3tex.com, Sales/Support: 252-717-9461 or wigentd@3tex.com

Owens Corning Advantex® Corrosion-Resistant Glass Fiber Reinforcements:

Email: Advantex.americas@owenscorning.com; Advantex.europe@owenscorning.com; Advantex.asiap@owenscorning.com

For more information call: (614) 777-1384

OWENS CORNING
COMPOSITE MATERIALS, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OHIO 43659
1.800.GET.PINK™
www.owenscorning.com
www.ocvreinforcements.com

EUROPEAN OWENS CORNING
FIBERGLAS, SPRL
166, CHAUSSÉE DE LA HULPE
B-1170 BRUSSELS
BELGIUM
+32.2.674.82.11

OWENS CORNING COMPOSITE SOLUTIONS BUSINESS
ASIA PACIFIC REGIONAL HEADQUARTERS
UNIT 01, 02, 05, 39/F, PUDONG KERRY PARKSIDE,
1155 FANG DIAN ROAD, PUDONG, SHANGHAI
201204, CHINA
+86.21.6101 9666