



GMI
AERO

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COMPOSITE REPAIR

INNOVATION FOR MROs & OEMs

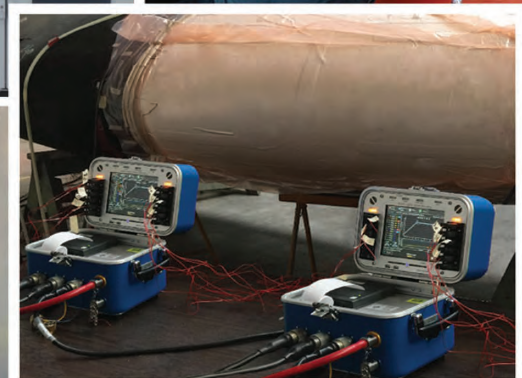
RESEARCH - TECHNOLOGY - TRAINING

**Bonding
Consoles**

Tooling

**Heating
Blankets**

Training



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GMI
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(1) ANITA BONDING CONSOLE SERIES

The **ANITA** Bonding and Heat Controller Series cover a wide range of needs as expressed by MROs and Aircraft part constructors.

It benefits of all long time established knowledge of the company in composite repair and fabrication.

They are selected by constructors like **Airbus, Dassault Aviation, Bombardier, Boeing**, or MROs like **Nordam, Goodrich, SIAEC, HAECO, AIR FRANCE Industries,...**

The repair model family offers both capabilities for **workshop** use as well as for **flight line** operations.

They integrate sophisticated software and electronics, however remain **very simple** for the operator to use through **tactile screen** with implicit dialogues.

For quality control, **USB** key data transfer and innovative pdf automatic **data reporting** are available.

Several models are now available with **1, 2, 4, 6 or 18 heating zones** according to the nature of part to be repaired.



1 THE ANITA FAMILY

Standard Workshop Version

Flight Line Version

Version 2 ZONES

- Type NG
- Type EZ Workshop
- Type EZH Flight Line (ATEX)



Version 1 ZONE

- Type QS1Z Workshop
- Type QSH Flight Line (ATEX)



Anita **RAPID**: for Quick Jobs as a Heat Controllers

Push button console

Operations from 1 to 3 different zones



Version 4 ZONES

- 4 Heating Zones (simultaneously or independently controlled)

- Large repairs
- Radome application



Version 6 ZONES

- 6 Heating Zones (simultaneously or independently controlled)

- Large repairs
- Reverser repairs : Transcowls & Corecowls



2 THE WORKSHOP ANITA MODELS

2.1 ANITA NG9201 - 1 REPAIR WITH 1 OR 2 ZONES

| Item | P/N | Description |
|------|-----------|--|
| 2101 | GMING9201 | <p>Bonding Console 2 zones - Anita NG</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 2 zones for 1 advanced repair. - 6 thermocouples (J or K) - Printer - Vacuum venturi pump mounted - Sensing of vacuum bag - Immediate programming to run intuitive procedures - Very robust for field operation <ul style="list-style-type: none"> - Dimensions: 350 x 220 x 220 mm - Weight 9 Kg - Total Power 6000 Watts - Anitalk PC software for supervision and data logging and reporting - Delivered complete with its accessory case |



Consumable for printer

| | | |
|------|--------------|---|
| 2102 | GMIOTI010-01 | A box of 20 paper rolls for Anita printer |
| 2103 | GMIOTI010-02 | A box of 10 ink ribbons for Anita printer |

2.2 ANITA EZ0901 - 2 REPAIRS - 2 ZONES

| Item | P/N | Description |
|------|----------------|---|
| 2201 | GMIEZ0901 | <p>Bonding Console 2 zones - Anita EZ</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 2 zones : controlled simultaneously OR independently - Touch Screen - 12 thermocouples (J or K) - Printer - Easy programming - Quick set to run - Automatic reporting of curing cycles - USB port to save reports of curing cycles - Automatic adaptation to 120V/230V environment - Delivered complete with its accessory case |
| 2202 | GMIEZAC0901-V* | <p>Accessory case delivered together with the Anita console as above;</p> <p>Contains : electrical cables, hoses, valves, vacuum hoses, thermocouples.</p> |



Consumable for printer

| | | |
|------|--------------|---|
| 2203 | GMIOTI010-01 | A box of 20 paper rolls for Anita printer |
| 2204 | GMIOTI010-02 | A box of 10 ink ribbons for Anita printer |

For the vacuum generation of the Anita EZ, one can use an electrical pump or a compressed air venturi pump as below. For electrical pump see the specific chapter.

| | | |
|------|-------------|--|
| 2205 | GMIOTPVV010 | <p>Venturi Pump on Valve - European connector</p> <p>Vacuum bag valve with a venturi pump mounted. This set can easily be mounted on a vacuum bag. Excellent flow.</p> <p>Model with European connection for compressed air Staubli (RBE06)</p> |
| 2206 | GMIOTPVV011 | <p>Venturi Pump on Valve - US connector</p> <p>Vacuum bag valve with a venturi pump mounted. This set can easily be mounted on a vacuum bag. Excellent flow.</p> <p>Model with US connection for compressed air Atlas Copco (ISO 6150B)</p> |



2.3 TOP DEVELOPMENT FOR ANITA EZ0901

To enrich the use of the Anita EZ09 in several contexts of work : very large repairs, use in hangars, positioned with recess access, GMI has developed two complementary instruments :

- a) An extension of thermocouple sensing capability
- b) A tablet for remote control (using Wi-Fi connection)

2.3.1 SCANNER - THERMOCOUPLE EXTENSION - 12 OR 24 TC

| Item | P/N | Description |
|--------------------|-----|--|
| 2311 GMIEZS012- T* | | <p>Scanner for TC extension 12 TC To extend the capacity of temperature measurement by connecting a scanner of 12 TC Wireless link to the Anita.</p> <ul style="list-style-type: none"> - The scanner can easily be positioned close to the repair and this is useful in case of difficult access, the Anita being positioned at distance. - Automatically detected by the Anita. - Scanner capacity 12= 2 x 6 TC J or K. <p>- Total capacity of TC (scanner + Anita) = 24 TC - Practical use : 12 TC per zone or 24 on 1 zone</p> |
| 2312 GMIEZS024-T* | | <p>Scanner for TC extension 24 TC Description is the same as above, but the total number of TC will be 36 TC</p> |



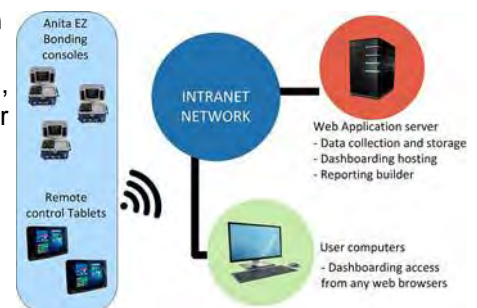
2.3.2 TABLET FOR REMOTE CONTROL OF ANITA EZ0901

| Item | P/N | Description |
|----------------|-----|--|
| 2321 GMIEZR010 | | <p>Touch Screen Tablet for Remote control</p> <p>We offer now the possibility to control the Anita EZ from distance with through a latest technology Wi-Fi linking the Anita to a remote Tablet. The tablet will duplicate the Anita EZ screen.</p> <p>A field operator will be able to supervise the cycle remotely.</p> <p>Alarms are transferred by a speaker and on the tablet screen.</p> |



2.3.3 PANOPTES - SUPERVISION AND FILE GESTION SYSTEM

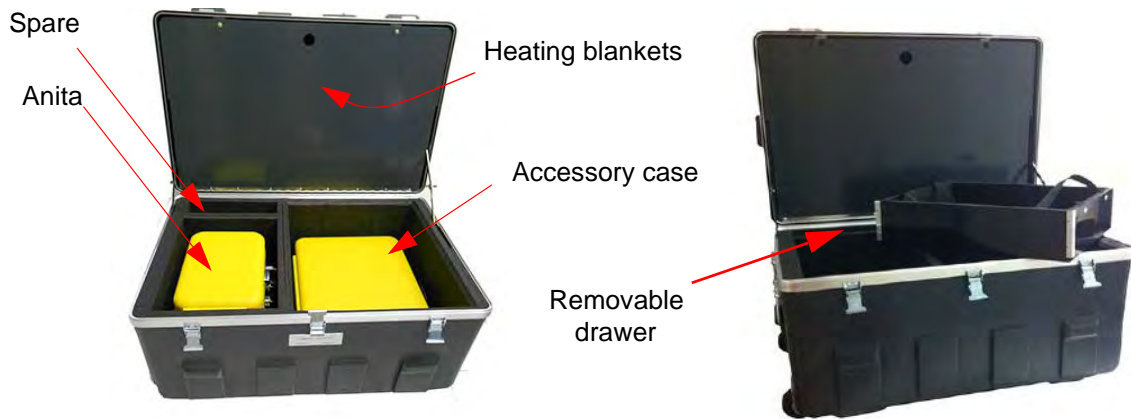
| Item | P/N | Description |
|----------------|-----|--|
| 2331 GMIOR1801 | | <p>Panoptes Supervision & File Gestion</p> <p>This application allows the supervision, in a distant office, the status of one or many consoles working in the shop.</p> <p>You will be able to reproduce the screens of the consoles and see the informations in real time of on-going operations. For more details, consult us.</p> |



3 ANITA CONTAINERS FOR STORAGE AND TRANSPORT

3.1 LARGE STORAGE CONTAINER

| Item | P/N | Description |
|------|-----------|--|
| 3101 | GMIEZC012 | <p>Large container for storage and transport Anita and accessory case (and blankets)</p> <p>For all Anitas: NG; EZ or EZH, QS and QSH</p> <p>Dimensions : L x W x H: 82 x 58 x 50 cm Weight when empty : approx 17 Kg</p> |



3.2 FOR EASY TRANSPORT OF ANITA EZ09

| Item | P/N | Description |
|------|-----------|--|
| 3201 | GMIEZC011 | <p>Large container for storage and transport Anita EZ and accessories</p> <p>Easy to handle container when travelling ; can be registered as carry-on You can install one Anita EZ09 and its cables and hoses</p> <p>Dimensions ext : L x w x H : 50 x 45 x 40 cm Weight when empty : approx 8 Kg</p> |



3.3 ANITA QUICK START GMIQS1Z - 1 ZONE

| Item | P/N | Description |
|------|---------|---|
| 3301 | GMIQS1Z | <p>Bonding Console Anita Quick Start QS</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 1 Heating Zone - Touch Screen - 6 Thermocouples (J or K) - Exclusive software for Fully Automatic Control of Temperature Cycle - Easy programming & pre-programming of cycles - Vacuum pump venturi on request - Vacuum sensing return line - Quick set to run - Automatic reporting of curing cycles - USB port to save reports of curing cycles - Automatic adaptation to 120V/230V environment - Delivered complete with its accessory case |



3.4 ANITA GMIEZ4Z - UP TO 4 INDEPENDENT REPAIRS

| Item | P/N | Description |
|------|-----------|---|
| 3401 | GMIEZ4Z01 | <p>Bonding Console Anita 4Z</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 4 Heating Zones independent or simultaneous control - Touch Screen - 12 Thermocouples (J or K) - 4 Vacuum sensing return line - Quick set to run - Automatic reporting of curing cycles - USB port to save reports of curing cycles - Automatic adaptation to 120V/230V environment - Total power capacity: 30 A x 230 V - Each zone equipped with a power capacity of: 20A - Delivered complete with its accessory case <p>Useful for:</p> <ul style="list-style-type: none"> - Intensive repair on parts with multiple impacts - Radome Repair - When blankets have 3 to 4 zones - Helicopter blade repair |



4 ANITA SERIES RAPID

This model is designed to offer to the users a **quick and low cost** way to control heat sources. This Anita of the series **Rapid** will control for an immediate run after a quick and easy set up various heat applications : use of heat gun, radiant lamp, mould heaters... These models are useful for composite repair activities and composite part manufacturing processes.

| Item | P/N | Description |
|------|----------|--|
| 4001 | GMIAR010 | <p>Bonding Console - Anita rapid</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 1 Heating Zone - Push Button - 4 Thermocouples (J or K) - USB port to <u>program</u> the cycles through a PC Software - Power output: 16A - Delivered complete with its accessory case <ul style="list-style-type: none"> • Various configuration possible for control of <ul style="list-style-type: none"> – Heat blanket – Infra red lamp – Heat gun |



5 FLIGHT LINE ANITA MODELS

5.1 MODEL EZH - FOR 2 REPAIRS

| Item | P/N | Description |
|------|------------|--|
| 5101 | GMIEZH1401 | <p>Bonding Console Flight Line 2 zones - Anita EZH</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 2 zones controlled simultaneously OR independently - ATEX - Touch Screen - 12 thermocouples (J or K) - Printer - Easy programming - Quick set to run - Automatic reporting of curing cycles - USB port to save reports of curing cycles - Automatic adaptation to 120V/230V environment - Delivered complete with its accessory case <p>For conducting bonding on the aircraft if explosive proof conditions apply</p> |



Accessory Case : Electrical cables, hoses, thermocouples, valves
 For the filtration of compressed air to vent the console in order to comply with regulation, see the filter against oil and water proposed as below

| | | |
|------|------------|---|
| 5102 | GMIOTPF022 | Container for filter and filter against oil and water. Connects directly to the air source and to the Anita |
|------|------------|---|





| | | |
|-----|--------------|--|
| 511 | GMIOTPF022-1 | Spare cartridge against water and oil for filter above |
|-----|--------------|--|

5.2 ANITA QSH FLIGHT LINE MODEL - 1 ZONE

| Item | P/N | Description |
|------|----------|--|
| 5201 | GMIQSH1Z | <p>Bonding Console Flight Line 2 zones - Anita QSH</p> <p>Characteristics:</p> <ul style="list-style-type: none"> - 1 Heating Zone - ATEX - Touch Screen - 6 thermocouples (J or K) - Easy programming & pre-programming of cycles - Quick set to run - Automatic reporting of curing cycles - Vacuum pump venturi included or not on request - Vacuum sensing return line - USB port to save reports of curing cycles - Delivered complete with its accessory case <p>For conducting bonding on the aircraft if explosive proof conditions apply</p> |




6 ANITA BATTLE FIELD MODEL

| Item | P/N | Description | |
|------|---------------|---|--|
| 6001 | GMICC010 | <p>Bonding Console Anita Battle Field</p> <p><u>Characteristics:</u></p> <ul style="list-style-type: none"> - 1 Heating Zone - 6 Thermocouples (J or K) - Exclusive software for Fully Automatic Control of Temperature Cycle - Easy programming & pre-programming of cycles - Vacuum pump venturi on request - Vacuum sensing return line - Quick set to run - Automatic reporting of curing cycles - USB port to save reports of curing cycles - Automatic adaptation to 120V/230V environment - Delivered complete with its accessory case |  |
| 6002 | GMIHBIS045-1Z | <p>Heating system for battle field context To be controlled by Anita EZ or NG or Battle field Anita Model as above</p> <p>Seal dimensions: Diameter: Ø 45 cm Heating area diameter: Ø 35 cm 1 electrical zone</p> <p>Please consult us for other dimensions</p> |  |

This blanket can also be useful for quick installation of relatively small damage in field intervention context

7 MINI SCANNER - ANISCAN

| Item | P/N | Description | |
|------|-----------|---|---|
| 7001 | GMISC04-J | <p>Aniscan Mini scanner - Curing Data Logger</p> <p>4 Thermocouple plugs, J or K according to needs</p> <p>Autonomous to register any heating process. USB plug to get the last cycle saved Can connect to a PC to exploit the data Ideal for independent IR system.</p> |  |
| | or | | |
| | GMISC04-K | | |

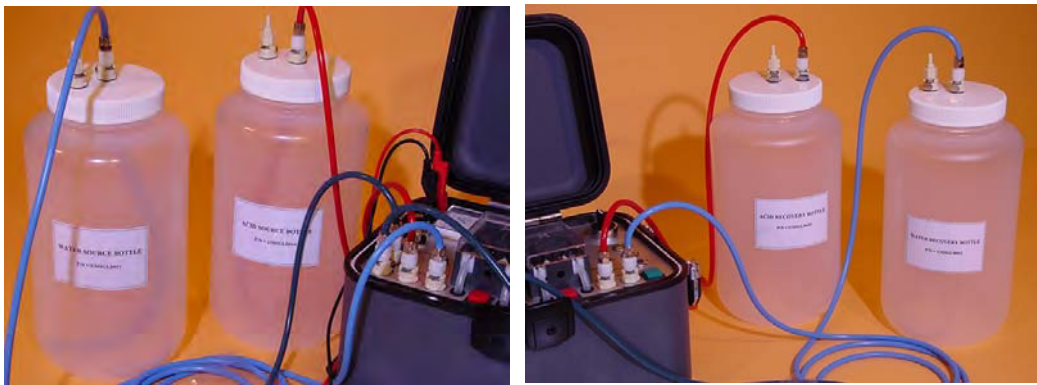
8 OLGA - PORTABLE SYSTEM FOR PRESSURISATION OF REPAIR PATCH

| Item | P/N | Description |
|------|----------|--|
| 8001 | GMIOLO10 | <p>OLGA Portable system for pressurisation of advanced composite repair bonding Composed of:</p> <ul style="list-style-type: none"> - The pressurisation tool with its flexible pads for adaptation to contoured parts, - The pressure and vacuum generator with safety function controller |



9 GILDA - METAL BONDING - SURFACE TREATMENT

| Item | P/N | Description |
|---------------|-----|---|
| 9001 GMIGL010 | | GILDA Console for aluminium surface treatment To perform phosphoric solution anodizing Delivered complete with all its accessories to conduct the process of aluminium surface preparation before bonding |



10 ANITA 6 ZONES - HIGH POWER - 6 REPAIRS

APPLICATIONS TO REVERSERS AND OTHER LARGE REPAIR WORKS

| Item | P/N | Description |
|-------|---------|--|
| 10001 | GMI6Z40 | <p>As a bench, this model is for various applications from radome to reversers. Anita 6 zones with 6 independent heating channels for: 1 repair up to 6 zones or 6 repairs independent in program and time with various combination of zones. This bench is powered under 3 phases to offer a large power capacity of: 40 Kwatt total power; each of 6 zones with a capacity of 230 V x 30 A.</p> <p>Intensive repair on parts with multiple impacts</p> <ul style="list-style-type: none"> - Radome Repair - Reverser repairs : Transcowls and Corecowls - Complex repair when blankets have 3 to 4 zones, - Helicopter blade repair <ul style="list-style-type: none"> • 36 Temperature measurements: through thermocouples (type J or K). • Vacuum circuits: 6 <p>This equipment allows also to conduct 6 independent repairs at different times according to different cycles.</p> |




For Reverser and Radome multi zone blankets see the corresponding Heat Blanket Section

11 ANITA 18 ZONES

To repair very large surfaces of structures of class I, GMI has designed a specific bonding control equipment with **18 zones**.

This equipment combines a sophisticated instrumentation with smart software for cycle programming and configuration of the repair parameters. A power system is specially designed to offer powering capabilities to the 18 zones covering several square meters.

| Item | Description |
|--|---|
| 11001 System with 18 zones capability. Power per zone 230 V x 20 A . Up to 80 Thermocouples Up to 7 vacuum sensing lines Measurement of autoclave pressure in case of using a vessel for pressure compaction Automatic report fabrication |  |

(2) HEATING BLANKETS & OTHER HEATING SYSTEMS

The list below describes the more frequently requested products.

In this chapter you will find this variety of heating means and specialised heating blankets :

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| 28 - HEAT FLEXIBLE INSULATOR | 38 |

For other needs, please consult us.

12 HEATING BLANKETS - GENERAL OFFER

We give here a list of classes of heating blankets designed and produced according to their use:

1. For hot bonding of composite repair processes
2. For general heat application whenever it is useful to improve productivity by heating a resin, a sealant, etc.
3. For heating parts in a composite manufacturing process: heating moulds, structures, etc.

The following table presents the various classes of blankets used in the repair process. These classes differ because of temperature limits and one class offers more flexibility when it is necessary to conform to a non developable surface. Also we have designed several heating blankets having a pre-determined shape for specific applications : radome repair, reverser repair, etc. Also blankets are designed differently for flight line applications. We produce for this context blankets with ATEX specifications.

Standard = Flexible

They constitute the basic tools for composite repair as they are flexible and resistant to external aggressions. They are made with silicone reinforced with glass fiber. We can offer:

- Blankets **rectangular** or **circular** or **ovals**
- **120** or **230** Volts monophase
- **1** or **2 zones** design or more
- **Small** or **very large** dimensions



Conformable or Stretchable

Those blankets are more stretch than the standard ones. They give a better diffusion of heat and can better adapt to curved surfaces such as double curvature.

- Blankets **rectangular** or **circular** or **ovals**
- **120** or **230** Volts monophase
- **1** or **2 zones** design or more
- Maximum size : **60 x 60 cm**



Blankets for flight line applications (ATEX)

They are more rigid than the flexible ones used in workshop, however still applicable easily on curved surfaces



Radome Shaped Blankets

Several models available according to aircraft.



Very large blankets powered through boosters
Specific Applications for Reversers and Air inlets



Autonomous blankets that work with specific autonomous controllers for simple jobs: interiors, heating of moulds for lay up operations...



13 STANDARD FLEXIBLE BLANKETS

| Item | P/N | Dimensions in cm | Zones |
|---|-------------------|------------------|--------------------|
| RECTANGULAR SHAPES | | | |
| 13001 | GMIHB015015-1Z-V* | 15 X 15 | 1 electrical zone |
| 13002 | GMIHB020030-1Z-V* | 20 X 30 | 1 electrical zone |
| 13003 | GMIHB020040-1Z-V* | 20 X 40 | 1 electrical zone |
| 13004 | GMIHB025025-1Z-V* | 25 X 25 | 1 electrical zone |
| 13005 | GMIHB025040-1Z-V* | 25 X 40 | 1 electrical zone |
| 13006 | GMIHB030030-1Z-V* | 30 X 30 | 1 electrical zone |
| 13007 | GMIHB030050-1Z-V* | 30 X 50 | 1 electrical zone |
| 13008 | GMIHB030060-1Z-V* | 30 X 60 | 1 electrical zone |
| 13009 | GMIHB030070-1Z-V* | 30 X 70 | 1 electrical zone |
| 130010 | GMIHB040040-1Z-V* | 40 X 40 | 1 electrical zone |
| 130011 | GMIHB040060-1Z-V* | 40 X 60 | 1 electrical zone |
| 130012 | GMIHB040080-2Z-V* | 40 X 80 | 2 electrical zones |
| 130013 | GMIHB050075-1Z-V* | 50 X 75 | 1 electrical zone |
| 130014 | GMIHB050090-2Z-V* | 50 X 90 | 2 electrical zones |
| 130015 | GMIHB060060-1Z-V* | 60 X 60 | 1 electrical zone |
| 130016 | GMIHB060080-2Z-V* | 60 X 80 | 2 electrical zones |
| 130017 | GMIHB070090-2Z-V* | 70 X 90 | 2 electrical zones |
| CIRCULAR SHAPES | | | |
| 130018 | GMIHB020-1Z-V* | ∅ 20 | 1 electrical zone |
| 130019 | GMIHB025-1Z-V* | ∅ 25 | 1 electrical zone |
| 130020 | GMIHB035-1Z-V* | ∅ 35 | 1 electrical zone |
| 130021 | GMIHB040-1Z-V* | ∅ 40 | 1 electrical zone |
| 130022 | GMIHB045-1Z-V* | ∅ 45 | 1 electrical zone |
| 130023 | GMIHB055-1Z-V* | ∅ 55 | 1 electrical zone |
| * with V = 1 for 120 V and V = 2 for 230V | | | |



13.1 CERTIFICATION

Boeing specifies for its own use, blankets according to certain specifications dealing with temperature distribution. **These performances can only be achieved if the resistance wire is routed with a maximum of density and regularity.**

GMI manufactures its blankets to meet this specification recommendation.

The blanket is delivered with a sticker that reveals its native resistance value after checking that it corresponds to the calculated value of construction. This sticker is attached to the blanket.

For standard blanket of regular shapes (other cases, consult us), GMI can also deliver the blanket, under request, with a thermal uniformity certificate per Boeing specs [D6-56273](#).

14 BLANKETS STRETCHABLE OR CONFORMABLE

| Item | P/N | Dimensions in cm | Zones |
|---|--------------------|------------------|-------------------|
| RECTANGULAR SHAPES | | | |
| 14001 | GMIHBC015015-1Z-V* | 15 X 15 | 1 electrical zone |
| 14002 | GMIHBC020020-1Z-V* | 08 X 25 | 1 electrical zone |
| 14003 | GMIHBC025025-1Z-V* | 25 X 25 | 1 electrical zone |
| 14004 | GMIHBC030030-1Z-V* | 30 X 30 | 1 electrical zone |
| 14005 | GMIHBC035035-1Z-V* | 35 X 35 | 1 electrical zone |
| 14006 | GMIHBC040040-1Z-V* | 40 X 40 | 1 electrical zone |
| 14007 | GMIHBC020040-1Z-V* | 20 X 40 | 1 electrical zone |
| 14008 | GMIHBC045045-1Z-V* | 45 X 45 | 1 electrical zone |
| 14009 | GMIHBC050050-1Z-V* | 50 X 50 | 1 electrical zone |
| 140010 | GMIHBC060060-1Z-V* | 60 X 60 | 1 electrical zone |
| CIRCULAR SHAPES | | | |
| 140011 | GMIHBC020-1Z-V* | ∅ 20 | 1 electrical zone |
| 140012 | GMIHBC025-1Z-V* | ∅ 25 | 1 electrical zone |
| 140013 | GMIHBC035-1Z-V* | ∅ 35 | 1 electrical zone |
| 140014 | GMIHBC040-1Z-V* | ∅ 40 | 1 electrical zone |
| 140015 | GMIHBC045-1Z-V* | ∅ 45 | 1 electrical zone |
| 140016 | GMIHBC055-1Z-V* | ∅ 55 | 1 electrical zone |
| * with V = 1 for 120 V and V = 2 for 230V | | | |



Note : Maximum dimensions in stretchable blankets: 60 cm x 60 cm / 24 x 24 inches.

15 BLANKETS FOR FLIGHT LINE OPERATIONS

15.1 FOR ATEX MODELS OF ANITA - GMIEZH OR GMIQSH

| Item | P/N | Dimensions in cm | Zones |
|---|-------------------------|------------------|-------------------|
| <p>Despite being embedded with ground mesh, the ATEX blankets still remain flexible. They must be used with specific consoles for explosive atmosphere such Anita EZH or QSH in order to reach a full ATEX environment. Other dimensions available on demand.</p> | | | |
| RECTANGULAR SHAPE | | | |
| 15101 | GMIHBH015015-1Z-V*-T* | 15 X 15 | 1 electrical zone |
| 15102 | GMIHBH020020-1Z-V*-T** | 20 X 20 | 1 electrical zone |
| 15103 | GMIHBH025025-1Z-V*-T*** | 25 X 25 | 1 electrical zone |
| 15104 | GMIHBH030030-1Z-V*-T** | 30 X 30 | 1 electrical zone |
| 15105 | GMIHBH040040-1Z-V*-T** | 40 X 40 | 1 electrical zone |
| 15106 | GMIHBH050050-1Z-V*-T** | 50 X 50 | 1 electrical zone |
| 15107 | GMIHBH015050-1Z-V*-T** | 15 X 50 | 1 electrical zone |



CIRCULAR SHAPE

| | | | |
|--------|---------------------|------|-------------------|
| 15108 | GMIHBH025-1Z-V*-T** | ∅ 25 | 1 electrical zone |
| 15109 | GMIHBH030-1Z-V*-T** | ∅ 30 | 1 electrical zone |
| 151010 | GMIHBH035-1Z-V*-T** | ∅ 35 | 1 electrical zone |
| 151011 | GMIHBH050-1Z-V*-T** | ∅ 50 | 1 electrical zone |
| 151012 | GMIHBH055-1Z-V*-T** | ∅ 55 | 1 electrical zone |
| 151013 | GMIHBH060-1Z-V*-T** | ∅ 60 | 1 electrical zone |

* where V = 1 for 120 Volts and V=2 for 230 Volts

** where T stands for optional thermostat mounted at 200°C.

15.2 FOR OLDER MODEL ANITA OTHE04

| Item | P/N | Dimensions in cm | Zones |
|---|--------------------|------------------|-------------------|
| <p>Despite being embedded with ground mesh, the ATEX blankets still remain flexible. They must be used with specific consoles for explosive atmosphere such Anita OTHE04 in order to reach a full ATEX environment. Other dimensions available on demand. Those models are only available in 230V.</p> | | | |
| 15201 | GMIHB015015-1Z-2-G | 15 X 15 | 1 electrical zone |
| 15202 | GMIHB020020-1Z-2-G | 20 X 20 | 1 electrical zone |
| 15203 | GMIHB025025-1Z-2-G | 25 X 25 | 1 electrical zone |
| 15204 | GMIHB030030-1Z-2-G | 30 X 30 | 1 electrical zone |
| 15205 | GMIHB040040-1Z-2-G | 40 X 40 | 1 electrical zone |
| 15206 | GMIHB050050-1Z-2-G | 50 X 50 | 1 electrical zone |
| 15207 | GMIHB015050-1Z-2-G | 15 X 50 | 1 electrical zone |

16 HIGH TEMPERATURE BLANKETS

16.1 FOR REPAIRS UP TO 235°C

| Item | P/N | Dimensions in cm | Zones |
|---|-------------------|------------------|-------------------|
| Blankets with silicone reinforced These blankets have the same aspect and mechanical properties as the standard blankets above. Maximum temperature of repairs to be around 235°C Some useful dimensions below under 230 Volts . Other dimensions available on demand. | | | |
| 16101 | GMIHBT015015-1Z-2 | 15 X 15 | 1 electrical zone |
| 16102 | GMIHBT020020-1Z-2 | 08 X 25 | 1 electrical zone |
| 16103 | GMIHBT025025-1Z-2 | 25 X 25 | 1 electrical zone |
| 16104 | GMIHBT030030-1Z-2 | 30 X 30 | 1 electrical zone |
| 16105 | GMIHBT035035-1Z-2 | 35 X 35 | 1 electrical zone |
| 16106 | GMIHBT040040-1Z-2 | 40 X 40 | 1 electrical zone |
| 16107 | GMIHBT020040-1Z-2 | 20 X 40 | 1 electrical zone |
| 16108 | GMIHBT045045-1Z-2 | 45 X 45 | 1 electrical zone |
| 16109 | GMIHBT050050-1Z-2 | 50 X 50 | 1 electrical zone |

16.2 FOR REPAIRS UP TO 400°C

| Item | P/N | Dimensions in cm | Zones |
|---|-------------------|------------------|-------------------|
| Blankets with silicone reinforced for heating of thermoplastic structures up to 400°C . those blankets operate under 230 Volts . Other dimensions available on demand. | | | |
| 16201 | GMIHBP015015-1Z-2 | 15 X 15 | 1 electrical zone |
| 16202 | GMIHBP020020-1Z-2 | 08 X 25 | 1 electrical zone |
| 16203 | GMIHBP025025-1Z-2 | 25 X 25 | 1 electrical zone |
| 16204 | GMIHBP030030-1Z-2 | 30 X 30 | 1 electrical zone |
| 16205 | GMIHBP035035-1Z-2 | 35 X 35 | 1 electrical zone |
| 16206 | GMIHBP040040-1Z-2 | 40 X 40 | 1 electrical zone |
| 16207 | GMIHBP020040-1Z-2 | 20 X 40 | 1 electrical zone |
| 16208 | GMIHBP045045-1Z-2 | 45 X 45 | 1 electrical zone |
| 16209 | GMIHBP050050-1Z-2 | 50 X 50 | 1 electrical zone |

17 LARGE AND VERY LARGE (HIGH POWER) BLANKETS

The larger blankets are generally above **1 square meter**, and their total power is above 6000 watts. **Two** technologies are available according to our continuous development research program.

17.1 BLANKETS HIGH POWER UNDER THREE PHASE DESIGN

Blankets of very large power are designed under **3 Phases** (380 or 415 Volts)
These blankets need the use of the Power Booster as listed below.

| Item | P/N | Dimensions in cm | Zones |
|-------|---------------------|------------------|-----------------------|
| 17101 | GMIHB100150-2Z-3-V* | 100 X 150 | In 2 electrical zones |
| 17102 | GMIHB100200-2Z-3-V* | 100 X 200 | In 2 electrical zones |

* where V= 380, 415 or 480 VAC or other to be specified. Many other models available, please consult us

17.2 BLANKETS HIGH POWER - DC DESIGN

GMI has also developed new technology capability in switching DC power. The blankets are designed for a DC electrical powering. The blankets have a simplified wiring compared to the one necessary under 3 phase design. These blankets need a DC Power Booster-Converter as described below :

| Item | P/N | Dimensions in cm | Zones |
|-------|---------------------|------------------|-----------------------|
| 17201 | GMIHBD100150-2Z- V* | 100 X 150 | In 2 electrical zones |
| 17202 | GMIHBD100200-2Z- V* | 100 X 200 | In 2 electrical zones |

* where V = 380; 410; or 480 VAC as power in to the DC Power converter and amplifier

17.3 POWER CONVERTER 3 PHASES - FOR DC DESIGNED BLANKETS

| Item | P/N | Description |
|-------|--------------|--|
| 17301 | GMIBDC010-V* | <p>Power Converter 3 Phases : This allows connection to Anita consoles of blankets very large requiring more than 6000 watts and designed under DC voltage.</p> <p>Allows connection to 3 Phase Voltage Capacity: 32 kW 2 independent channels of 16 kW each</p> <p>* V= 380, 410 or 480 VAC input power</p> |



17.4 POWER AMPLIFIER 3 PHASES FOR BLANKETS 3 PHASES DESIGN

This model is for blankets having been designed under 3 phases voltage circuit

| Item | P/N | Description |
|-------|--------------|---|
| 17401 | GMIANB102-V* | <p>Power Amplifier 3 Phases : This allows connection to Anita consoles of blankets very large requiring more than 6000 watts.</p> <p>Allows connection to 3 Phase Voltage 2 independent channels Other Boosters are available for higher power</p> <p>*V=380, 410 or 480 depending on VAC input</p> |
| 17402 | GMIANB302-V* | <p>Power Amplifier 3 Phases</p> <p>Other model possible on this model you can find 2 independent zones with each 3 possible connections</p> <p>*V=380, 410 or 480 depending on VAC input</p> |



18 BLANKET CONNECTING ACCESSORIES

MULTIPLE BLANKET CONNECTION SOLUTIONS

| Item | P/N | Description |
|-------|-----------|--|
| 18001 | GMINGE102 | Cable to connect 2 blankets in parallel Allows an Anita to drive 2 x 2 blankets simultaneously |
| 18002 | GMIANE104 | Box for connection of 4 blankets in parallel Allows an Anita to drive 2 x 4 blankets simultaneously |

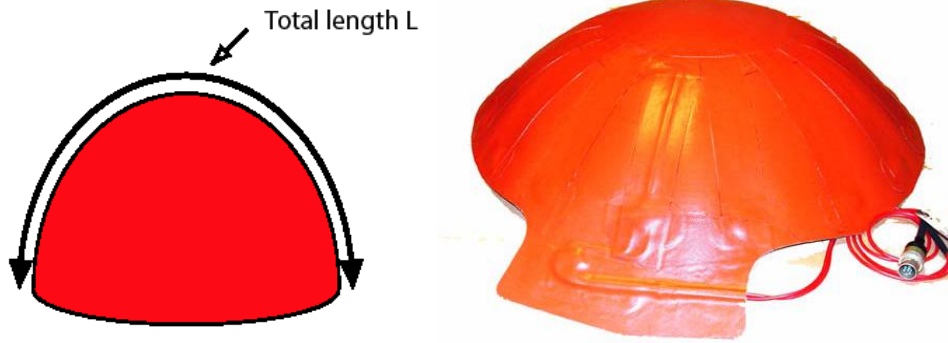


19 RADOME SHAPED BLANKETS

GMI can offer a wide range of moulded blankets shaped to radomes of Boeing, Airbus, Bombardier CRJ, ATR.

19.1 DEFINITIONS FOR BLANKET IDENTIFICATION

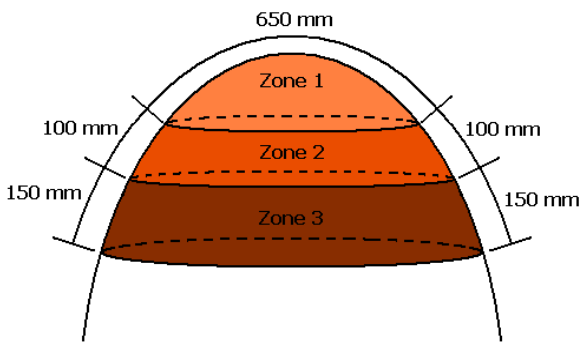
A. DEVELOPED LENGH



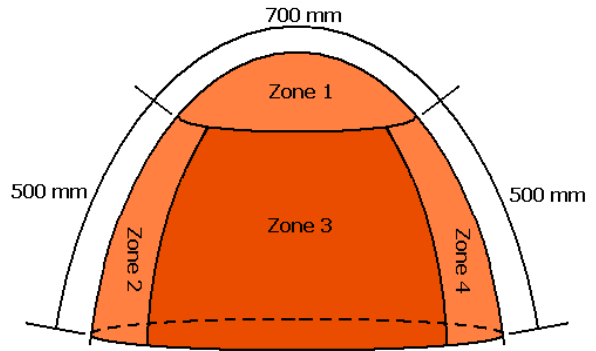
B. SECTOR AND CONCENTRIC ZONES

The radome can be designed either with **concentric zoning** or **sector zoning** (see the pictures below).

They can be also designed in one electric zone covering only the tip of a flange area of the radome.



Total developed length : 1 150 mm (# 45 inches)
3 concentric heating zones



Total developed length : 1700 mm (# 55 inches)
4 heating zones in sectors

19.2 AIRBUS MODELS

19.2.1 4 SECTORS BLANKETS

| Item | P/N | Description |
|---|----------------------|--|
| Family Airbus A320 Narrow Body - 230V Blankets | | |
| 19211 | GMIHBR-320-E4S-170-2 | For External skin in 4 Sectors ; overall length 1700 mm |
| 19212 | GMIHBR-320-I4S-170-2 | For Internal skin in 4 Sectors ; overall length 1700 mm |
| Family Airbus A340 Narrow Body - 230V Blankets | | |
| 19213 | GMIHBR-340-E4S-170-2 | For External skin in 4 Sectors ; overall length 1700 mm |
| 19214 | GMIHBR-340-I4S-170-2 | For Internal skin in 4 Sectors ; overall length 1700 mm |

19.2.2 3 CONCENTRIC ZONES BLANKETS

| Item | P/N | Description |
|---|----------------------|---|
| Family Airbus A320 Narrow Body - 230V Blankets | | |
| 19221 | GMIHBR-320-E3C-170-2 | For External skin in 3 Concentric Zones ; overall length 1700 mm |
| 19222 | GMIHBR-320-I3C-170-2 | For Internal skin in 3 Concentric Zones ; overall length 1700 mm |
| 19223 | GMIHBR-320-E3C-120-2 | For External skin in 3 Concentric Zones ; overall length 1200 mm |
| 19224 | GMIHBR-320-I3C-120-2 | For Internal skin in 3 Concentric Zones ; overall length 1200 mm |
| Family Airbus A340 Narrow Body - 230V Blankets | | |
| 19225 | GMIHBR-340-E3C-170-2 | For External skin in 3 Concentric Zones ; overall length 1700 mm |
| 19226 | GMIHBR-340-I3C-170-2 | For Internal skin in 3 Concentric Zones ; overall length 1700 mm |
| 19227 | GMIHBR-340-E3C-115-2 | For External skin in 3 Concentric Zones ; overall length 1150 mm |
| 19228 | GMIHBR-340-I3C-115-2 | For Internal skin in 3 Concentric Zones ; overall length 1150 mm |

19.3 AIRBUS - TIP COVERAGE - A320 - A340 - A380

These blankets are reversible and can fit internal or external skins



| Item | P/N | Description |
|--|-----------------------|--|
| Family Airbus A320 (A319, A320, A321) Narrow Body | | |
| 1931 | GMIHBR-320-1Z-040-V* | Overall length 400 mm - External and internal skin |
| 1932 | GMIHBR-320-E1Z-065-V* | Overall length 650 mm - External skin |
| 1933 | GMIHBR-320-I1Z-065-V* | Overall length 650 mm - Internal skin |
| Family Airbus A340 Wide Body | | |
| 1934 | GMIHBR-340-E1Z-065-V* | Overall length 650 mm - External skin |
| 1935 | GMIHBR-340-I1Z-065-V* | Overall length 650 mm - Internal skin |
| For Airbus A380 | | |
| 1936 | GMIHBR-380-E1Z-080-V* | Overall length 800 mm - External skin |
| 1937 | GMIHBR-380-I1Z-080-V* | Overall length 800 mm - Internal skin |

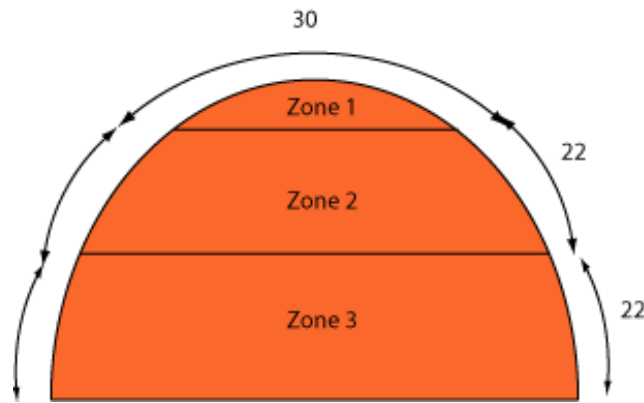
19.4 BOEING RADOME MODELS

| Item | P/N | Description |
|-----------------------|----------------------|---|
| For Boeing 747 | | |
| 19401 | GMIHBR-747-I3C-125-2 | - Internal Skin - Developed length 1250 mm - in 3 electrical concentric zones 220 Volts |
| 19402 | GMIHBR-747-E3C-125-2 | - External Skin - Developed length:1250 mm - in 3 electrical concentric zones 220 Volts |
| For Boeing 737 | | |
| 19403 | GMIHBR-737-I4S-110-2 | - Internal Skin - Developed length 1100 mm - in 4 electrical sectors 220 Volts |
| For Boeing 737 | | |
| 19404 | GMIHBR-737-E4S-110-2 | - External Skin - Developed length 1100 mm - in 4 electrical sectors 220 Volts |
| For Boeing 777 | | |
| 19405 | GMIHBR-777-E4S-90-2 | - Internal Skin - Developed length 900 mm - in 4 electrical sectors 220 Volts |

19.5 ATR 42 OR ATR 72 RADOME MODELS

The radome blankets are proposed in **3 concentric zones** or **4 sectors**. See dimensions below. Each design is offered for installation on **internal skin** or **external skin**

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|



Models in Concentric zones For ATR 42/72

19501 GMIHBR72-I3C-120-2 - **Internal Skin**
 - Developed length **1200 mm**
 - in 3 electrical concentric zones **230 Volts**

19502 GMIHBR72-E3C-120-2 - **External Skin**
 - Developed length **1200 mm**
 - in 3 electrical concentric zones **230 Volts**

19.6 BOMBARDIER CRJ RADOME MODELS

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

19601 GMIHBRCRJ-E2C-046-V* - **For external skin**
 - Developed length **460 mm**
 - in 2 electric zones; concentric

19602 GMIHBRCRJ-I2C-046-V* - **For internal skin**
 - Developed length **460 mm**
 - in 2 electric zones; concentric



*V = 1 for 120 Volts
 *V= 2 for 230 volts

20 BLANKETS FOR REVERSERS

This blanket is made to be used with our System Anita **6Z40** for Reverser Repair (see chapter A)
All blanket electrical circuits per zone described below are under 230 Volts monophas



20.1 BLANKETS FOR T/COWL CF6-80C2 PER SEGMENT

| Item | P/N | Description |
|---|--------------------|---|
| <p>In case the customer does not want to proceed to complete skin overhaul, we can propose blankets covering only the sectors. If we sketch the skin of the T/C with 6 sectors, the table below gives the P/N of the independent blankets. Those blankets operate under 230 Volts monophas and can be controlled by our different Anita Consoles or by the 6 Zones Anita</p> | | |
| 20101 | GMIHBTR06-01-1Z-2 | 1 Blanket for segment 1 - Left Rear side |
| 20102 | GMIHBTR06-02-1Z-2 | 1 Blanket for segment 2 - Central Rear side |
| 20103 | GMIHBTR06-03-1Z-2 | 1 Blanket for segment 3 - Right Rear side |
| 20104 | GMIHBTR06-04-1Z-2 | 1 Blanket for segment 4 - Left Front Side |
| 20105 | GMIHBTR06-05-1Z-2 | 1 Blanket for segment 5 Central Front side |
| 20106 | GMIHBTR06-06 -1Z-2 | 1 Blanket for segment 6 - Right Front Side |



20.2 GENERAL PROGRAM FOR COMPLETE TRASCOWLS AND CORECOWLS



| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

FOR CF6-80C2

For Transcowls

| | | |
|-------|------------------|---|
| 20201 | GMIHBTR-CF6-G-2 | Set of 2 blankets for T/C Grumman Left or Right - each blanket in 3 zones - 230V Monophase |
| 20202 | GMIHBTR-CF6-MM-2 | Set of 2 blankets for T/C Martin Marietta Left or Right - each blanket in 3 zones - 230V Monophase |

For Corecowls

| | | |
|-------|-----------------|--|
| 20203 | GMIHBCR-CF6-1-2 | Set of 3 Blankets for Corecowl LEFT Side - 230V Monophase |
| 20204 | GMIHBCR-CF6-2-2 | Set of 3 Blankets for Corecowl RIGHT Side - 230V Monophase |

FOR CF6-80E1 - AIRBUS A310

For Transcowls

| | | |
|-------|---------------------|---|
| 20205 | GMIHBTR-CF6-80E1-V2 | Set of 2 blankets for Translating Sleeve CF6-80E1 for A330 |
|-------|---------------------|---|

FOR PW4000 - AIRBUS A310

For Transcowls

| | | |
|-------|----------------------|---|
| 20206 | GMIHBTR-PW4000-310-2 | Set of 2 blankets for Transcowl left or right - 6 zones 230V Monophase |
|-------|----------------------|---|

For Corecowls

| | | |
|------|-------------------------|--|
| 2021 | GMIHBCR-PW4000-310- 1-2 | Set of 3 blankets for Corecowl Left - 6 zones 230V Monophase |
| 2022 | GMIHBCR-PW4000-310-2-2 | Set of 3 blankets for Corecowl Right - 6 zones 230V Monophase |

FOR PW4168 - AIRBUS A330

For Transcowls

| | | |
|------|----------------------|--|
| 2023 | GMIHBTR-PW4168-330-2 | Set of 2 blankets for T/COWL left or right - 6 zones - 230V Monophase |
|------|----------------------|--|

For Corecowls

| | | |
|-------|------------------------|--|
| 20231 | GMIHBCR-PW4168-330-1-2 | Set of 3 blankets for Corecowl Left - 6 zones 230V Monophase |
| 20232 | GMIHBCR-PW4168-330-2-2 | Set of 3 blankets for Corecowl Right - 6 zones 230V Monophase |

21 BLANKET SPECIFIC FOR CFM56 ABRADABLE LINER BONDING

| Item | P/N | Description | |
|--|--------------------|------------------|--------------------|
| <p>The blanket is in 2 electrical zones to be controlled by the ANITA Console. Two identical blankets are necessary to cover the complete circular ring of this engine.</p> | | | |
| 21001 | GMIHBCFM56-A-2Z-V* | Set for CFM56-5A | Airbus A320 family |
| 21002 | GMIHBCFM56-B-2Z-V* | Set for CFM56-5B | Airbus A320 family |
| 21003 | GMIHBCFM56-C-2Z-V* | Set for CFM56-5C | Airbus A340 |
| 21004 | GMIHBCFM56-3-2Z-V* | Set for CFM56-3 | Boeing 737 |



*V =1 for 120 V or V= 2 for 230 V

To control these blankets GMI proposes several solutions with our 1 zone, 2 zones or 4 zones Bonding Consoles.

| | | |
|------------------------------|--------------------------------|--------------------------------|
| Anita 1 zone GMIQS01Z | Anita 2 zones GMIEZ0901 | Anita 4 zones GMIEZ4Z01 |
|------------------------------|--------------------------------|--------------------------------|



21.1 OTHER HEATING PROCESS ON ENGINE CASES

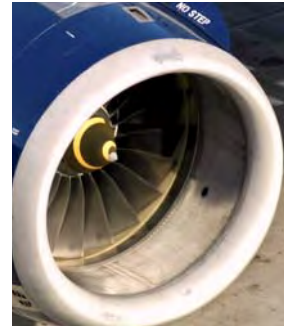
Blankets and Anita consoles above can be also used for controlling several heating processes on metallic structures like for example accelerate the curing cycle of anti-erosion paint or productive products. Please consult us for engineering, technical support and advices.

22 AIR INLET BLANKETS

We can supply the set of blankets to replace wiremesh areas of the Air Inlet. Our set covers the complete ring in 3 blankets.

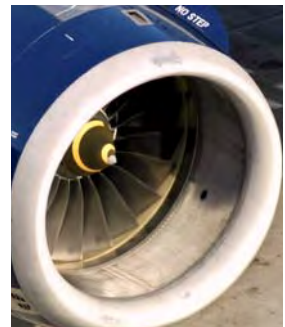
22.1 FOR ENGINE V2500

| Item | P/N | Description |
|-------|---------------|--|
| | | <p>The system is designed in 3 blankets:</p> <ul style="list-style-type: none"> - 1 to cover the upper segment; - 2 similar ones to cover respectively the lower left and lower right sides. <p>Each blanket is manufactured in 2 zones parallel in the length.</p> <p>Approximative dimensions:</p> <ul style="list-style-type: none"> - Blanket Upper: 1530 x 760 x 760 mm - Blanket Lower left: 1730 x 630 x 760 mm - Blanket Lower right: 1850 x 760 x 630 mm |
| 22101 | GMIHBAL-V25-2 | Set of 3 blankets, each on monophase 230 V to connect to our 6 zones Bonder and Power system ANITA 6Z40. |



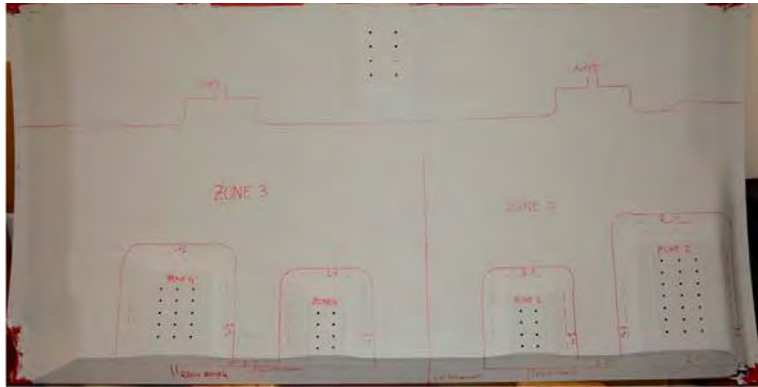
22.2 FOR ENGINE A3300 - PW4168

| Item | P/N | Description |
|-------|----------------|---|
| | | <p>The system is designed in 3 blankets. one covers the upper segment; two to cover respectively the lower left and lower right sides. Each blanket is manufactured in 2 zones parallel in the length.</p> <p>Approximative dimensions:</p> <ul style="list-style-type: none"> - Blanket upper: 1530 x 760 x 760 mm - Blanket lower left: 1730 x 630 x 760 mm - Blanket lower right: 1850 x 760 x 630 mm |
| 22201 | GMIHBAL-4168-2 | Set of 3 blankets, each on monophase 230 V to connect to our 6 zones Bonder and Power system ANITA 6Z40. |



23 BLANKET FOR GE90 COWLING REPAIR

Reconstruction After Water Ingress for Cowling Left or Right (2,15 x 0,9 m approx)



A 6 zones blanket to cover the upper surface of right/left upper cowling area

The control of 6 zones can be done through :
 - 3 Anita EZ 2 zones
 OR



This specific blanket has been designed after an actual series of trials including our services for engineering analysis and thermal transfer simulation ; excellent results to match specifications of **180 °C +/- 5 °C** on the whole area (2,15 x 0,9 m approx.) are obtained with our heating blanket designed in **8 zones optimally**. Consult us to adapt the control solution with our Anita System.

| Item | P/N | Description |
|-------|----------------------|--|
| 23001 | GMIHBGE90-R-8-1805-2 | Heating Blanket Right Cowling ; 8 zones - 230 Volts |
| 23002 | GMIHBGE90-L-8-1805-2 | Heating Blanket Left Cowling ; 8 zones - 230 Volts |

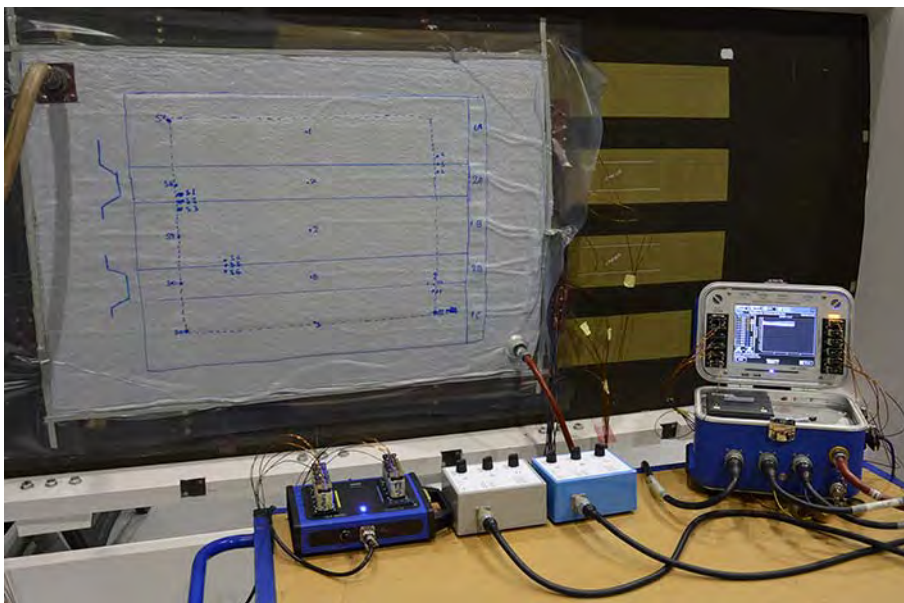
24 ADAPTHEAT® FOR STIFFENED PANEL REPAIR WITH ANITA

ADAPTHEAT™ IS A KIT DEVELOPED BY GMI

AdaptHeat is an innovative heating circuit designed to achieve even temperature distribution on a surface up to typically 80 x 80 cm of a fuselage panel. The innovation consists in a specially designed heating circuit with a certain electrical zoning «adapted» in power to the geometry and thickness of the structure sub-areas to develop heat accordingly to their thermal reactions. It is made to be associated with the appropriate bonding console Anita EZ that implements its unique features for handling two zones heating control and its programmed strategy to handle the thermocouple sensor data.

For one type of stringer family, the operator selects the system according to the dimensions and the installation is made simple thanks to a template supplied appropriately.

The heating process can be controlled by the two heating channels of the Anita EZ Bonding Console, running its unique temperature control software features.



SUPPORT & ASSISTANCE BY A SPECIALIST TEAM

GMI offers a **unique service** to customers who decide to implement this solution. We have trained a team of specialists for intervention in **Europe, Asia, America to assist you with :**

- Analysis of the repair
- Method for construction of the heating system
- Adaptation of the heating system in the field
- Implementation
- Training and transfer of technology

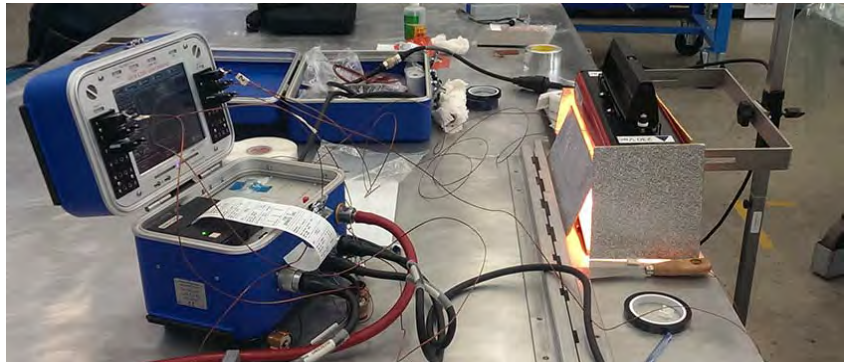
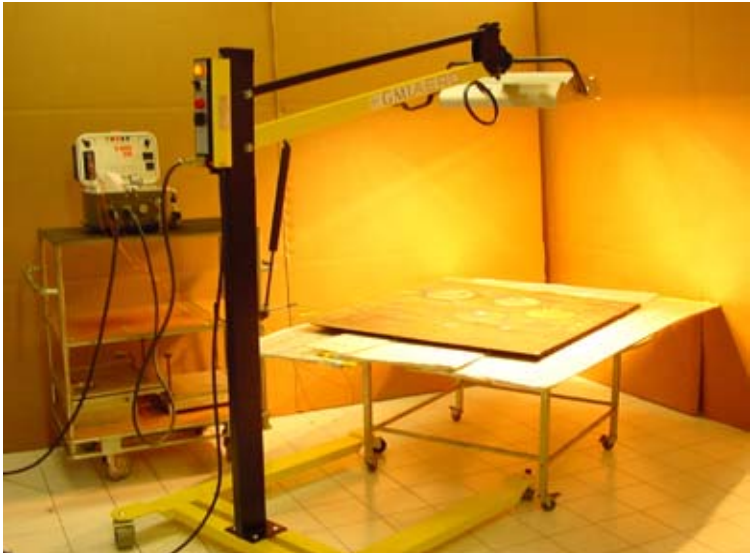
Please consult us for development and adaptation to your specific needs and application.

25 INFRA RED LAMPS AND SYSTEMS

GMI Aero offers a selection of INFRA RED equipment to meet a certain variety of use in a composite repair workshop.

- Curing composite repair patch with epoxy resin
- Drying resin
- Polymerization of paint and/or primer

HEATERS



25.1 PANEL WITH AN ARTICULATED ARM - LARGE AREA

This family of radiant panels regroups models mounted on articulated arms to ease the positioning above complex and large parts.

They are mainly used for paint, primers and small area curing of epoxies at low temperature (typically 120°C/250°F).



They are proposed mounted on an articulated arm, itself on a rolling assembly.

Its design features provide a large surface coverage with good temperature distribution

- a. One cassette with 3 infra-red emitters
- b. High life duration of emitters due to permanent ventilation
- c. Ventilation provides high security for the user
- d. 10000 hours life duration of emitters

We offer several variations for control:

- The panel can be controlled by Anita Bonding Console through direct connection like a heating blanket
- In optional addition, the system can be controlled by an independent Controller
- In another optional addition a 4 channels Thermocouple scanner can be added

| Item | P/N | Description | |
|-------|-------------|--|---|
| 25101 | GMIWIR-MA-2 | <p>The system in its basic version (230 Volts- 3KW) Large Curing area: 1 x 0,9 m (40 x 35 inches)</p> <p>Control With interface to Anita for automatic control 230 Volts- 3KW - Typically for heat up to 120 °C.</p> |  |
| 25102 | GMIWIR-MR-2 | <p>With Option to be attached to above system to control it independently of the Anita Bonding Console by a controller only, mounted on the vertical strut <i>Picture of controller box may be different</i></p> |  |

| Item | P/N | Description |
|-------|--------------|---|
| 25103 | GMIWIR-MRS-2 | The same as the previous one, but with a 4 thermocouples scanner Type J or K to be specified. <i>Picture of control box may be different</i> Note select J or K for type of thermocouple |
| 25104 | GMIWIRL-2 | Infra Red Spare Lamp 230 Volts |
| 25105 | GMIWIR-MF | Spare Filter |



25.2 INFRA RED SYSTEMS - SPOTBOND 1 AND 2
Articulated For Small And Larger Areas

| Item | P/N | Description |
|---|----------------|--|
| <p>An articulated head mounted on a vertical bar on a rolling base. With interface for direct control by an Anita EZ Bonding Console or optionally through a controller-scanner</p> | | |
| | | |
| 25201 | GMIWIR-SB1-A-2 | SpotBond 1, 1000 Watts - 1 lamp controllable by console Anita - 230 Volts (120V on request) |
| 25202 | GMIWIR-SB2-A-2 | SpotBond 2, 2000 Watts - 2 lamps controllable by console Anita - 230 Volts (120V on request) |
| 25203 | GMIWIR-SBL-1 | Infra Red Spare Lamp 120V |

| Item | P/N | Description |
|-------|--------------|---|
| 25204 | GMIWIR-SBC01 | Transportation case for the Spot Bond lamp only |



25.3 RADIANT PANELS TO BE POSITIONED ABOVE A PART

| Item | P/N | Description |
|-------|--------------------|---|
| 25301 | GMIWRP040040-1Z-V* | <p>Panel with ceramic radiant circuits</p> <p>Surface : for 40 x 40 cm Up to 120 /180°C With adaptable height legs To be controlled by Anita Console Other dimensions available</p> <p>*V = 120 or 230 Volts</p> |



26 FOLDABLE OVEN WITH HOT AIR FOR ANITA CONSOLES

| Item | P/N | Description |
|-------|--------------------------------------|---|
| 26001 | GMIETE110-V* | <p>A foldable oven for drying the sandwich area after core removal and before core installation or potting. The oven is useful to accelerate the potting curing; in some cases it can be used to heat the adhesive up to 120°C. Base of the oven 40x 40 cm The oven temperature cycle is controlled :</p> <ul style="list-style-type: none"> - Either by the ANITA Console. The oven is equipped with a specific heat gun. and an internal diffusion grid for gun air break. - Or by a controller scanner as proposed below <p>*V=1 for heat gun 120V *V=2 for heat gun 230V</p> |
| 26002 | GMIETE011-1 GMIETE011-2 | <p>Heat gun 120V Heat gun 230V</p> |
| 26003 | GMIETE012-V* | <p>Adaptator cable for Anita bonding console</p> <p>*V = 1 for 120V - US Plug *V=2 for 230V - CE Plug</p> |
| 26004 | GMISC04-J or GMISC04-K | <p>Aniscan Mini scanner - Curing Data Logger</p> <p>4 Thermocouple plugs, J or K according to needs</p> <p>Autonomous to register any heating process. USB plug to get the last cycle saved Can connect to a PC to exploit the data Ideal for independent IR system.</p> |



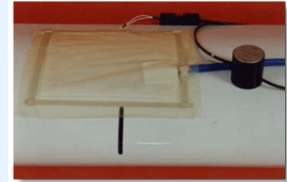
27 AUTONOMOUS HEATING BLANKETS AND CONTROLLERS

This specific family of blankets is conceived and manufactured for use at low temperature : around 80°C according to specs (it can exceptionally heat up to 100°C).

They are driven in power by specific simple low cost instruments that we call **Autonomous Bonders**.

Autonomous blankets

They are used as classical blankets but are limited to low temperature of max 80 °C.
They need the autonomous controller as below
Various sizes of blankets.



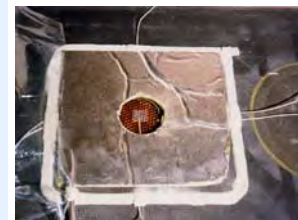
Controller for autonomous blankets

Preset at **60 or 80°C**



28 HEAT FLEXIBLE INSULATOR

| Item | P/N | Description |
|-------|----------|--|
| 28001 | GMITI010 | <p>Flexible Insulator</p> <p>This is used to protect areas from being overheated. It is an excellent insulator against heat losses by radiation and convection.</p> <p><u>Typical applications :</u></p> <ul style="list-style-type: none"> - Repair of elevator - Bonding an adhesive in bottom of hole in honeycomb. <p>Delivered in sheet of 45 x 75 cm <u>Note</u> : Can easily be cut with a cutter</p> |



28.1 AUTONOMOUS BLANKETS FLEXIBLE

| Item | P/N | Dimensions (cm) | Zones |
|-------|-----------------|-----------------|-------------------|
| 28101 | GMIHBA02020-V* | 20 X 20 | 1 electrical zone |
| 28102 | GMIHBA025025-V* | 25 X 25 | 1 electrical zone |
| 28103 | GMIHBA030030-V* | 30 X 30 | 1 electrical zone |
| 28104 | GMIHBA040040-V* | 40 X 40 | 1 electrical zone |
| 28105 | GMIHBA030050-V* | 30 X 50 | 1 electrical zone |
| 28106 | GMIHBA060060-V* | 60 X 60 | 1 electrical zone |

where *V =1 for 120 Volts ; V= 2 for 230 Volts - ask us for other dimensions

28.2 AUTONOMOUS BLANKETS STRETCHABLE

| Item | P/N | Dimensions (cm) | Zones |
|-------|------------------|-----------------|-------------------|
| 28201 | GMIHBAC020020-V* | 20 X 20 | 1 electrical zone |
| 28202 | GMIHBAC025025V* | 25 X 25 | 1 electrical zone |
| 28203 | GMIHBAC030030V* | 30 X 30 | 1 electrical zone |
| 28204 | GMIHBAC040040V* | 40 X 40 | 1 electrical zone |
| 28205 | GMIHBAC030050V* | 30 X 50 | 1 electrical zone |

where *V =1 for 120 Volts ; V= 2 for 230 Volts - ask us for other dimensions

28.3 AUTONOMOUS CONTROLLERS

| Item | P/N | Description |
|--|---------------|--|
| Controller Normal Power with 1 or 2 outputs in parallel Power max: Voltage X 7 Amp | | |
| 28301 | GMITH1-V*-60 | Preset at 60 °C/140°F 1 single output |
| 28302 | GMITH1-V*-80 | Preset at 80 °C/176°F 1 single output |
| 28303 | GMITH2-V*-60 | Preset at 60 °C/140°F 2 single output |
| 28304 | GMITH2B-V*-T* | Controller with High Power 2 output in parallel Power max: Volts x 16 A Temperature T= 60 or 80 (°C) |



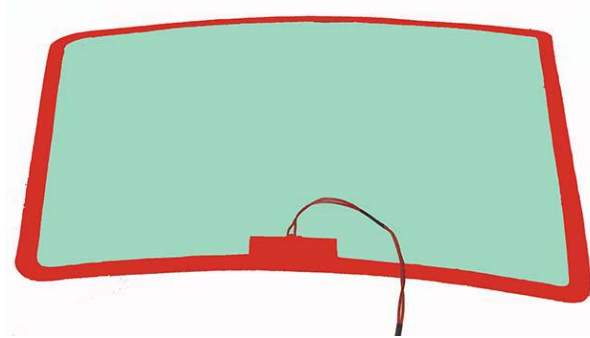
where *V =1 for 120 Volts ; V= 2 for 230 Volts

28.4 APPLICATIONS OF AUTONOMOUS SYSTEMS

28.4.1 DISBONDING OF WIND SCREEN

By softening of PR - Here below is an example of an application on a wind screen of an Embraer aircraft.

Consult us for application details.



28.5 BOEING 747 - KRUEGER AND CAMBER FLAP SEAL BONDING - HEATED HINGES

Heated hinges for flaps

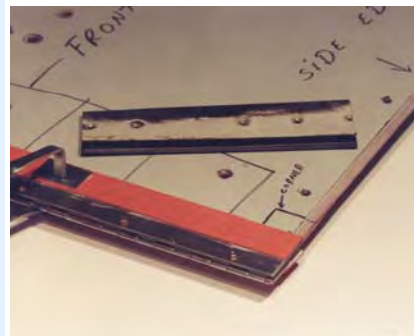
747 Krueger and Camber panels have bonded seals that tend to disbond with time. The panel has to be dismantled and a reinstallation of the seals is performed in a workshop. Up to now, this work was done at ambient temperature.

Our system cures the adhesive at **70°C / 158 °F**. Thanks to our innovative autonomous controller, the **operation is made easily without use of an external console**.

Curing at a higher temperature **reduces considerably the duration of the operation and enhances the quality of adhesion**.

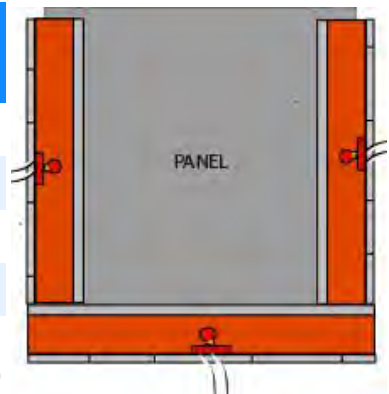
The product is :composed of 3 hinges: 1 for the longer side, and 2 identical ones for the shorter side.

The heating device is made according to the flap panels.



| Item | P/N | Panel Length mm/feet | Panel Width mm/feet |
|-------|--------------|----------------------|---------------------|
| 28501 | GMIFLP6400-V | 1850 / 6.08 | 570 / 1.87 |
| 28502 | GMIFLP6390-V | 2200 / 7.22 | 700 / 3.00 |
| 28503 | GMIFLP6410-V | 1930 / 6.33 | 700 / 3.00 |
| 28504 | GMIFLP3290-V | 2540 / 8.33 | 570 / 1.87 |


To control the flaps, use the autonomous controller at 70°C
P/N: GMITH3-70-V : where V = 1 for 120V ; and V = 2 for 230V (3 outputs)





(3) OTHER USEFUL COMPLEMENTARY TOOLS FOR BONDING

29 THERMOCOUPLE CABLES

29.1 THERMOCOUPLE CABLE ROLLS

| Item | P/N | Description |
|---|-------------|---|
| <p>Our thermocouple cable is of high quality and particularly suitable for the fabrication of individual cables for the sensing of temperature in composite vacuum bags. It is available in rolls and is sleeved with Kapton for easy manipulation and rolling. Its specifications are compatible with composite repair classes of measurement.</p> | | |
|  | | |
| 29101 | GMIANT150-J | A roll of 150 m of thermocouple cable Type J with limits of error ± 1.1 °C |
| 29102 | GMIANT150-K | A roll of 150 m of thermocouple cable Type K with limits of error ± 1.1 °C |
| 29103 | GMIANT300-J | A roll of 300 m of thermocouple cable Type J with limits of error ± 1.1 °C |
| 29104 | GMIANT300-K | A roll of 300 m of thermocouple cable Type K with limits of error ± 1.1 °C |

29.2 THERMOCOUPLE CABLE MOUNTED

| Item | P/N | Description |
|---|---------------|--|
| 29201 | GMIEZT010-J-3 | <p>1 Thermocouple cable checked and tested 3 meters long - Type J To be used for Anita with plugs J For calibration certificate see below With limits of error ± 1.2 °C</p> |
|  | | |
| 29202 | GMIEZT010-K-3 | <p>1 Thermocouple cable checked and tested 3 meters long - Type K To be used for Anita with plugs K for calibration certificate see below With limits of error ± 1.2 °C</p> |
|  | | |

Calibration Certificate

The cables are delivered with a conformance certificate. if you want also an individual certificate of calibration, we can supply at additional cost a certificate for each cable duly serialised. The cable is tested at 4 points : 40, 80, 120, 200 °C - see also below how to calibrate yourselves the thermocouple cables.

29.3 THERMOCOUPLE PLUGS & PANELS

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

Thermocouple Plugs

29301 GMIEZT010-1-J **Thermocouple plug set type J**
to be mounted for ambience below **180 °C**
(for higher temperature see below)



29302 GMIEZT010-1-K **Thermocouple plug set type K**
to be mounted for ambience below **180 °C**
(for higher temperature see below)



High Temperature : Fabrication Processes or Repair inside Oven / Autoclaves

29303 GMIEZT011-1-T* **Thermocouple plug set** of type J or K to specify for
ambience up to **260°C**

29304 GMIFBTP-H-6-T* **Thermocouple socket panel** for interior of oven
Up to 260 °C - **6 sockets**

29305 GMIFBTP-H-8-T* **Thermocouple socket panel** for interior of oven
Up to 260 °C - **8 sockets**

29306 GMIFBTP-H-12-T* **Thermocouple socket panel** for interior of oven
Up to 260 °C - **12 sockets**



* where T = J or K according of thermocouple type

Extension thermocouple pair cables

29307 GMIFBTEX-8-T* **Cable with pairs individually twisted ;**
- Mylar internal for shield
- Copper wire for ground connection for **8 pairs**



*T = type J or K

29308 GMIFBTEX-12-T* **Cable with pairs individually twisted ;**
- Mylar internal for shield
- Copper wire for ground connection for **12 pairs**

*T = type J or K




30 WELDER FOR THERMOCOUPLES

| Item | P/N | Description | |
|-------|-------------|---|---|
| 30001 | GMIAT100-V* | <p>Welder</p> <p>Portable instrument for welding thermocouple cables (type J or K)</p> <p>*V = 1 for 120 V *V= 2 for 230 V</p> |  |
| 30002 | GMIATAC020 | <p>High quality stripper to prepare the tip end of the cable before welding</p> |  |

THERMOCOUP

30.1 ANISCAN - MINI SCANNER

| Item | P/N | Description | |
|-------|------------------------------|---|---|
| 30101 | GMISC04-J or GMISC04-K | <p>Aniscan Mini scanner - Curing Data Logger</p> <p>4 Thermocouple plugs, J or K according to needs</p> <p>Autonomous to register any heating process. USB plug to get the last cycle saved Can connect to a PC to exploit the data Ideal for independent IR system.</p> |  |

30.2 CALIBRATION SYSTEM FOR THERMOCOUPLE CABLES

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

To verify and qualify the thermocouple cables with a precision of +/- 1°C - Composed of **3 units**

30201 GMIFC1000

Dry oven with heating source

Calibrated with a precision of +/- 1.5 °C
Portable instrument with documentation.
The calibration is made by comparison and to enhance the precision

A sensor and a thermometer of high precision are combined. Consult us for more info.



30202 GMINGT550

A thermometer for reference with a precision better than +/-0,5°C



30203 GMINGT550-010

A sensor of high precision to measure the heating error.

31 STSM - SMART TEMPERATURE SENSING MATS WITH THERMOCOUPLES

Our Sensing Mat (STSM) is an innovative tool that will answer to the operator question as to where to position thermocouples for temperature control when performing hot bonding. The STSM is a layer of silicone embedded with very thin thermocouples according to a pre-set lattice. When laid between the patch and the blanket, the sensors will be in intimate contact with the optimized areas of the repair patch and will measure adequately the temperature of the patch to be bonded in place. According to the size and shape of the patch, the operator has the latitude to select the sensors that will participate to the control and to the monitoring of the cure cycle.



THERMOCOUP

According to the size the mat contains 6 or 12 thermocouples of type J or K to be selected at the order. The mat connects through a quick connector to a prolongator cable that is then connected to the Anita Bonding Console.

31.1 STANDARDS SENSING MATS

| Item | P/N | Description | Thermocouples |
|-------|--------------------|----------------------|----------------------------------|
| 31101 | GMISM-030030-6-T* | Smart Mat 30 x 30 cm | 6 Thermocouples |
| 31102 | GMISM-040040-6-T* | Smart Mat 40 x 40 cm | 6 Thermocouples |
| 31103 | GMISM-050050-6-T* | Smart Mat 50 x 50 cm | 6 Thermocouples |
| 31104 | GMISM-060060-6-T* | Smart Mat 60 x 60 cm | 6 Thermocouples |
| 31105 | GMISM-060060-12-T* | Smart Mat 60 x 60 cm | 12 - 2 output of 6 Thermocouples |
| 31106 | GMISM-070070-12-T* | Smart Mat 70 x 70 cm | 12 - 2 output of 6 Thermocouples |
| 31107 | GMISM-090090-12-T* | Smart Mat 90 x 90 cm | 12 - 2 output of 6 Thermocouples |


*T= J or K according to choice.
 Note that the large mats of 12 thermocouples need two thermocouples prolongator cables of 6 thermocouples to connect to the Anita console

31.2 PROLONGATOR CABLES

| Item | P/N | Description | Number of TC |
|-------|---------------|---|--------------|
| 31201 | GMIHBSM-6-J-3 | Prolongator cable of 6 couples of type J - 3 m long | 6 type J |
| 31202 | GMIHBSM-6-K-3 | Prolongator cable of 6 couples of type K - 3 m long | 6 type K |

(4) VACUUM GENERATION

32 COMPRESSED AIR PUMP - VENTURI

| Item | P/N | Description | |
|-------|-------------|--|---|
| 32001 | GMIOTPVV010 | <p>Vacuum bag valve monted with Venturi Pump To be easily mounted on the vacuum bag. Excellent flow. Delivered with: - Silencer - Standard Staubli connector Male (RBE06)</p> |  |
| 32002 | GMIOTPVV110 | Same as above, including a Tuning Valve | |
| 32003 | GMIOTPVV011 | <p>Vacuum bag valve monted with Venturi Pump To be easily mounted on the vacuum bag. Excellent flow. Delivered with: - Silencer - US connector Male atlas Copco (ISO 6150 B)</p> | |
| 32004 | GMIOTPVV111 | Same as above, including a Tuning Valve | |

VACUUM

33 ELECTRICAL VACUUM PUMPS

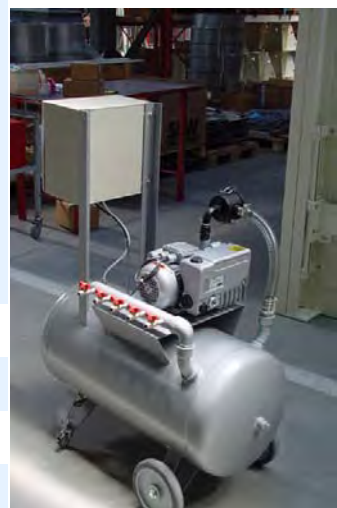
33.1 LIGHT PORTABLE PUMPS

| Item | P/N | Description |
|-------|--------------|--|
| 33101 | GMIWVP011-V* | <p>Electrical Vacuum Pump Monovoltage</p> <ul style="list-style-type: none"> - For 1 or 2 vacuum bags. - Small and light (9 Kg) - No oil - *V= 1 for 120V and V=2 for 230 V <p>Comes complete with a manometer and vacuum silicone hose - option of transportation case available</p> |
| 33102 | GMIWVP021 | <p>Electrical Vacuum Pump BiVoltage</p> <ul style="list-style-type: none"> - For 1 or 2 vacuum bags. - Small and light (9 Kg) - No oil - Automatic Switching from 120V to 230V (cable to change) <p>Comes complete with a manometer and vacuum silicone hose.</p> |
| 33103 | GMIWVPC011 | <p>Transport case for the vacuum pumps above</p> <p><u>Note:</u> the color of the case may change</p> |



33.2 MOBILE VACUUM CENTERS FOR WORKSHOP

| Item | P/N | Description |
|-------|-----------|--|
| 33201 | | <p>System with oil vacuum pump and tank</p> <p>Mounted on rolls. Ready for simultaneous connection of 5 vacuum bags</p> <ul style="list-style-type: none"> - 2 tank capacities: 16 & 25 M³/H - Voltage versions : <ul style="list-style-type: none"> • 230V monophase • 380 V three phases |
| 33202 | GMIWVR011 | Capacity 16 M ³ /h - monophase 230 Volts |
| 33203 | GMIWVR012 | Capacity 16 M ³ /h - 3 phases 380 Volts |
| 33204 | GMIWVR013 | Capacity 25 M ³ /h - monophase 230 Volts |
| 33205 | GMIWVR014 | Capacity 25 M ³ /h - 3 phases 380 Volts |



34 VACUUM HOSE - VALVES - CONNECTIONS

All parts described in this chapter are for use with our bonding systems for composite repair. Thermocouple cables, vacuum hoses, valves to be used inside autoclaves and ovens are listed in the Workshop Chapter.




34.0.1 VACUUM VALVES

We can offer several types of valves according to standard of connection.









| Item | P/N | Description | |
|-------|------------------------------|--|---|
| 34011 | GMIWVB010 | Vacuum Bag Valve with : - Valve Base Diameter 65 mm - Auto Closing Part with its nipple to receive the mobile part below - US Style |  |
| 34012 | GMIWVB020 | Vacuum Bag Valve with : - Base Diameter 50 mm - Auto Closing Part with its nipple to receive the mobile part below - US Style | |
| 34013 | GMIWVB011 | Mating connector for valve above With connector for insertion in vacuum hose of internal diameter of 8 mm |  |
| 34014 | GMIWVB010-01 GMIWVB010-02 | Vacuum Bag Valve Base - Diam 65 mm - Diam 50 mm |  |
| 34015 | GMIWVB010-03 | Auto closing part To be mounted on Vacuum Bag Valve Base |  |
| 34016 | GMIWVB010-04 | Connection for insertion in flexible hose - Diameter 8 mm - Thread 1/4 Gas |  |
| 34017 | GMIWVB012 | Vacuum Bag Valve with : - Base Diameter 65 mm - Auto Closing Part when the tube is unplugged - Connector Staubli Type (GMIEZP121) |  |
| 34018 | GMIWVB013 | Vacuum Bag Valve with : - Base Diameter 50 mm - Auto Closing Part when the tube is unplugged - Connector Staubli Type (GMIEZP121) | |
| 34019 | GMIEZP060-02 | Vacuum Sniffer to be inserted tangentially to the repair bag wherever this is useful and/or necessary Compatible with Anita vacuum hoses of internal diameter. of 8 mm |  |

VACUUM

34.1 VACUUM SENSING VALVES

| Item | P/N | Description | |
|-------|------------------------|---|--|
| 34101 | GMIOTP010 GMIOTP030 | <p>Vacuum Hose</p> <p>A roll of 10 m A roll of 30 m</p> <p>Red silicone tube for vacuum bag; compatible with Anita connections Internal diam : 8mm</p> |  |
| 34102 | GMIOTPV010 | <p>Vacuum meter mounted on connector to mate the valve base GMIWVB010</p> |  |
| 34103 | GMIOTPV012 | <p>Vacuum meter mounted on connection to mate the valve base GMIWVB012</p> |  |

34.2 CONNECTIONS

| Item | P/N | Description | |
|-------|--------------|---|---|
| 34201 | GMIOE013 | Y connection to for 2 bags to a vacuum pump: - Staubli output (RBE06) - Connexion Staubli male for 6 mm tube |  |
| 34202 | GMIEZP060-1 | Staubli Male connector (RBE06) - For insertion in hose of interior diam of 8 mm . Compatible with Anita connections or to the Y above |  |
| 34203 | GMIEZP060-2 | Staubli Male connector (RBE06) - For insertion in hose of interior diam of 6 mm . Compatible with Anita connections or to the Y above |  |
| 34204 | GMIEZP021 | Staubli Female connector (RBE06) - For insertion in hose of interior diam of 6 mm |  |
| 34205 | GMIEZP121 | Staubli connector Female - Female(RBE06) Thread 1/4 NPT |  |
| 34206 | GMIEZP020-02 | Staubli connector Male - Male (RBE06) Thread 1/4 Gas |  |
| 34207 | GMIEZP020-04 | Staubli connector Male - Female (RBE06) Thread 1/4 Gas |  |
| 34208 | GMIEZP020-03 | Atlas Copco connector Male - Male (ISO 6150B) Thread 1/4 NPT |  |

VACUUM

34.2.1 VACUUM LEAK TEST

| Item | P/N | Description |
|-------|-----------|--|
| 34211 | GMIWLD010 | To help locating the source of the leak in a vacuum bag. |



(5) TOOLINGS

35 LESLIE KITS WITH GMI INNOVATIVE TOOLS

It is a unique equipment developed by GMI since twenty years ago and sold regularly worldwide to all customers who want to machine the composite structures according to the state of the art rules. Include innovative tools unequalled for performances in stepping, scarfing, milling, routing, edging... laminate or sandwich structures with flat, curved or multi curved surface skins.



Three models are offered

WORKSHOP : Model with our innovative tools and a selection of accessories useful and necessary for an on-site operation. It's made so that ideally you have all necessary items to perform a repair within one box.

CRT : Model restricted to our innovative tools for development work in your entity. This model is more for constructors, schools etc.

KSS : Model restricted to 3 of our innovative tools for machining and sanding of part.

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

| | | |
|-------|----------------|---|
| 35001 | GMIAT87B02-320 | <p>Leslie Workshop Model</p> <p>Mobile Workshop with innovative tools and attachments and useful accessories to prepare the structure before repair Contains all parts to conduct a repair from paint removal to patch installation see specifications details in annexes.</p> |
|-------|----------------|---|



| | | |
|-------|------------|---|
| 35002 | GMICRT9201 | <p>Leslie Model CRT</p> <p>Restricted kit from above with innovative tools and attachments For manufacturers, repair centres, universities</p> |
|-------|------------|---|



| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

| | | |
|-------|-----------|---|
| 35003 | GMIKSS010 | <p>Leslie Model KSS</p> <p>This restricted kit of Leslie contains only 3 innovative tools. This version is suitable for small workshops or customers working on non-complex structures.</p> <p>The tools provided will allow you to do both stepping and scarfing.</p> |
|-------|-----------|---|



Option for all three Leslie Kits :

- **Foldable oven** (40 x 40cm) to dry the sandwich area after core removal and before core installation or potting. The oven is useful to accelerate the potting curing. Can heat up to 120°C.
- **Heating Gun**
- **Internal diffusion grid** for gun air break
- Cable to connect to the Anita Console is included





| | | |
|-------|----------------------------|--|
| 35004 | GMIETE010 | Foldable oven and diffusion grid |
| 35005 | GMIETE011-1 GMIETE011-2 | Heat gun 120V Heat gun 230V |
| 35006 | GMIOTE012-V* | <p>Adaptator cable for Anita bonding console</p> <p>*V = 1 for 120V - US Plug *V=2 for 230V - CE Plug</p> |




36 DRILLING

36.1 DRILLING MACHINE


| Item | P/N | Description | |
|-------|-----------|---|---|
| 36101 | GMIWTD010 | Drilling Machine Straight for carbon skins to be used with our drill reamers below. |  |
| 36102 | GMIWTD011 | Drilling Machine In Angle for carbon skins to be used with our drill reamers below. |  |

36.2 DRILL REAMER HIGH QUALITY FOR CARBON SKINS

These drill perform 2 operations at the same time: drilling and reaming. They are conceived for a high quality operation on carbon skins - other dimensions in inches or mm are available.

| Item | P/N | Diameter | |
|-------|------------|----------|--|
| 3621 | GMICDR0396 | 3,96 |  |
| 3622 | GMICDR0410 | 4,10 | |
| 3623 | GMICDR0475 | 4,75 | |
| 3624 | GMICDR0480 | 4,80 | |
| 3625 | GMICDR0490 | 4,90 | |
| 3626 | GMICDR0508 | 5,08 | |
| 3627 | GMICDR0520 | 5,20 | |
| 3628 | GMICDR0627 | 6,27 | |
| 3629 | GMICDR0635 | 6,35 | |
| 36210 | GMICDR0650 | 6,50 | |
| 36211 | GMICDR0667 | 6,67 | |

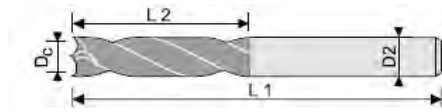
36.3 DRILL STOPS

| Item | P/N | Description | |
|-------|----------|-----------------|---|
| 36301 | GMIDRS02 | Drill Stops #40 |  |
| 36302 | GMIDRS03 | Drill Stops #30 | |
| 36303 | GMIDRS04 | Drill Stops #21 | |
| 36304 | GMIDRS05 | Drill Stops #11 | |
| 36305 | GMIDRS06 | Drill Stops #14 | |

TOOLINGS

36.4 DRILLS FOR KEVLAR SKINS

| Item | P/N | Diam mm (in) | L1 mm | L2 mm |
|------|-----|--------------|-------|-------|
|------|-----|--------------|-------|-------|



| | | | | |
|--------|------------|-----------------|-------|-------|
| 36401 | GMIKDR0300 | 3,00 mm | 40 mm | 12 mm |
| 36402 | GMIKDR0317 | 3,17 mm (1/8") | 40 mm | 12 mm |
| 36403 | GMIKDR0400 | 4,00 mm | 55 mm | 18 mm |
| 36404 | GMIKDR0476 | 4,76 mm | 58 mm | 24 mm |
| 36405 | GMIKDR0500 | 5,00 mm | 62 mm | 26 mm |
| 36406 | GMIKDR0555 | 5,55 mm (7/32") | 66 mm | 28 mm |
| 36407 | GMIKDR0600 | 6,00 mm | 66 mm | 28 mm |
| 36408 | GMIKDR0635 | 6,35 mm (1/4") | 70 mm | 31 mm |
| 36409 | GMIKDR0650 | 6,50 mm | 70 mm | 31 mm |
| 364010 | GMIKDR0700 | 7,00 mm | 74 mm | 34 mm |
| 364011 | GMIKDR0793 | 7,93 mm (5/19") | 79 mm | 37 mm |
| 364012 | GMIKDR0800 | 8,00 mm | 78 mm | 37 mm |

36.5 CORE DRILLS

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

Core Drills Diamond Coated GRID **D40** (thin for carbon skins)

| | | |
|-------|----------|--------------|
| 36501 | GMIT4003 | Ø 3/8 inch |
| 36502 | GMIT4005 | Ø 1/2 inch |
| 36503 | GMIT4007 | Ø 3/4 inch |
| 36504 | GMIT4009 | Ø 1 inch |
| 36505 | GMIT4011 | Ø 1+1/4 inch |
| 36506 | GMIT4013 | Ø 1+1/2 inch |
| 36507 | GMIT4015 | Ø 2 inches |



For pilot guide consult us

36.6 ROUTER BITS

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

| | | |
|-------|----------|--|
| 36601 | GMIOE030 | Router Carbide for Carbon 6 mm diam For carbon skins neatly with no risk of delamination |
|-------|----------|--|



| | | |
|-------|----------|---|
| 36602 | GMIOE031 | Router Carbide for Kevlar 6.35 mm diam Multi lips to avoid delamination |
|-------|----------|---|



36.7 DIAMOND CONES

| Item | P/N | Description |
|-------|------------|------------------|
| 36701 | GMIOEDC060 | 60° - axis 6 mm |
| 36702 | GMIOEDC100 | 100° - axis 6 mm |
| 36703 | GMIOEDC120 | 120° - axis 6 mm |
| 36704 | GMIOEDC130 | 130° - axis 6 mm |



36.8 TEETH COUNTERSINKS WITH REMOVABLE PILOT

36.8.1 FOR CARBON

| Item | P/N | Diameter (mm) |
|---|------------|---------------|
| Countersink with removable pilot (2 or 3 lips) at 100° for Carbone ; Thread M6 x 100 | | |
| 36811 | GMICSK0400 | Ø 4,00 |
| 36812 | GMICSK0476 | Ø 4,76 |
| 36813 | GMICSK0635 | Ø 6,35 |



For other products please consult us

36.8.2 FOR KEVLAR

| Item | P/N | Diameter (mm) |
|--|------------|---------------|
| Countersink with removable pilot (2 or 3 lips) at 100° for Kevlar according to diameters | | |
| 36821 | GMIKSK0400 | Ø 4,00 |
| 36822 | GMIKSK0477 | Ø 4,77 |
| 36823 | GMIKSK0635 | Ø 6,35 |



For other products please consult us

36.9 MICROSTOP DRILL CAGES

| Item | P/N | Description |
|--|----------|--------------------------|
| To perform chamfer in metal or in carbon with great precision | | |
| 36901 | GMIMDC06 | Diameter 6 mm - M6 x 100 |
| 36902 | GMIMDC08 | Diameter 8 mm - M8 x 100 |



For other products please consult us

SANDING

36.10 DIAMOND FILES

| Item | P/N | Description | Diamond Grit |
|--------|-----------|---|--------------|
| 361001 | GMILID060 | File length 150 mm - abrasive length 100 mm | Medium |
| 361002 | GMILID100 | File length 150 mm - abrasive length 100 mm | Fine |
| 361003 | GMILID160 | File length 250 mm - abrasive length 150 mm | Medium |
| 361004 | GMILID200 | File length 250 mm - abrasive length 150 mm | Fine |

37 SANDING

37.1 SANDING DISCS



| Item | P/N (box of 100 pieces) | Diameter in / mm | Grit |
|--------|-------------------------|------------------|------|
| 37101 | GMIAC041-080 | 1 in / 25 mm | 80 |
| 37102 | GMIAC041-120 | 1 in / 25 mm | 120 |
| 37103 | GMIAC041-180 | 1 in / 25 mm | 180 |
| 37104 | GMIAC041-240 | 1 in / 25 mm | 240 |
| 37105 | GMIAC041-320 | 1 in / 25 mm | 320 |
| 37106 | GMIAC042-080 | 2 in / 50 mm | 80 |
| 37107 | GMIAC042-120 | 2 in / 50 mm | 120 |
| 37108 | GMIAC042-180 | 2 in / 50 mm | 180 |
| 37109 | GMIAC042-240 | 2 in / 50 mm | 240 |
| 371010 | GMIAC042-320 | 2 in / 50 mm | 320 |
| 371011 | GMIAC043-080 | 3 in / 75 mm | 80 |
| 371012 | GMIAC043-120 | 3 in / 75 mm | 120 |
| 371013 | GMIAC043-180 | 3 in / 75 mm | 180 |
| 371014 | GMIAC043-240 | 3 in / 75 mm | 240 |
| 371015 | GMIAC043-320 | 3 in / 75 mm | 320 |

37.2 MANDRELS

| Item | P/N | Diameter |
|-------|----------|--------------|
| 37201 | GMIAC041 | 1 in / 25mm |
| 37202 | GMIAC042 | 2 in / 50 mm |
| 37203 | GMIAC043 | 3 in / 75 mm |

Mandrels for sanding discs above - medium hardness - see picture for principle of mounting



37.3 ABRASIVE CYLINDERS AND SUPPORTS

| Mandrels | | | |
|----------|------------|----------|--------|
| P/N | Dim (mm) | Dim (mm) | |
| 37301 | GMIMA01510 | 15 x 10 | 6 x 35 |
| 37302 | GMIMA01530 | 15 x 30 | 6 x 35 |
| 37303 | GMIMA01925 | 19 x 25 | 6 x 35 |
| 37304 | GMIMA02220 | 22 x 20 | 6 x 35 |
| 37305 | GMIMA02525 | 25 x 25 | 6 x 35 |
| 37306 | GMIMA03020 | 30 x 20 | 6 x 35 |
| 37307 | GMIMA03030 | 30 x 30 | 6 x 35 |



TOOLINGS

| Cylinders in box of 100 pieces | | | | |
|--------------------------------|------------|---------------|---------------|---------------|
| | D x T (mm) | Grain 80 | Grain 150 | Grain 240 |
| 37308 | 15 x 10 | GMICA1510-080 | GMICA1510-150 | GMICA1530-240 |
| 37309 | 15 x 30 | GMICA1530-080 | GMICA1530-150 | GMICA1925-240 |
| 373010 | 19 x 25 | GMICA1925-080 | GMICA1925-150 | |
| 373011 | 22 x 20 | GMICA2220-080 | GMICA2220-150 | |
| 373012 | 25 x 25 | GMICA2525-080 | GMICA2525-150 | |
| 373013 | 30 x 20 | GMICA3020-080 | GMICA3020-150 | |
| 373014 | 30 x 30 | GMICA3030-080 | GMICA3030-150 | |



38 SCISSORS

| Item | P/N | Description |
|-------|----------|---|
| 38001 | GMIAC017 | Standard Scissors For papers or others Length : 24cm |
| 38002 | GMIAC018 | High Quality Scissors with microteeth For <u>Kevlar</u> , <u>Carbon</u> and dry fabric. |
| 38003 | GMIAC019 | Electrical scissors For <u>Glass fiber</u> , <u>Carbon</u> or <u>Kevlar</u> (max 175g/m ²) Delivered in a box with accessories <u>Note</u> : Not for prepregs |



39 TOOLINGS FOR SEALANTS AND PR TREATMENT

39.1 VIBRATING CHISEL AND SPECIAL BLADES FOR SEALANT REMOVAL

For this activity, GMI has developed:

- a) Tools designed specifically to remove sealants, PRC, Silicones, glues, RTV, seals, gaskets and all general mastic.(see below)
- b) Instrument to accelerate the hardening of the PR with temperature control

| Item | P/N | Description |
|-------|---------|---|
| 39101 | GMIVG01 | One System Chisel with its Case Complete Kit containing: - Padded leather case for onboard operation - Medium CHISEL - VIBRO-BLADE dustless Sharpener of blades with aggregate disc for sharpener and vacuum bags. - A number of sample blades |



| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

39102 GMIVG01-01 **Vibrating chisel**



39103 GMIBS010 **Chisel Blade** sharpening wheel in a portable case

(Delivered without the chisel)



Consumable for sharpening machine

39104 GMIVGBG10 Package of 10 Dustless Vacuum Bags for sharpening case

39105 GMIVGR10 Package of 10 aggregate rings for sharpening case

Other Presentations possible for the Chisel

39106 GMIVG01-11 Kit of **Medium Chisel** with:
- 5m Anti static hose
- Set of 20 blades for **soft metal**



39107 GMIVG02 Kit of **High Power Chisel** with:
- 5m Anti static hose
- Set of 20 blades for **soft metal**

39108 GMIVG02-02 **High power** chisel for thick coat of sealants



Kits of Blades

39109 GMIVGH06 **Hand Kit for Mastic Removal**
- Box of 6 mixed blades
• 3 for soft T3 aluminium
• 3 for hard metal
- Handle for easy manipulation



391010 GMIVGH06-T3 **Hand Kit for Mastic Removal**
- Box of 6 blades for soft T3 aluminium
- Handle for easy manipulation

391011 GMIVGH06-H **Hand Kit for Mastic Removal**
- Box of 6 blades for hard metal
- Handle for easy manipulation



| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

Other useful items for mastic removal

391012 GMIVGSH15 **Anti Static Hose (Roll of 15m)**

 Recommended when working inside the aircraft.
 To compress air power to the vibrating chisel
 Assembled with conductive connectors



391013 GMIAP03 **Angle Polisher For T3 Aluminium**



391014 GMIAP03-F03 **Compound impregnated discs for angle polisher**

 Specific for T3 aluminium
 Come in bags of 3 discs



(6)INSTRUMENTS FOR NON DESTRUCTIVE TESTS - NDT

40 TAP-TAP

| Item | P/N | Description |
|-------|----------|--|
| 40001 | GMIUC226 | Tap tap aluminium for sandwich and thin skin |
| 40002 | GMIUC227 | Tap tap steel for laminate panels with thick skins |
| 40003 | GMIUC228 | Other model in aluminium |



41 ELISA ULTRASONIC CONSOLE KIT FOR COMPOSITE REPAIR

| Item | P/N | Description |
|-------|------------------|---|
| 41001 | GMIUCS87B02- VFT | <p>ELISA Ultrasonic Kit (NDT)</p> <p>Ultrasonic instrument set developed for composite repair context. With easy operation to be used by technicians in charge of composite repair</p> <p>Delivered with</p> <ul style="list-style-type: none"> - dialogue and display Laptop - an A-Scan simple interface small box - two probes for carbon test - a set of accessories - in a nice transportable case - A manual for use and composite damage assessment procedure |



NDT

42 SPECIMENS FOR THICKNESS CALIBRATION

| Item | P/N | Description |
|-------|-------------|---|
| 42001 | GMIUCTS2010 | Set of carbon thickness specimens; fabric and tape various thicknesses The kit composed of: |
| | GMIUCTS-11 | a) Specimens of Carbon Tape: 11 specimens of thickness in terms of plies: 4, 6, 8, 12, 16, 24, 32, 48, 64, 72, 96. |
| | GMIUCTS-7 | b) Specimens of Carbon Fabric: 7 specimens of thickness in terms of plies: 2, 3, 4, 6, 8, 12, 16 plies |
| | | Each sample with 4 presentations of carbon, carbon + bronze mesh, + primer + paint |
| 42002 | GMIUCT72-5 | Set of 5 specimens for laminated Tape Thicknesses: 96, 64, 32, 16 & 8 Application to ATR72 wing panel inspection |
| 42003 | GMIUCF72-7 | Set of 7 specimens for laminated Fabric Thicknesses : 2, 3, 4, 6, 8, 12, 16 |



43 HUMIDITY PRESENCE METER FOR RADOME

| Item | P/N | Description |
|-------|-----------|---|
| 43001 | GMIRMD012 | Direct Reading Colored Comparator Scale - for instantaneous indication of moisture; spring loaded electrode-buttons to adapt to curved surfaces. Rechargeable Ni-Cad Battery - eliminates costly battery replacement. 230V Carrying Case, Charging Cord, Manual Included |



44 THERMOGRAPHY KITS FOR AIRBUS ELEVATORS

| Item | P/N | Description | |
|---|----------------|---|--|
| <p>Heating Blankets to perform thermography NDT for the detection of water ingress in Airbus Elevators (A300, A320, A330, A340)</p> <p>Each Kit is delivered in a case for easy storage and safe transportation and is conform to the specifications and methodology as developed in agreement with Airbus NDT.</p> | |  | |
| 44001 | GMIDS00HK010-2 | | Kit For A300-600 - 6 blankets in a kit |
| 44002 | GMIDS32HK010-2 | | Kit For A320 - 3 blankets in a kit |
| 44003 | GMIDS34HK010-2 | | Kit For A340 - 6 blankets in a kit |
| 44004 | GMIDS34CK010-2 | | Controller with all its accessories delivered in a case for easy storage and safe transportation |
| <p>Each kit conform to the specifications and methodology as developed in agreement with Airbus NDT.</p> | |  | |
| 44005 | GMIDS34TK010-2 | | Transformer with all its accessories delivered in a case for easy storage and safe transportation |
| <p>This equipment transforms 120V power into 230V.</p> | |  | |
| GMIDS34IC010 | | | Infra Red Camera high performances for water ingress detection in elevators. |
| <p>Picture depending of model at the time</p> | |  | |

NDT

(7) SPECIFIC REPAIR APPLICATIONS

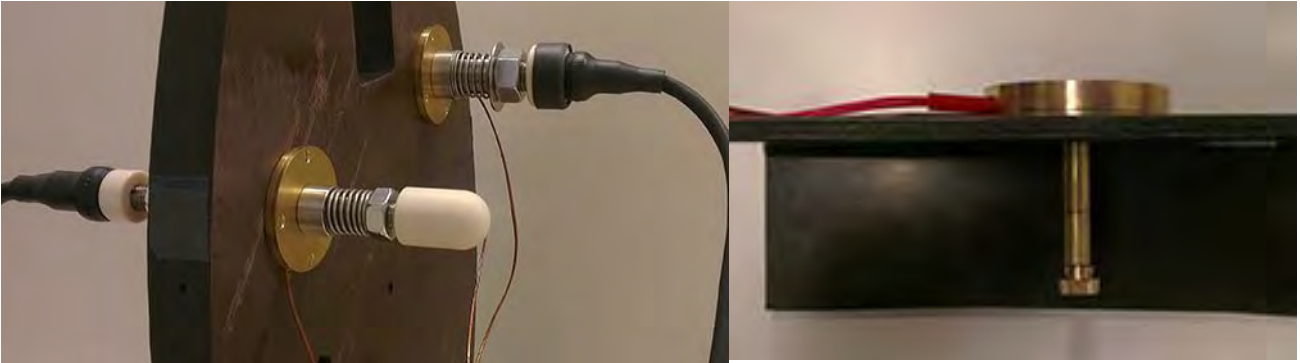
We present here solutions developed for specific maintenance issues or particular repair processes.

§: 45 - REPAIR OF DRILLED HOLES - PAGE: 68

§: 46 - PR HARDENING OR SOFTENING - PAGE: 71

§: 47 - REPAIR OF INFLATING SYSTEMS - SAMANTHA - PAGE: 73

§: 48 - TEST OF DE-ICER BOOTS FOR REGIONAL COMMUTERS - PAGE: 74

45 REPAIR OF DRILLED HOLES

During drilling operations on composite laminate parts, damages can occur either at the entrance of the drill, at the exit or internally. The Heating Bolt Solution has been developed to provide heat for curing the resin applied to repair these damages; compaction can be also mechanically generated. Inserted in the hole, the tool provides heat to raise the temperature at the periphery of the hole and in a localized area on the two in /out skins at a programmed temperature up to 120°C . To control the process, specific electric and electronic interfaces with advanced programmable software have been developed.

This tooling solution has been developed in order to provide a localised heating for curing the applied resin inside holes to repair damages possibly associated with the drilling and reaming operations on a carbon laminate.

45.1 HEATING TOOL RANGE : PINS AND BOLTS

A set of specifically designed tools have been conceived to deal with the variety of cases possibly met in this activity according to the diameter of the holes and of the thickness of parts. We have treated a large extent of cases described in the tables of the following paragraphs. We offer solutions for small holes below 6 mm and above.

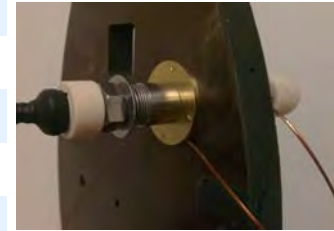
- a) Below a hole diameter of 6 mm, we offer **PIN** solutions.
- b) Above 6 mm, we offer **BOLT** Solutions.

All tools include possibility of temperature control by 3 thermocouples type J or K by our console ANITA EZ.

Our offer also include an integrated controller for up to 6 devices, specially designed for aircraft assembly line.

45.2 HEATING BOLTS

| Item | P/N | Hole diameter (mm) |
|-------|----------------|--------------------|
| 45201 | GMICB102-T*-V* | 10,2 |
| 45202 | GMICB111-T*-V* | 11,1 |
| 45203 | GMICB127-T*-V* | 12,7 |
| 45204 | GMICB159-T*-V* | 15,9 |
| 45205 | GMICB191-T*-V* | 19,1 |



*V= 1 for 120 Volts; V= 2 for 230 Volts

*T is the type of thermocouples = J or K

45.3 HEATING WASHERS

| Item | P/N | External Diameter | Internal Diameter |
|------|-----|-------------------|-------------------|
|------|-----|-------------------|-------------------|

For the same type of work, heating washers are also of interest.

Typical : 50 mm external diameter; central hole diam. 5,0mm; with 3 thermocouples type J or K to be defined
See below a model frequently used with different internal diameter

| | | | |
|------|---------------|-------|---------|
| 4531 | GMIHW50032-T* | 50 mm | 3,2 mm |
| 4532 | GMIHW50048-T* | 50 mm | 4,8 mm |
| 4533 | GMIHW50050-T* | 50 mm | 5,0 mm |
| 4534 | GMIHW50056-T* | 50 mm | 5,6 mm |
| 4535 | GMIHW50060-T* | 50 mm | 6,0 mm |
| 4536 | GMIHW50064-T* | 50 mm | 6,35 mm |
| 4537 | GMIHW50070-T* | 50 mm | 7,0 mm |
| 4538 | GMIHW50080-T* | 50 mm | 8,0 mm |



* T = J or K according to the type of thermocouples

Other dimensions upon request

Note : these parts are under 24 Volts and are either for use under 120 or 230 Volts through the use of the interface described in the next chapters.

45.4 HEATING PLATES

| Item | P/N | Length | Width |
|------|-----------------|--------|--------------|
| 4541 | GMIHP050070-T* | 50mm | 70 mm |
| 4542 | GMIHP070100- T* | 100mm | 70 mm |

Other dimensions upon request

These plates are under 24 Volts ; controllable as explained below see §: 45.5 - temperature control for pins and washers or bolts - Page: 70

45.5 TEMPERATURE CONTROL FOR PINS AND WASHERS OR BOLTS

Two possibilities :

- a) Either by a console Anita EZ ; one or two heating tools in parallel
- b) For up to 6 heating tools in parallel

45.5.1 TEMPERATURE CONTROL INTERFACE FOR ANITA EZ

| Item | P/N | Description |
|--|------------|---|
| To control a bolt , a washer or a heating plate (24 Volts) with an Anita EZ bonding Console an interface is needed. | | |
| 45511 | GMICTE1-EZ | Interface 1 Zone for an Anita Console 1 PIN only can be connected |
| 45512 | GMICTE2-EZ | Interface 2 Zones for an Anita Console 2 PINS can be connected |



For Bolts, no interface is needed ; connect it to the Anita directly

45.5.2 ANIBOLT - INTEGRATED CONTROLLER FOR 6 BOLTS, WASHERS, OR PLATES

| Item | P/N | Description |
|--|-----------|---|
| 45521 | GMIAB6Z01 | Anibolt - Temperature Controller |
| <p>Characteristics:</p> <ul style="list-style-type: none"> - Control up to 6 bolts, pins or washers independently - 3 thermocouples per zone (18 in total) - Dimensions: mm - Weight 9 Kg - Total Power 6000 Watts - Anitalk PC software for programming - USB port for reporting - Delivered complete with its accessory case | | |



46 PR HARDENING OR SOFTENING

46.1 **APRIL** CONSOLE FOR SEALANT HARDENING PROCESS

| Item | P/N | Description |
|-------|-------------|--|
| 46101 | GMIAPR-3Z-X | <p>Code Name: APRIL - 3 Zone control</p> <p>This console has been conceived specially for providing heat generation at a very low rate specially appropriate for PR</p> <p>More , it can also control heat distribution on small or very large areas (several square meters) with temperature control with very fine tuning</p> <p>The heating blanket connected can be designed specifically in shape and dimensions. The console can drive a blanket with 3 differentiated areas.</p> |



46.2 **APRIL** CONSOLE FOR FABRICATION HEATING PROCESSES
 APPROPRIATE FOR STRINGER FABRICATION RELATED HEATING CYCLES

| Item | P/N | Description |
|-------|-------------|---|
| 46201 | GMIAPF-3Z-T | <p>Code Name: APRIL 3Z</p> <p>This console answers to a frequent need in Composite Fabrication Workshop where several heating cycles have to be controlled in parallel with simplicity of administration and offering full traceability.</p> <p>3 Cycles in parallel.</p> |

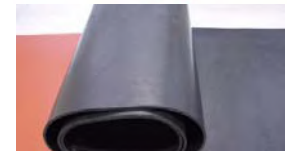


OTHERS

46.3 SOFTENING OF PR FOR DISBONDING

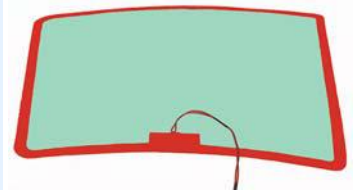
46.3.1 APPLICATION TO THE HALF WING OF ATR72

| Item | P/N | Dimensions |
|-------|-------------|--|
| 46311 | GMIKD010-V* | <p>Complete kit containing :</p> <ul style="list-style-type: none"> - Specific blanket and its neoprene protection - Power driver and temperature limiter <p>*V = 1 version 120V and V= 2 version 230V</p> |



46.3.2 DISBONDING OF WIND SCREEN

| Item | P/N | Dimensions |
|--------------|-----|--|
| GMIKWS01-E-2 | | <p>Complete kit containing :</p> <ul style="list-style-type: none"> - Specific heating blanket having the profile of the screen contour - Pre-set controller |



47 REPAIR OF INFLATING SYSTEMS - SAMANTHA

| Item | P/N | Description |
|-------|-------------|--|
| 47001 | GMIST0704-V | <p>SAMANTHA (Safety Slide repair)</p> <p>V= 2 for 230 Volts V= 1 for 120 Volts</p> <p>Device developed to handle the bonding process of repair patches on flexible structures of inflating systems (safety slides). The console offers following features:</p> <ul style="list-style-type: none"> - Cycle programming, - Temperature control, - Power control - PC interface. <p>The console can control up to 4 patches simultaneously</p> |



Heating systems appropriately designed for this application are available according to dimensions; consult the specific brochure.



OTHERS

48 TEST OF DE-ICER BOOTS FOR REGIONAL COMMUTERS

48.1 PNEUMATIC DE-ICER BOOT TESTER - SACHA

| Item | P/N | Description |
|------|-----|-------------|
|------|-----|-------------|

48101 GMISA9501 **SACHA (Application to ATR Aircraft)**

This console handles all the pneumatic operation sequences specified for this operation. It as been conceived as a self consistent console which integrates high quality pressure control instruments with a design that allows easy operations with the accuracy it was not possible to achieve previously with traditional assembly of pipes, hoses and manometers.

Because of its small size and compact design, the console allows operations in the workshop and is fully transportable to be ready for an outside work.

- Simultaneous test of 2 circuits
- Digital pressure sensing
- Highly accurate control

Units to chose from :

- 1) PSI & Fareneit
- 2) Bar & Celsius

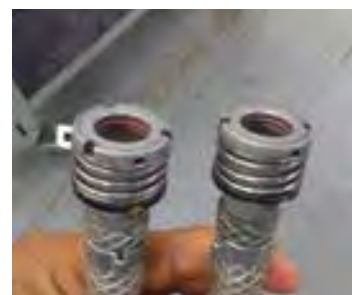


48102 GMISAP060 **Pressure digital gauge**



48103 GMISAP120 **De-icer inflating Hose**

Comes with connectors compatible with, on one side Sacha, and the de-icer on the other side.



(8) EQUIPMENT FOR WORKSHOP CLEAN AND SANDING ROOMS

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49 BASIC SERVICES: VACUUM AND COMPRESSED AIR

49.1 MOBILE VACUUM CENTERS FOR WORKSHOP

| Item | P/N | Description |
|-------|-----------|---|
| 49101 | | Vacuum Pump with oil and tank Mounted on rolls. Ready for simultaneous connection of 5 vacuum bags Proposed in 2 tank capacities: 16 & 25 M3/H; Version : 230 Volts monophase or 380 Volts three phases |
| 49102 | GMIWVR011 | Capacity 16M3/h - monophase 230 Volts |
| 49103 | GMIWVR012 | Capacity 16 M3/h - three phase 380 Volts |
| 49104 | GMIWVR013 | Capacity 25 M3/h - monophase 230 Volts |
| 49105 | GMIWVR014 | Capacity 25 M3/h - three phase 380 Volts |



49.2 MOBILE COMPRESSOR

| Item | P/N | Description |
|-------|-----------|--|
| 49201 | GMIWCM010 | Mobile compressor Useful to drive one machine as sander or router of the mobile workshop at a time. Delivered with its connector and hose of 10 meters to connect to the machine. |




50 DUST SANDING PROTECTION EQUIPMENT


50.1 SANDING BOOTH

This booth allows to proceed to the sanding of carbon and glass parts in a safe self contained working environment. The booth is delivered ready to be installed with built in dust collection, lighting, and sound proof. An electrical cabinet under 3 phases is for the control. We offer several models according to your specific requests.

We propose here below two models according to internal width

| Item | P/N | Description | |
|-------|-----------------|--|---|
| 50101 | GMIWSB180-3-415 | Sanding Booth Model 1 Internal width: 1800 mm External dimensions W x H x D : 1860 x 1960 x 1800 mm |  |
| 50102 | GMIWSB270-3-415 | Sanding Booth Model 2 Internal width: 2700 mm External dimensions W x H x D : 2760 x 1960 x 1800 mm | |

50.2 MOBILE UNIT FOR DUST ASPIRATION

| Item | P/N | Description | |
|--|---------------|----------------------|---|
| Mobile Unit for Dust Aspiration This cleaner unit is designed to protect the operator from fumes and dust ensuring an easy movement for the operator into the work space, without having to install fixed extraction plants. The mechanical filters are easy to be replaced. Conform to EN1822[H12] 99 % 230 Volts monophased | | |  |
| 5021 | GMIWDM015-2 | Complete mobile unit | |
| 5022 | GMIWDM015-F12 | Set of spare filters | |

WORKSHOP

50.3 DOWN DRAFT TABLES



We offer **two** models according to working table length

Model 1: Length 1500 mm

Model 2: Length 2000 mm

General features:

- Working table width 1000 mm
- Working table height: 900 mm
- Working table made in steel grid of node 30 x 30 mm (protection in option)
- Fan: Flow: 5000 m³/h; Motor: 3 Kw; Volts: 230 & 380 Volts
- Filters: 1st level in efficiency F7; 2nd level: Efficiency H14
- Collect bin: 1; dim: 1380 or 1880 x 140 x 70 mm
- Filter check: detection of filter fill up before change; lights to indicate which of the two is to be changed.
- Rejection of air: adaptation hole: 45 cm diam.
- Electrical control cabinet for power on/off.

| Item | P/N | Description |
|----------------|--------------------|---|
| 50301 | GMIWDT015-2 | Model 1 - Dimensions overall: - Working Table dimensions: 1500 x 1000 mm |
| 50302 | GMIWDT020-2 | Model 2 - Dimensions overall: - Working Table dimensions: 2000 x 1000 mm |
| OPTIONS | | |
| 50303 | GMIWDT015-3J | Panels for 3 sides (for model 1) |
| 50304 | GMIWDT020-3J | Panels for 3 sides (for model 2) |
| 50305 | GMIWDT015-L | Lights for Model 1 |
| 50306 | GMIWDT020-L | Lights for Model 2 |
| 50307 | GMIWDTF-F7 | Filter spare - front type F7 |
| 50308 | GMIWDTF-H14 | Filter spare - rear one |
| 50309 | GMIWDTA-NC-100-150 | Neopren Grid 1000 x 1500 mm |
| 503010 | GMIWDT015-CP | Polyester Grid for model 1 |
| 503011 | GMIWDT020-CP | Polyester Grid for model 2 |

51 FREEZERS

51.1 CHEST FREEZERS

| Item | P/N | Description |
|-------|-----------|---|
| 51101 | GMIWPF010 | <p>Chest Freezer for prepreg storage</p> <ul style="list-style-type: none"> • Temperature : -18 to -25°C • Internal Volume : around 590 Liters • Internal length : 150 cm enough for long pre-preg tubes • Only for 230V environments <p>To be delivered optionally with a graphic recorder - see below Consult us for updated specifications.</p> |



51.2 WALK IN FREEZER

| Item | P/N | Description |
|-------|-----------|--|
| 51201 | GMIWCC010 | <p>Cold room for pre-preg storage</p> <ul style="list-style-type: none"> • Volume and storage means allow easy partition of 120 and 180 °C products. • Basic model : 6,15 M3 • Only for 230V environments <p>Other models available. Specs may change.</p> |



51.3 GRAPHIC RECORDER

| Item | P/N | Description |
|-------|-------------|---|
| 51301 | GMIWFR010 | <p>Graphic recorder</p> <p>Delivered with its probe for Freezer or Cold Room</p> |
| 51302 | GMIWFR010-1 | Spares 60 pages of recording ; on 31 days |
| 51303 | GMIWFR010-2 | Pens - Set of spares of 6 pens |



WORKSHOP


51.4 FREEZER ATEX

| Item | P/N | Description |
|-------|----------------|---|
| 51401 | GMIWPFX010-360 | <p>FREEZER ATEX in agreement with ATEX certification CE.</p> <ul style="list-style-type: none">• To store inflammable products and resins• Model 333 liters• Internal Dims: 440 x 470 x 1452 mm External Dim: 600 x 610 x 1640• Only for 230V environments• Temperature display external digital• Automatic defrost with water container. Safety thermostat for anti freeze. <p>Other models available Specs may change Picture not contractual</p> |





52 GENERAL SHOP EQUIPMENT

52.1 WEIGHING SYSTEMS

| Item | P/N | Description | |
|-------|----------------|--|---|
| 52101 | GMIWEB010-600 | High precision weight device to weigh resins and mixing. To be put on a table. Weighting range max: 600g max; precision 0,1g If you need a wider weighting range, see model below |  |
| 52102 | GMIWEB010-2000 | High precision weight device but with range of 2 Kg | |

52.2 ROLL STOCKER

| Item | P/N | Description | |
|-------|---------------|--|---|
| 52201 | GMIWSR102-180 | Roll stocker for 10 rolls Support for <u>10 rolls</u> mounted on both sides. Width of rolls 180 mm Mounted on wheels |  |
| 52202 | GMIWSR071-180 | Roll stocker for 7 rolls Support for <u>7 rolls</u> mounted on both sides. Width of rolls 180 mm Mounted on wheels |  |

52.3 VAPOR ASPIRATION HOOD

| Item | P/N | Description |
|---|-------------|--|
| <p>Vapor Aspiration Hood</p> <ul style="list-style-type: none"> · 15/10th steel construction. · White epoxy painting RAL 9010 with high resistance against chemicals. · Polycarbonate glazed walls · With extractor fan · 230 Volts Nominal | | |
| 52301 | GMIWAH011-2 | Dimensions overall mm : 900 x 750 x 950 |
| 52302: | GMIWAHT010 | Support table for both models Dimensions mm: 1200 x 750 x 750 |



52.4 MIXING POTS

| Item | P/N | Description |
|-------|--------------|--|
| 52401 | GMIAC160-400 | <p>Mixing pot</p> <p>For non wax product Graduated Diameter 80 mm Volume : 400 ml</p> |



52.5 CUTTING LAMINATE - TABLE TOP

| Item | P/N | Description |
|-------|------------------|--|
| 52501 | GMIWDO-6-100-200 | <p>Cutting laminate (green on table in picture) Colour blue Thickness 6 mm Dimensions: 100 x 200 cm</p> <p>Dimensions may change - consult us</p> |



53 EQUIPMENT FOR REPAIR - FABRICATION

53.1 OVENS

Ovens Fully equipped for Repair

Standard model of internal dimensions 2,5 x 2,5 x 4 m;

Fully equipped.

With vacuum system

With **GMI ANIFIB Computer control**



53.2 AUTOCLAVES

According to dimensions and specifications
Fully controlled by our computers ANIFIB

Simplified Model also available for easy doubler
fabrication (ANICLAVE©)

Consult our brochure



54 PARTS FOR CURING IN AUTOCLAVE

54.1 VACUUM HOSE

| Item | P/N | Description |
|---|----------------|---------------|
| Vacuum hose high temperature Threaded 1/4" NPT | | |
| 54101 | GMIAUVH010-010 | Length 1,0 m |
| 54102 | GMIAUVH010-015 | Length 1,5 m |
| 54103 | GMIAUVH010-020 | Length 2,0 m |
| 54104 | GMIAUVH010-025 | Length 2,5 m |
| 54105 | GMIAUVH010-030 | Length 3,0 m |
| 54106 | GMIAUVH010-040 | Length 4,0 m |
| 54107 | GMIAUVH010-050 | Length 5,0 m |
| 54108 | GMIAUVH010-060 | Length 6,0 m |
| 54109 | GMIAUVH010-070 | Length 7,0 m |
| 541010 | GMIAUVH010-080 | Length 8,0 m |
| 541011 | GMIAUVH010-090 | Length 9,0 m |
| 541012 | GMIAUVH010-100 | Length 10,0 m |
| 541013 | GMIAUVH010-110 | Length 11,0 m |
| 541014 | GMIAUVH010-120 | Length 12,0 m |




54.2 VACUUM VALVES

| Item | P/N | Description |
|--|------------|--|
| Valves High Quality for autoclaves - Stainless Steel - Viton seal | | |
| 54201 | GMIAUVB010 | <p>Vacuum Valve</p> <ul style="list-style-type: none"> • Base size: 2 inches • Connection size: 1/4 inch |
| 54202 | GMIAUVP010 | <p>Vacuum Plug</p> <ul style="list-style-type: none"> • QRC plug with female thread • Thread size: 1/4 inch |
| 54203 | GMIAUVS010 | <p>Vacuum Socket</p> <ul style="list-style-type: none"> • QRC Socket Connector with female thread • Thread size: 1/4 inch |







55 CALIBRATION SETS FOR OUR INSTRUMENTS

55.1 CALIBRATOR OF TEMPERATURE FOR ANITA CONSOLES



| Item | P/N | Description | |
|-------|------------|---|---|
| 55101 | GMIINGT250 | Portable temperature calibrator for temperature circuits of Anita by simulation of thermocouples J or K. This instrument is also a thermometer for thermocouples J or K. |  |

55.2 CALIBRATOR SET FOR VACUUM CALIBRATION


| Item | P/N | Description | |
|-------|--------------|--|---|
| 55201 | GMIOTV251-01 | Hand vacuum pump to achieve a vacuum level in the sensor circuit of the Anita console; to be associated with the vacuum measuring instrument below. |  |
| 55202 | GMIOTV251-02 | Reference vacuum manometer high precision to compare to the value of the Anita. Comes fully equipped for connection to pump above. |  |
| 55203 | GMIOTV251 | Kit containing the two elements above: hand pump and vacuum reference |  |
| 55204 | GMIOTV252 | Complete kit as above : - with manual pump and a digital precision manometer |  |

WORKSHOP

55.3 CALIBRATION UNIT FOR THERMOCOUPLE CABLES

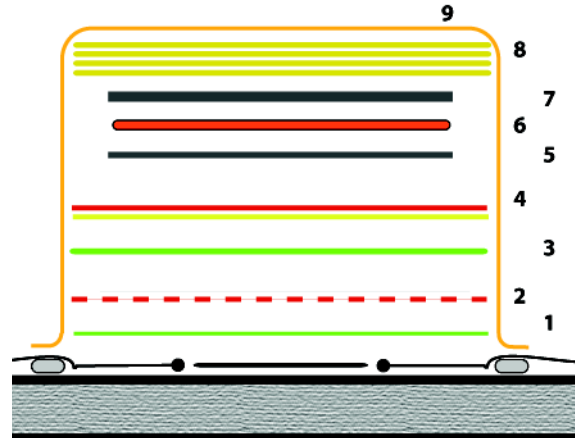
| Item | P/N | Description | |
|---|---------------|---|---|
| <p>In order to qualify thermocouples with a precision of +/- 1.0°C. This is composed of a set of 3 separate units necessary</p> | | | |
| 55301 | GMIFC1000 | <p>Dry oven as a calibrated heat source with a precision of +/- 1.5°C. Portable instrument. All coming with a methodological manual</p> |  |
| 55302 | GMINGT550 | <p>A thermometer of reference of high precision +/- 0,5°C</p> <p>Note : Picture not contractual</p> |  |
| 55303 | GMINGT550-010 | <p>A reference probe to measure the error of the heat source</p> | |

55.4 CHECKING UNIT FOR HEATING BLANKETS

| Item | P/N | Description | |
|-------|--------------|---|---|
| 55401 | GMITHB010 | <p>A precise instrument to register with fidelity the ohmic value of the blanket resistance with appropriate cables to connect to Anita Blankets</p> <p>Note : Picture not contractual</p> |  |
| 55402 | GMITHBE020-1 | <p>Cable for connecting / testing a Blanket 230V - 20A with a European Plug</p> | |
| 55403 | GMITHBE030-1 | <p>Cable for connecting / testing a Blanket 230V - 30A with a US Plug</p> | |

(9)REPAIR MATERIALS**56 REPAIR PRODUCTS****56.1 VACUUM BAG MATERIALS**

According to identification numbers in the following sketch of a typical vacuum bag montage:



| Item | P/N | Description |
|--------|------------|---|
| 56101 | GMIPEV1010 | # 1 -Release fabric |
| 56102 | GMIPEV1019 | #2 - Perforated nylon |
| 56103 | GMIPEV1022 | #3 - Bleeder fabric |
| 56104 | GMIPEV1011 | #4 - Non perforated nylon |
| 56105 | GMIPEV1014 | # 5 - Flexible caul plate Sheet 1,4 m width |
| 56106 | GMIPEV1024 | # 7 - Insulator Sheet flexible 1,4 m width |
| 56107 | GMIPEV1013 | # 8 - Airweave - Breather |
| 56108 | GMIPEV1018 | # 9 - Vacuum bag nylon |
| 56109 | GMIPEV1015 | Vacuum bag tape (GS213) |
| 561010 | GMIPEV1016 | High temperature tape |



Specific products can be delivered under specific request like adhesives, Prepreg, honeycomb.

56.2 BAGGING KIT FOR ON SITE MISSION

For customers who have ready at hand a complete bagging kit for Mission On the Go, GMI offers a prepared kit with a selection of the necessary products, in a sealed pack:



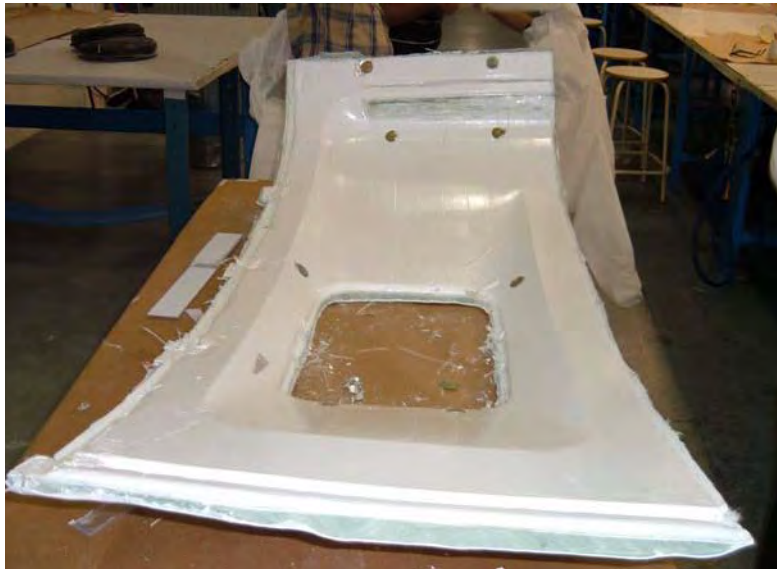
56.3 DRY FABRICS

GMI Aero can deliver products in Kits according to minimum quantities of:

- a) Glass fiber
- b) Carbon fiber
- c) Metallisation fabrics

56.4 OTHER PRODUCTS

- a) Adhesive films
- b) Foaming adhesives
- c) Honeycomb panels
- d) Moulding products



(10) TRAINING SERVICES

We propose various level of training. Consult our extensive catalogue.

Courses aim at transferring to the users a practical knowledge of the theory and of the principles of advanced composite repair and hands on practice of the specific equipment. A program is established in each case.

We offer courses that may be classified into 3 groups:

1 Transfer of Technology in the field of Repair Processes

These courses cover all the fundamental basic and advances themes of aircraft composite part repairs. Moreover some programs are proposed here that deal with basic physics of processes like “drying”, heat transfer,...

2 One Day Clinic:

Mastering the operating procedures of our maintenance equipment.

These courses have for objective to review the operating procedures of our equipment and the instructions for calibration and servicing. Voluntarily these courses are concentrated in one or two days maximum

3 Specific part repair or On Job Training

These courses are conducted to demonstrate the actual procedures for repairing specific parts. The operators are guided to follow exactly the SRM, CMM procedures and to perform the repair operations.



57 LEVEL I – BASIC BONDED COMPOSITE REPAIR (5 DAYS)

Scope: This curriculum is intended to meet the formal training requirement for individuals who intend to become certified as aircraft composite repair technicians. Persons who successfully complete this aircraft structural repair training program are considered to be able to perform **basic** composite bonded repairs to aircraft structures in compliance with the manufacturers’ repair documentation or other acceptable or approved repair data.

Applicable documents: GMI Aero proposed Training Courses align with the latest SAE Commercial Aircraft Composite Repair Committee (**CACRC**) and regulatory authorities documents, as follows:

- **AIR4938C** Composite and Bonded Structure Technician/Specialist Training Document
- **AIR4844D** Composites and Metal Bonding Glossary
- **AIR5719B** Teaching Points for an Awareness Class on "Critical Issues in Composite Maintenance and Repair"
- **FAA AC 65-33** Development of Training/Qualification Programs for Composite Maintenance Technicians

Trainee’s prerequisites:

- Experience as aircraft maintenance technician or engineer
- Good knowledge of the English language (minimum B2)
- Basic mathematics, physics and chemistry considerations (minimum High School level or equivalent)

Course Outline: This training course is divided into four (4) main training units, namely:

- Basic Theoretical Considerations
- Bonded Composite Repair Equipment and Toolings for Curing and Machining
- Implementation of actual Bonded Composite Repairs
- Theoretical & Practical Examinations

| Day 1 - Theory | Day 2 Curing/Machining | Day 3 - Repair Application | Day 4 - Repair Application | Day 5 - Examinations |
|---|--|--|--|---|
| <ul style="list-style-type: none"> • Introduction to aircraft composite structures • Matrix System • Safety & Environment • Adhesive Aircraft Design Considerations • Heat Transfer • Bonding Repair consideration • Damage Assessment | <ul style="list-style-type: none"> • Hands On Exercises • Introduction to Basic Composite Repair Equipment | <ul style="list-style-type: none"> • Repair of monolithic part using wet lay-up | <ul style="list-style-type: none"> • Repair of sandwich part using prepeg | <ul style="list-style-type: none"> • Practical Assessment • Written Examination |

58 LEVEL II – ADVANCED BONDED COMPOSITE REPAIR (10 DAYS)

Scope: This curriculum is intended to meet the formal training requirement for individuals who intend to become certified as aircraft composite repair technicians. Persons who successfully complete this aircraft structural repair training program are considered to be able to perform **advanced** composite bonded repairs to aircraft structures in compliance with the manufacturers’ repair documentation or other acceptable or approved repair data.

Applicable documents: GMI Aero proposed Training Courses align with the latest SAE Commercial Aircraft Composite Repair Committee (**CACRC**) and regulatory authorities documents, as follows:

- **AIR4938C** Composite and Bonded Structure Technician/Specialist Training Document
- **AIR4844D** Composites and Metal Bonding Glossary
- **AIR5719B** Teaching Points for an Awareness Class on "Critical Issues in Composite Maintenance and Repair"
- **FAA AC 65-33** Development of Training/Qualification Programs for Composite Maintenance Technicians

Trainee’s prerequisites:

- Experience as aircraft maintenance technician or engineer
- Good knowledge of the English language (minimum B2)
- Basic mathematics, physics and chemistry considerations (minimum High School level or equivalent)

Course Outline: This training course is divided into four (4) main training units, namely:

- Basic Theoretical Considerations
- Bonded Composite Repair Equipment and Toolings for Curing and Machining
- Implementation of actual Bonded Composite Repairs
- Theoretical & Practical Examinations

| Day 1 - Theory | Day 2 Theory | Day 3 - Theory | Day 4 - Repair Application | Day 5 - Repair Application |
|--|--|---|--|---|
| <ul style="list-style-type: none"> • Introduction to aircraft composite structures • Matrix System | <ul style="list-style-type: none"> • Safety & Environment • Adhesive Aircraft Design Considerations • Heat Transfer | <ul style="list-style-type: none"> • Bonding Repair consideration • Damage Assessment | <ul style="list-style-type: none"> • Hands On Exercises • Introduction to Basic Composite Repair Equipment | <ul style="list-style-type: none"> • Hands On Exercises • Introduction to Basic Composite Repair Equipment |
| Day 6 - Repairs Implementation | Day 7- Repairs Implementation | Day 8- Repairs Implementation | Day 9 - Assessment & Exam | Day 10- Assessment & Exam |
| <ul style="list-style-type: none"> • Repair of sandwich part using wet lay up | <ul style="list-style-type: none"> • Repair of sandwich part using prepreg | <ul style="list-style-type: none"> • Repair of sandwich parts core with ply drop offs | <ul style="list-style-type: none"> • Practical Assessment (damage assessment, vacuum bagging...) | <ul style="list-style-type: none"> • Practical Assessment (Inspection, NDT, Ultrasonic) • Written Examination |

59 LEVEL II – ADVANCED BONDED COMPOSITE REPAIR INTENSIVE (5 DAYS)

Scope: This curriculum is intended to meet the formal training requirement for individuals who intend to become certified as aircraft composite repair technicians. Persons who successfully complete this aircraft structural repair intensive training program are considered to be able to perform **advanced** composite bonded repairs to aircraft structures in compliance with the manufacturers' repair documentation or other acceptable or approved repair data.

Applicable documents: GMI Aero proposed Training Courses align with the latest SAE Commercial Aircraft Composite Repair Committee (**CACRC**) and regulatory authorities documents, as follows:

- **AIR4938C** Composite and Bonded Structure Technician/Specialist Training Document
- **AIR4844D** Composites and Metal Bonding Glossary
- **AIR5719B** Teaching Points for an Awareness Class on "Critical Issues in Composite Maintenance and Repair"
- **FAA AC 65-33** Development of Training/Qualification Programs for Composite Maintenance Technicians

Trainee's prerequisites:

- Basic experience as technician or engineer in bonded composite repairs (Level I)
- Already performed repairs with wet layup and started prepeg repairs
-
- Good knowledge of the English language (minimum B2)
- Basic mathematics, physics and chemistry considerations (minimum High School - level or equivalent)

Course Outline: This training course is divided into four (4) main training units, namely:

- Basic Theoretical Considerations
- Bonded Composite Repair Equipment and Toolings for Curing and Machining
- Implementation of actual Bonded Composite Repairs
- Theoretical & Practical Examinations

Course Content: See Table below. Contents will include only "Advanced" subjects in each topic.

| Day 1 - Theory | Day 2 Curing/Machining | Day 3 - Repair Application | Day 4 - Repair Application | Day 5 - Examinations |
|---|--|--|--|---|
| <ul style="list-style-type: none"> • Introduction to aircraft composite structures • Matrix System • Safety & Environment • Adhesive Aircraft Design Considerations • Heat Transfer • Bonding Repair consideration • Damage Assessment | <ul style="list-style-type: none"> • Hands On Exercises • Introduction to Basic Composite Repair Equipment | <ul style="list-style-type: none"> • Repair of complex monolithic part using wet lay up | <ul style="list-style-type: none"> • Repair of complex sandwich part using prepeg | <ul style="list-style-type: none"> • Practical Assessment • Written Examination |

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