

MCL - Mercury « constant level » Cell

- Field proven technology for over 30 years
- Large mercury capacity
- Refill without breaking growth chamber vacuum
- Constant flux for hours
- Run to run compositional reproducibility
- Easy to use, allows bakeout operation



Product introduction

Riber Mercury cell, model MCL allows the growth of thick MCT layers with precise control in composition for Infra-Red devices. MCL source provides a constant mercury level in a conventional cell configuration, connected to a large reservoir. Gravity keeps constant the level of mercury between the cell and the reservoir. A sensor located in the effusion cell allows to adjust the level of Mercury by mean of the reservoir motion. The large difference between the surface area of the Mercury in the cell and in the reservoir, does not require to move the reservoir during the growth.

Growing 10 μ m of MCT epilayers at 200°C only requires 1mm of mercury level in the cell. With the level sensor, Mercury level is easily returned to its original pre-calibrated level for the start of each new growth.

Precise control of the cell temperature combined to the Mercury level setting enables an excellent flux stability and reproducibility. The cell is also designed to

have a rapid thermal response to temperature changes, for rapid flux variations. This feature is especially useful for applications which specifically require graded doping and composition

Working principle

The RIBER constant level Mercury effusion cell consist of two parts:

- The evaporator, located inside the growth chamber.
- A mercury reservoir, external to the growth chamber, mounted on a vertical translation device.

A Mercury circulation system connects the two parts.

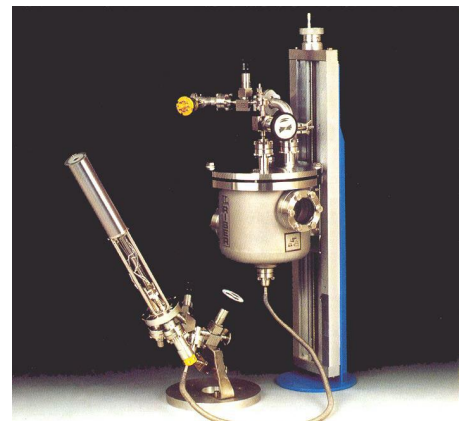
It is based on the communicating vessel principle: displace the reservoir on the vertical translation device causes a change of mercury level in the cell.

This system permits to adjust the mercury level in the cell for evaporation, by a vertical external reservoir movement.

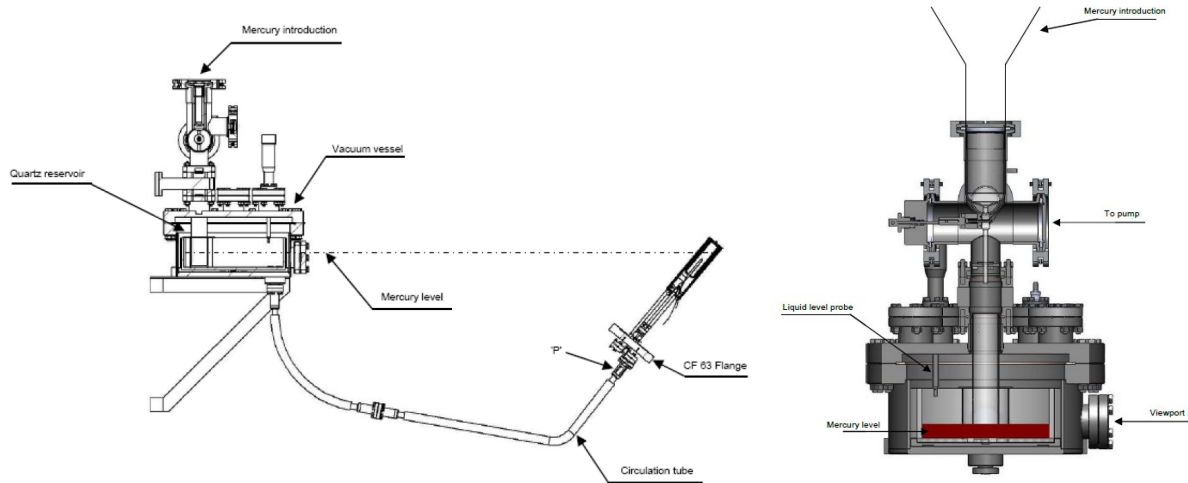
During evaporation, when the reservoir is

in a fixed position, a level change of 1 mm corresponds:

- > to the evaporation of 11.30 cm³ of mercury for MCL 160.
- > to the evaporation of 37.30 cm³ of mercury for MCL 190.



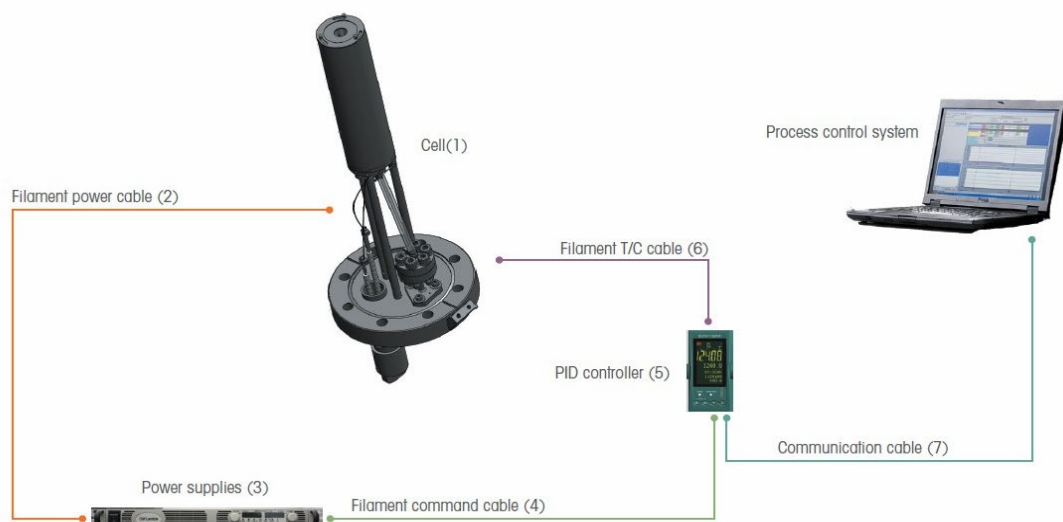
Layout



Specifications

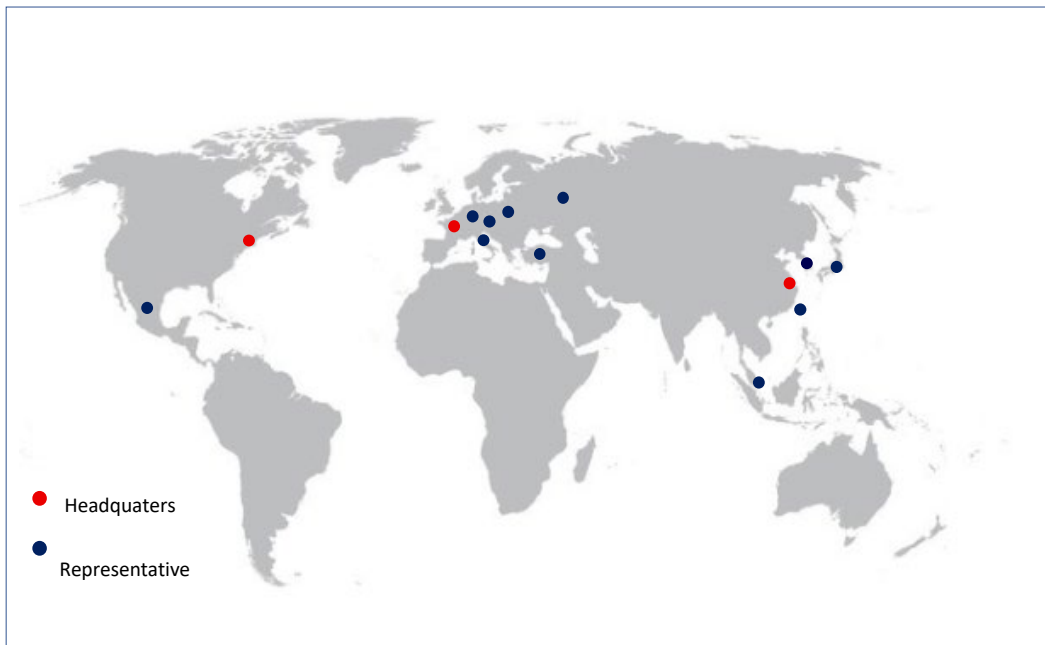
Characteristics	MCL 160	MCL 190
Filament	Flat Ta filament	
Mounting flange	CF40	CF 63
Reservoir capacity	1100 cc	3700 cc
Reservoir material	Quartz	
Pressure operating range	$10^{-12} - 10^{-13}$	
Maximum pressure	10^{-3} Torr	
Crucible material	Quartz	
Typical operating temperature	80-110°C	
Maximum outgassing temperature	700°C	
Temperature stability	0,2°C	
Power supply	One power supply / One PID	
Mercury reservoir level adjustment	Manual lift platform	Motorized lift

Component interfacing



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For more information, please contact your local sales representative



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