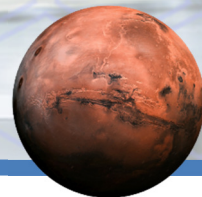




# International Crystal Labs

## Specialty Gas Cells for Infrared Spectroscopy

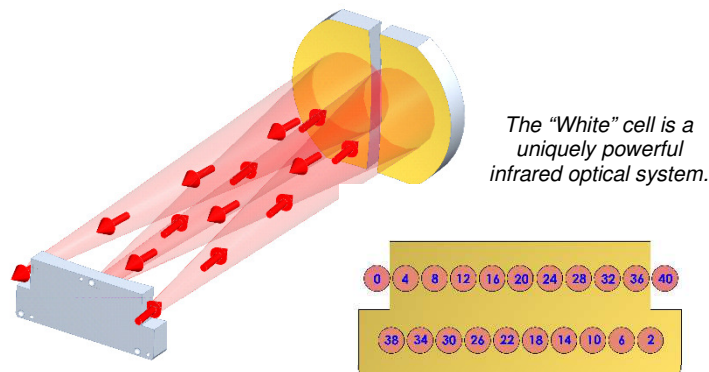
### Mars Series Long Path Gas Cells



*Mars Series Cells are provided in a variety of volumes and pathlengths*

A key design element that ensures the durability and serviceability of each Gemini™ Mars gas cell is their stainless steel mirrors. These high-quality gold coated SS mirrors are extremely durable and can be reconditioned many times at modest cost, thereby extending the service life of each cell for many years. Polished stainless mirrors are a superior optical surface to aluminum diamond-turned mirrors from the standpoint of both durability and long-term serviceability. All mirrors are coated with GemGold™, a multilayer protected gold coating designed to provide the highest level of performance under the most demanding sampling conditions.

International Crystal Laboratories has been a leading worldwide supplier of high-quality spectroscopy accessories and supplies for more than 50 years. Gemini™ Mars gas cells, available from ICL, are designed for semiconductor, specialty gas, emissions and other applications that demand high performance, durable cells, seals and hardware. Mars™ cells comprise a robust series of metal body gas sampling accessories constructed entirely of 316 SS or nickel-plated aluminum.



Gemini™ Mars gas cells feature modular design with interchangeable components that are easily reconditioned to like-new condition. Mars™ cells can be provided with heaters and temperature controllers for high temperature operation. Many different coatings to enhance inertness and passivity can be provided, including Silconert™ and Tiodize™.



*Cells are provided with heaters and temperature controllers*



### International Crystal Laboratories

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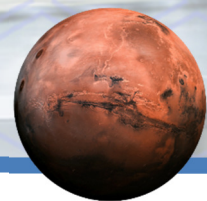
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# International Crystal Labs

## Specialty Gas Cells for Infrared Spectroscopy

### Mars Series Long Path Gas Cells



Gemini™ Mars gas cells are ideally suited for demanding, industrial or process applications, where ruggedness and durability are of critical importance, and precision fixed optical alignment is needed to assure good optical performance. Mars™ series cells are simply and elegantly constructed of six (6) basic building block components to be both rugged and reliable. The robust design never requires optical alignment and ensures ease of use and serviceability.

**A - The valve and fitting endplate.** The endplate is on the very top of the cell, and commonly carries the valves, gauges, fittings, and sample line connections. It can be easily removed from the cell without disturbing the other critical cell components or affecting optical alignment.

**B - The precision mirror mounting tray.** The mounting tray is virtually a single solid piece containing the precision aligned mirrors which define the cell pathlength. The mirror tray rests inside the cell body on a relieved portion of the cell body wall, and is secured in place during operation by small stainless screws. The mirror tray is easily removed from the cell for cleaning or replacement.

**C - The Cell Body.** The outer assembly which holds the entire system together comprises a heavy walled metal cylinder with precision machined ends for high vacuum operation. Tapped holes draw the endplates together to form the seal. End plates are secured in place with six (6) easily removable bolts on each end. Metal cell bodies can be provided from various materials including passivated or electropolished stainless steel, nickel, anodized or nickel coated aluminum, or FEP Teflon® coated aluminum.

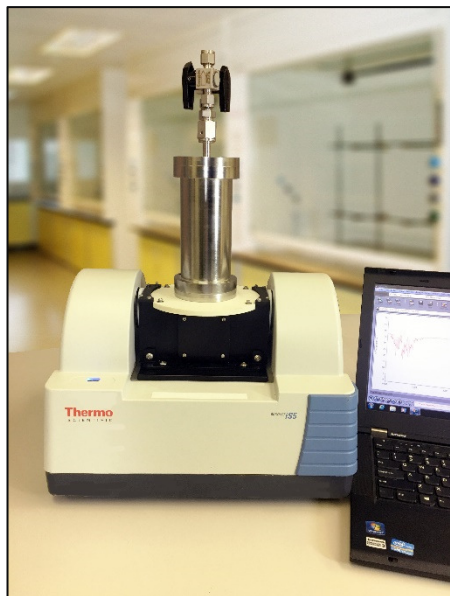
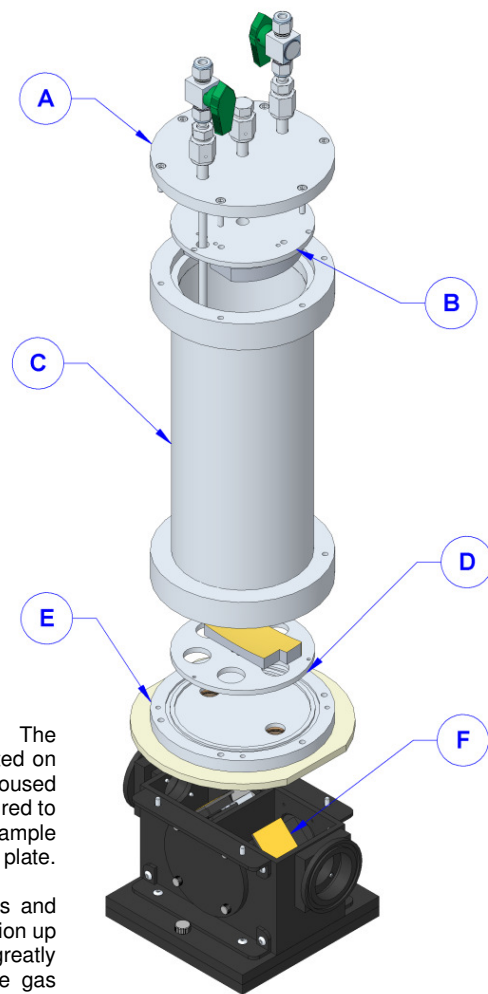
**D - Precision aligned nesting mirror.** The nesting mirror, like the removable mirror mounting tray, is a critical optical component that can be easily removed for service, but is in fixed, permanent alignment. The infrared images line up in two rows on this mirror using traditional White optical design; the number of images arrayed on the mirror defines the overall cell pathlength.

**E - The window endplate.** The window endplate carries IR transmitting crystals of any type. The most common windows are KBr, ZnSe, BaF<sub>2</sub>, CaF<sub>2</sub>, or KRS5. It also is the main piece of hardware that is used to mount the cell transfer optics and mounting fixture, and forms the main vacuum/pressure seal of the system.

**F - The transfer optics and mounting fixture.** The transfer optics comprise two (2) flat mirrors mounted on precision-alignment optical fixtures which are housed inside of a purge capable aluminum box, all configured to mount securely within a PE instrument specific sample compartment and on a PE instrument specific base plate.

Long path gas cells can be provided with heaters and temperature controllers for high temperature operation up to 200 °C. Because extreme temperatures can greatly increase the reactivity and corrosive effect of the gas sample, users are encouraged to moderate the temperature requirement wherever possible.

In extreme cases, where very high temperature is a requirement, the all 316ss gas cells are especially suitable. Nickel plated aluminum gas cells can tolerate the high temperature, but may not stand up as well over time when compared to the 316ss configurations. Authentic KalRez® o-rings can be provided at an additional cost to provide better chemical compatibility with corrosive or reactive mixtures, and also provide long term seal integrity at elevated temperatures. Heaters and controllers can be provided for 110v or 220v operation. Each kit comes with a wiring harness and J-type thermocouple appropriate to the controller voltage and country where the cell will be used.



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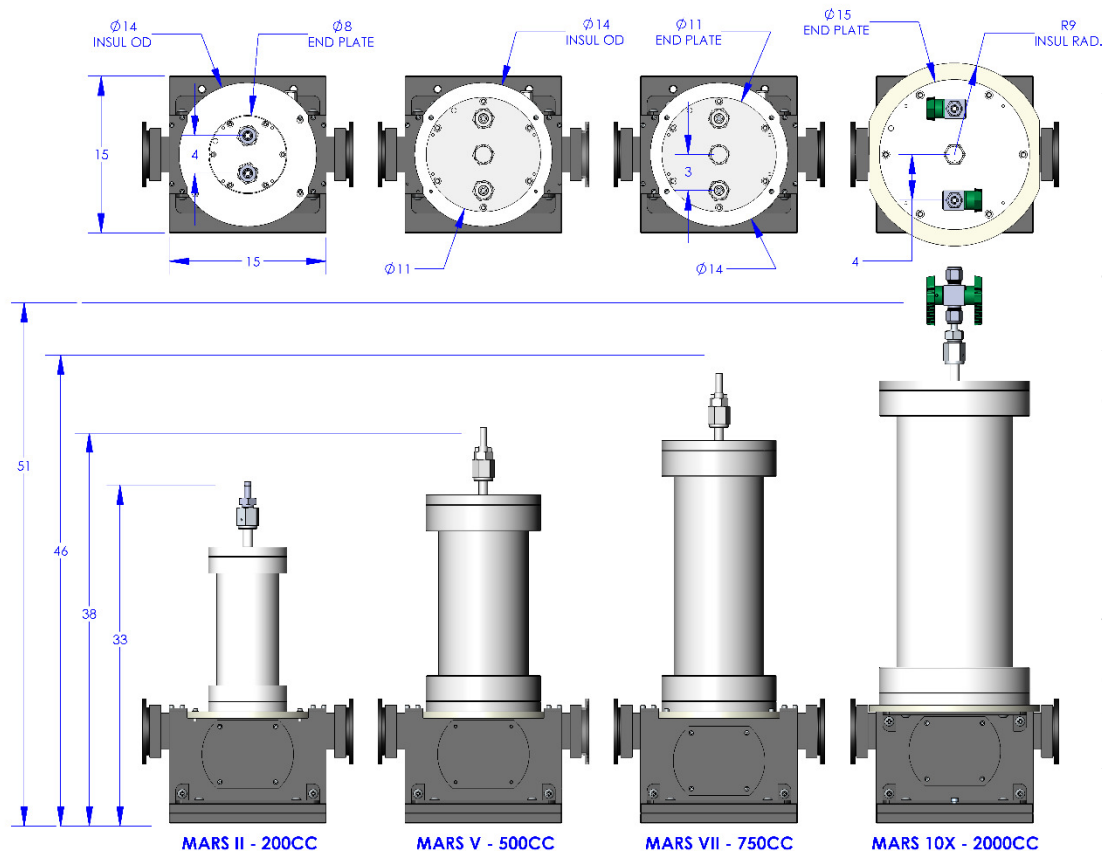
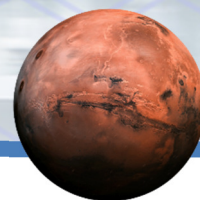
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All-316SS cell configurations are recommended for highly corrosive mixtures or high-temperature operation. Nickel plated aluminum is a lower cost alternative. Several different coatings to enhance inertness and passivity can be provided, including Silconert™ and Tiodize™ coatings (request quote).

All mirrors are coated with GemGold™, a multilayer protected gold coating designed to provide the highest level of performance under the most demanding sampling conditions.

Mars™ cells can be provided with heaters and temperature controllers for high-temperature operation. Vertical mounted cells fit into nearly any bench-top FTIR like Thermo, PE, Bruker, Shimadzu, etc. Heater and Temperature controller optional - specify 110v or 220v.

Authentic KalRez® seals are recommended for heated gas cells. KalRez® is a registered trademark of E.I. DuPont de Nemours and Company.

Part Number	Description	Pathlength	Volume
0008-9283	MARS II-long-path 2m gas cell, all 316SSwith purge capable transfer optics fixture and VCR gas sample fittings	2 meters, fixed	375cc
0008-9285	MARS V-long-path 4.8m gas cell, all 316SSwith purge capable transfer optics fixture and VCR gas sample fittings	4.8 meters, fixed	500cc
0008-7679	MARS VII-long-path 6.4m gas cell, all 316SSwith purge capable transfer optics fixture and VCR gas sample fittings	6.4 meters, fixed	750cc
0008-9290	MARS X-long-path 10m gas cell, all 316SSwith purge capable transfer optics fixture and VCR gas sample fittings	10 meters, fixed	2 liters
0008-7684 0017-5548 or 0017-4804	Heaters For Gas Cells, 110v or 220v Digital Temperature Controller, 110v or 220v		