



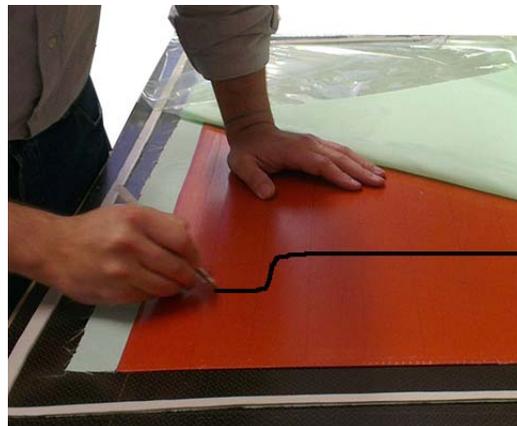
Innovative Heating Blanket To Be Cut In The Field To Fit Specific Dimensions and Geometry.

INTRODUCTION & OBJECTIVES Appropriate curing of the patch resin and the adhesive layer is an essential step to secure the integrity and the sound mechanical performance of a bonded composite repair. Today, the required elevation of temperature is usually achieved by means of a resistance heating blanket, which conduct heat to the repair area, regulated through closed loop temperature control, using spot temperature measurements. Heating Blankets for Composite Repair are presently designed by GMI Aero to fulfill a large range of cases in terms of geometry, shapes and temperature levels. The techniques of fabrication is based on encapsulating NiCr wires between two silicone sheets to ensure electrical isolation. on routing NiCr wires on silicone sheet. The encapsulation between two silicone layers assure electrical isolation. Even if this method is rather «simple» and allows to offer products that present excellent performances, technicians of MROs and Airlines are always frustrated not to have the possibility to manufacture in the field a product that can be tailored to the dimensions of the patch. The answer to our customers request is the **Conductor** Technology, which has been developed, in the frame of a **Cleansky** project.¹

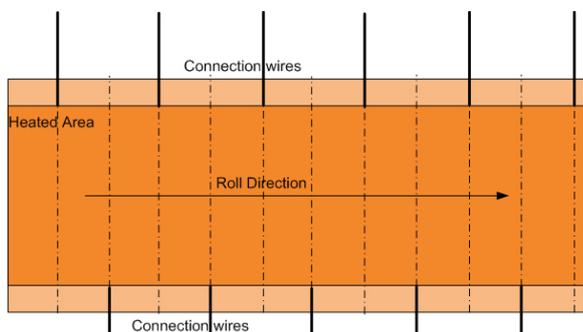
CONDUCTOR TECHNOLOGY With this innovation, GMI Aero brings to our customers a very promising product that will improve the quality of bonding operations and productivity by totally suppressing the lead time for heating element fabrication.

The product appears for the user as a standard silicone blanket that integrates a mesh of specially coated fibers. These fibers conduct electrical power in a distributed way over the whole surface of the blanket thus gaining in homogeneity.

Furthermore, the special weaving of the fibers allows for cutting the blanket in different shapes whenever there is the need to follow contours that inhibit the use of a standard rectangular heating blanket. Power wires installed at pre-defined spots allow easy connection for power supply. The connectors for the power delivery wires have been specially selected to be easily mounted with maximum safety.



The operator sketches a cutting line on the blanket



1. Collaborative **Cleansky** Project, in partnership with **NTUA** (Athens, Greece), under the supervision of **Airbus Group Innovation**

CONDUCTOR - Heating Mat To Be Cut In The Field

BENEFITS FOR THE USER

- a) This innovation delivers to the final user the benefits of having a "customised for the application" heating blanket manufactured **in place**, rather than having to order a special circuit, resulting in the total suppression of lead time for the procurement of heating blankets,
- b) High versatility in the design of geometrical patterns (see illustration below); the user is able to adapt the shape of the blanket to a special geometry in order to distribute heat where it is strictly necessary, thus improving the heat management process. **Conductor** is the answer, in the context of repairing new advanced composite structures, to the search for tailored-made heating blankets adapted to the thermal signature of the part,
- c) The fitting to the geometry of the repair area leads to the minimization of risk to overheat areas outside the repair zone,
- d) Prepared blankets could be further cut in smaller shapes if required,
- e) High homogeneity in temperature. The heating circuit develops heat with high quality of homogeneity in terms of temperature distribution,
- f) Conductor is compatible with the GMI Aero family of bonding consoles for temperature and power control,
- g) The Conductor technology allows also to apply for Multi Zone Heating solution (several blankets to cover a large area) and thus can be implemented with GMI-Anita Bonding with 2, 4, 6 zones,...
- h) Consult us for Combination with our solution [AdaptHeat for Fuselage Stringer Reinforced Panel Repairs](#)



Left: Conductor Matrix Circuit After Cut; central: heating circuit in test; right: Thermal image

Please consult us for more information

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