Riber refurbishment solutions can significantly extend the useful life of your equipment and provide a cost effective alternative to purchasing new equipment.

The refurbishment services can allow you to save 40 to 60% on the cost of new equipment. Chemical cleaning and refreshing operations make it possible to ensure the optimum use of your products.

Riber has been successfully refurbishing equipment for over 30 years. Thanks to its extensive skills and experience, the Riber service team ensures that each refurbished equipment item, system or part will satisfy the original specification.
A quality refurbishment requires experience and respect of the procedures. Riber follows several steps in the framework of a high quality process charter.

1. Evaluation and contract
   Full evaluation of the equipment condition. Price quotation and statement of work.

2. Disassembly
   Once the equipment is shipped to our factory, we perform a complete disassembly of the parts.*
   All parts are carefully inspected for damages or defects. Removing, crating and shipping of the contaminated parts can be supported by Riber.
   (*) Chamber to be delivered dismantled with blank ports

3. Cleaning and repair
   All the parts are decontaminated and chemically cleaned. We replace damaged parts that fail to meet specifications. Such parts include: ball bearing, thermocouple and/or power feedthrough, bellows, screen etc.

4. Reassembling
   New parts are installed and equipment is assembled.

5. Test
   Equipment is degassed * and/or baked and leak tested under vacuum to assure functional performances.
   (*) depending of the equipment

6. Shipping and delivery
   Riber delivers and optionally installs equipment at customer’s site.

List of equipment that can be refurbished for all Riber and VG systems:

- LN2 shrouds (main, pumping well)
- Manipulator
- Cells
- Shutters and shutter flanges
- Etc. (contact Riber for special requests)
From our expertise, we have ready-to-use package prices for each type of refurbishment. This package can be customized according to your needs.

We propose three levels of support called: Bronze, Silver, Gold and Platinum.

<table>
<thead>
<tr>
<th>SERVICE PACK</th>
<th>TECHNICAL SPECIFICATIONS</th>
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<tr>
<td><strong>BRONZE</strong></td>
<td>Cleaning of the MBE32 and basic maintenance</td>
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<td>■ Cleaning of the growth chamber</td>
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<td>■ Replacement of the transfer shutter</td>
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<td>■ New ion gauge</td>
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<td>■ Maintenance of the RHEED screen shutter</td>
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<td>■ Installation of the shroud in the growth chamber</td>
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<td></td>
<td>Delivery time: 4 months after purchase order and receipt of the R32 chamber.</td>
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<td><strong>SILVER</strong></td>
<td>Cleaning of the MBE32 and advanced maintenance</td>
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<td></td>
<td>■ Cleaning of the growth chamber</td>
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<td></td>
<td>■ Cleaning of the 3 cryo-shrouds</td>
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<td>■ Replacement of 8 cell shutters mechanisms: rotary feedthrough, shaft and shutter blade (handle is reused)</td>
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<td></td>
<td>■ Replacement of the main shutter mechanism: rotary feedthrough, shaft and shutter blade (handle is reused)</td>
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<td></td>
<td>■ Maintenance of the RHEED screen shutter</td>
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<td>■ New ion gauge</td>
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<td>■ Replacement of the titanium filament</td>
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<td>Delivery time: 4 months after purchase order and receipt of the R32 chamber.</td>
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GOLD

Cleaning of the MBE32 chamber, new cryo-shrouds and advanced maintenance

- Cleaning of the growth chamber
- Replacement of the TSP (Titanium Sublimator Pump) well and cryo-shroud
- Replacement of the main cryo-shroud
- Replacement of the sources flange and sources cryo-shroud: either the standard 8xS40 cells port or special 2xS63+5xS40
- Replacement of 8 cell shutters mechanisms: rotary feedthrough, shaft and shutter blade
- Replacement of the main shutter mechanism: rotary feedthrough and handle, shaft and shutter blade
- Replacement of the RHEED screen
- Maintenance of the RHEED screen shutter
- Replacement of the transfer shutter
- New ion gauge
- Replacement of the titanium filament

Delivery time: 6 months after purchase order. The R32 chamber should be on the RIBER site at least 3 months before delivery.

PLATINUM

Upgrade to C21TM Chamber

- New bottom-up C21 MBE reactor with 10 effusion sources ports (7 x CF63 ; 3 x CF40) compatible with Modutrac
  The C21TM reactor offers several ports: 2 x CF40 flange for an Ellipsometer, 1x CF40 flange for a pyrometer, 2 x CF40 flange for reflectance, an extra CF100 bottom flange for instrumentation or an extra source and others.
- Main cryo-shroud compatible with the TAL14 LN2 fitting of your R32 liquid nitrogen delivery system
- Chamber frame
- Bayard Alpert gauge head
- Heating mantle for bake-out of the whole chamber compatible with the R32 baking power supply 602S
- 8 shutters with motors and remote shutter electronics –ACM– (2 extra ports are blanked and can be upgraded later on)
- LN2 cryo-shroud (titanium sublimation well) with the TAL14 LN2
- Main shutter CF200 flange with motorization
- Upgrade of the existing ARM 2” or ARM 3” substrate manipulator
- Electronic control (ACM V2) for controlling the shutters and the substrate manipulator rotation. Functions for the control of the customer gate valve and extra motorization are available with the package

Delivery time: 6 months after purchase order. ARM should be sent at least 4 months before delivery.

*Crating and shipping from Customer to Riber not included.
*In case of non visible defects, additional costs may apply (ex: weld defects, flange knives defects, et.)
OPTIONS (FOR ALL PACKS)

- Disassembly / installation at customer site

- Full maintenance of the manipulator ARM on the RIBER site
  or basic maintenance on the customer site

- New MBE32 cryo-shrouds and cell flange assembly
  which do not require the shipment of your R32 chamber to RIBER* (see picture below)

- ACM
  Automated Control Machine designed to control MBE equipment such as manipulators, shutters, titanium sublimation pumps, etc.
  New Crystal XE software («Supervisory Control and Data Acquisition»)

- New pneumatic shutter actuator

- New electrical cabinet

- MBE sources

*New R32 cryo-shrouds and cell flange as shown above can be manufactured and installed on your old R32 system. A different cell flange design with a new port configuration is also available.
Riber is the world leading supplier of MBE processing equipment and related services.

In total, 850 of our MBE systems have been installed with at least one system in each of the 35 countries with which MBE is involved. This represents 75% of the global market.

Capitalizing on more than 30 years of experience, the company’s core philosophy is to design systems in close association with customers. Riber has invented and designed major features which are now found in all MBE systems.

Riber plays a key role in the development of MBE technology, providing customers with solutions from equipment to epitaxial growth.

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