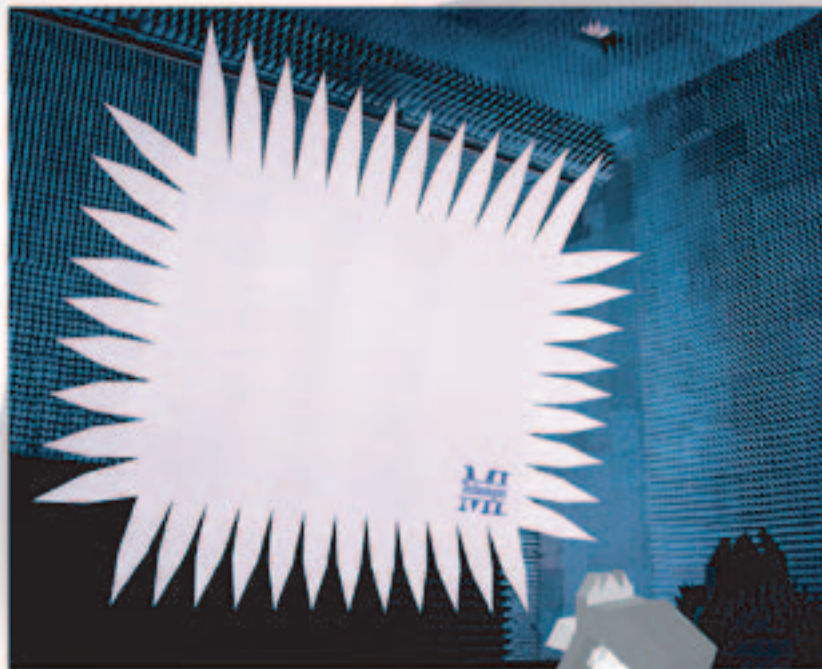


MI-500 Family of Compact Range Reflectors



A Compact Range to Meet Every Requirement

- Lightweight Carbon Composite Backup Structures
- High Conductivity Silver-Coated Machined Surface
- Rolled Edges for Minimum Diffraction
- Serrated Edges for Control of Chamber Illumination
- Choice of Feed Locations: Center-Fed, Corner-Fed, Side-Fed
- Wide (1-200 GHz) Operating Bandwidth



1-800-854-3660
www.mi-technologies.com

MI-500 Family of Compact Range Reflectors

MI Technologies is proud to introduce the MI-500 Family of Compact Range Reflectors, the 4th Generation of superior compact range products from the leader in the industry.

For more than 30 years, MI Technologies has set the standard for Compact Range design, manufacturing, installation and performance. The first commercial Compact Range was developed by us in 1972; and, since that time we have delivered and installed hundreds of these units worldwide. Our designs include serrated and rolled-edge reflectors that operate at frequencies from 1 to 200 GHz with test zones that range in size from 1 to 38 feet (0.3 - 11.6 m) in diameter.

The new, MI-500 Family of Compact Range reflectors continues MI Technologies' heritage and leadership in the design, fabrication, integration and delivery of compact range reflector test systems.

This new generation of reflectors is constructed using highly rigid, thermally stable, yet lightweight and modular, carbon composite backup structures. The precisely machined surface is finished with a silver-coating for high electrical conductivity and reflection efficiency. This new family of compact range reflectors supports flexible design and size considerations to meet a wide range of test chamber configurations. MI-500 Reflectors can be made in rolled edge configurations for minimum diffraction, or serrated edges for control of chamber illumination.

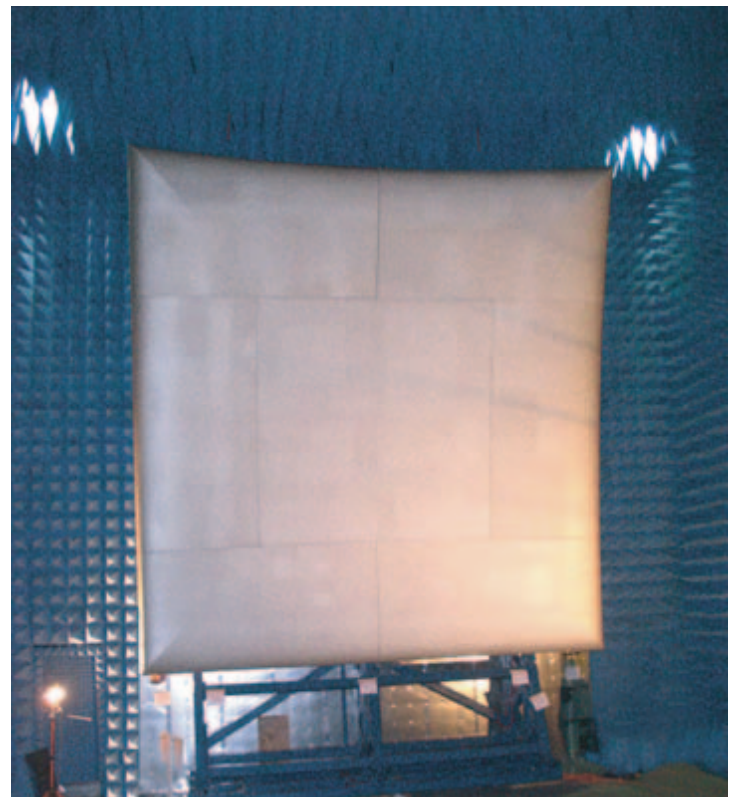
Each MI-500 Compact Range Reflector is made to exacting standards for optimum illumination and uniformity. The reflector's main body is the structural "back bone" of the composite assembly and provides the structural integrity. The serrated or rolled edges are fabricated of lightweight materials that serve to provide structural integrity for themselves, not the overall composite assembly, thus significantly reducing the unit's weight. All reflectors have a life expectancy exceeding 20 years.

The MI-500 Family of Compact Range Reflectors offers three feed layouts - Center Fed, Corner Fed and Side Fed - to allow the most flexibility for your test range design.

Key Features

Fabricated of carbon composite materials which provide:

- High stiffness to weight ratio
- Superior thermal properties
- Short manufacturing schedules
- Focal Lengths from 3 feet to 36 feet (0.9 to 11.0 meters)
- Designed to be configurable as center, corner or side fed systems
- Configurable with serrated or rolled edges
- Modular design is easily configured to unique specifications and requirements including customer reflector geometries and edge treatments
- Wide Frequency Range of 1-200 GHz



Rolled edge reflectors for optimal control of test zone illumination

MI Technologies' standard offerings for Center Fed, Corner Fed and Side Fed Compact Range Reflectors are shown in the accompanying tables.

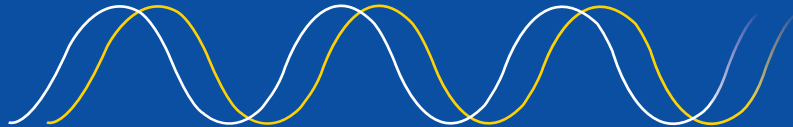
The primary difference between the three geometries is in the placement of the feed. There are both advantages and disadvantages for each feed placement. They relate to electromagnetic performance, range use and the ability to optimize a Compact Range Reflector for an existing facility.

MI Technologies is the leader in Compact Range design. We will work with you to optimize a selection for your unique requirements and preferences.

All of the standard offerings shown in the following tables have serrated edge treatments. Models with rolled-edge treatments and custom models are available. Typical customizations include specially sized reflectors or edge treatments to address specific electromagnetic performance requirements.

Family of Center Fed Reflectors				
Model	Test Zone Size	Test Zone Shape	Frequency Band of Operation	Focal Length
501C	1 ft (0.3 m)	Cylinder	8.0 - 200 GHz	3 ft (0.9 m)
502C	2 ft (0.6 m)	Cylinder	4.0 - 200 GHz	6 ft (1.8 m)
503C	3 ft (0.9 m)	Cylinder	4.0 - 200 GHz	6 ft (1.8 m)
504C	4 ft (1.2 m)	Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
504CE	6 ft x 4 ft (1.8 m x 1.2 m)	Elliptical Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
505C	5 ft (1.5 m)	Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
506C	6 ft (1.8 m)	Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
508C	8 ft (2.4 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)
508CE	12 ft x 8 ft (3.6 m x 2.4 m)	Elliptical Cylinder	1.0 - 200 GHz	24 ft (7.3 m)
510C	10 ft (3.0 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)
512C	12 ft (3.6 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)

Family of Corner Fed Reflectors				
Model	Test Zone Size	Test Zone Shape	Frequency Band of Operation	Focal Length
502D	2 ft (0.6 m)	Cylinder	4.0 - 200 GHz	6 ft (1.8 m)
503D	3 ft (0.9 m)	Cylinder	3.0 - 200 GHz	9 ft (2.7 m)
504D	4 ft (1.2 m)	Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
505D	5 ft (1.5 m)	Cylinder	2.0 - 200 GHz	12 ft (3.6 m)
506D	6 ft (1.8 m)	Cylinder	1.5 - 200 GHz	18 ft (5.5 m)
508D	8 ft (2.4 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)
510D	10 ft (3.0 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)
512D	12 ft (3.6 m)	Cylinder	1.0 - 200 GHz	24 ft (7.3 m)



Family of Side Fed Reflectors

Model	Test Zone Size	Test Zone Shape	Frequency Band of Operation	Focal Length
502SE	3 ft x 2 ft (0.9 m x 0.6 m)	Elliptical Cylinder	3.0 - 200 GHz	12 ft (3.6 m)
503SE	4.5 ft x 3 ft (1.4 m x 0.9 m)	Elliptical Cylinder	3.0 - 200 GHz	12 ft (3.6 m)
504SE	6 ft x 4 ft (1.8 m x 1.2 m)	Elliptical Cylinder	2.0 - 200 GHz	18 ft (5.5 m)
506SE	9 ft x 6 ft (2.7 m x 1.8 m)	Elliptical Cylinder	1.5 - 200 GHz	24 ft (7.3 m)
508SE	12 ft x 8 ft (3.6 m x 2.4 m)	Elliptical Cylinder	1.0 - 200 GHz	36 ft (11.0 m)

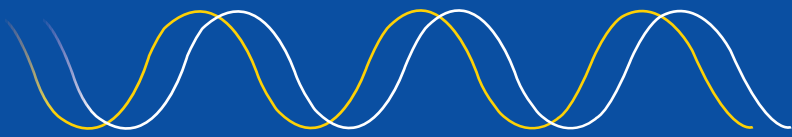
The performance of a compact range is defined by the variation of the amplitude and phase within the test zone. These variations are measured using a probe antenna mounted on a translational slide axis. The resultant measurement is a plot of received amplitude or phase versus distance along the line of travel. From these traces, performance metrics can be ascertained. The amplitude variation of the compact range test zone field is specified by amplitude taper and ripple. The phase variation in the test zone is specified by the deviation from a best-fit straight line through the data trace.

The field uniformity of a compact range is determined by the combination of feed and reflector. Different feeds with the same reflector can result in

significantly different test zone performance. MI Technologies' Compact Ranges are specified when used with one of the feeds in the MI-33 Series of Compact Range Feeds. When used with an MI-33 feed, the Compact Range Reflectors are specified to have less than 1 dB amplitude taper, typical, and less than +/-0.5dB amplitude ripple, typical, over the test zones called out above. The phase variation within the test zone is less than +/- 5 degrees below 18.0 GHz and +/-10 degrees from 18.0 to 100.0 GHz.

Over the wide frequency bands specified in the table and across each feed's bandwidth, performance can vary. Please contact MI Technologies for more information.

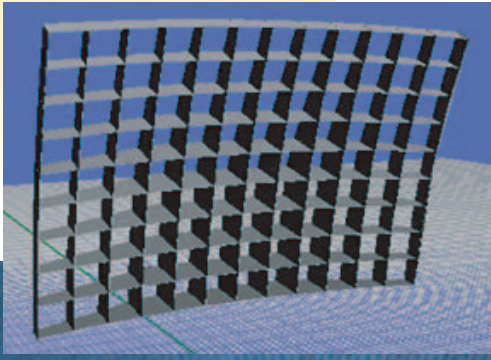
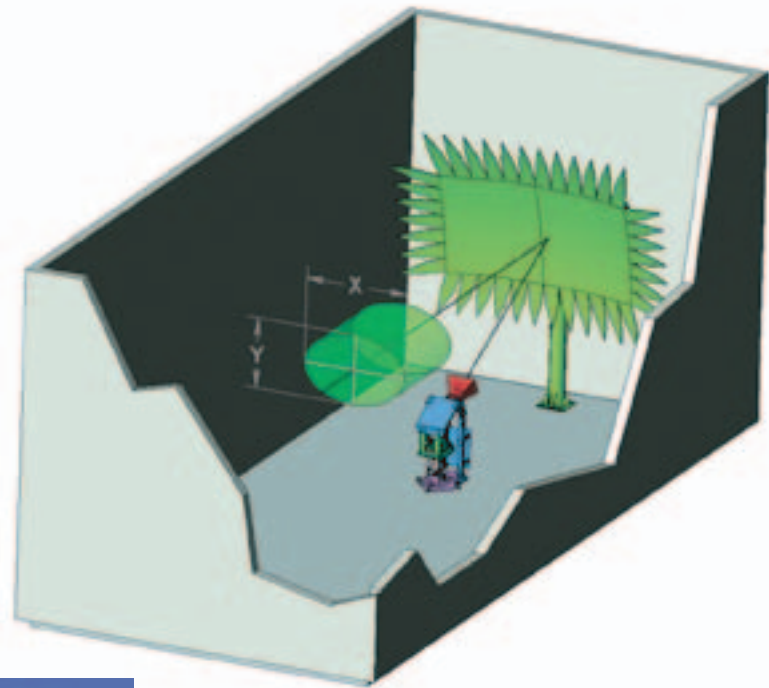




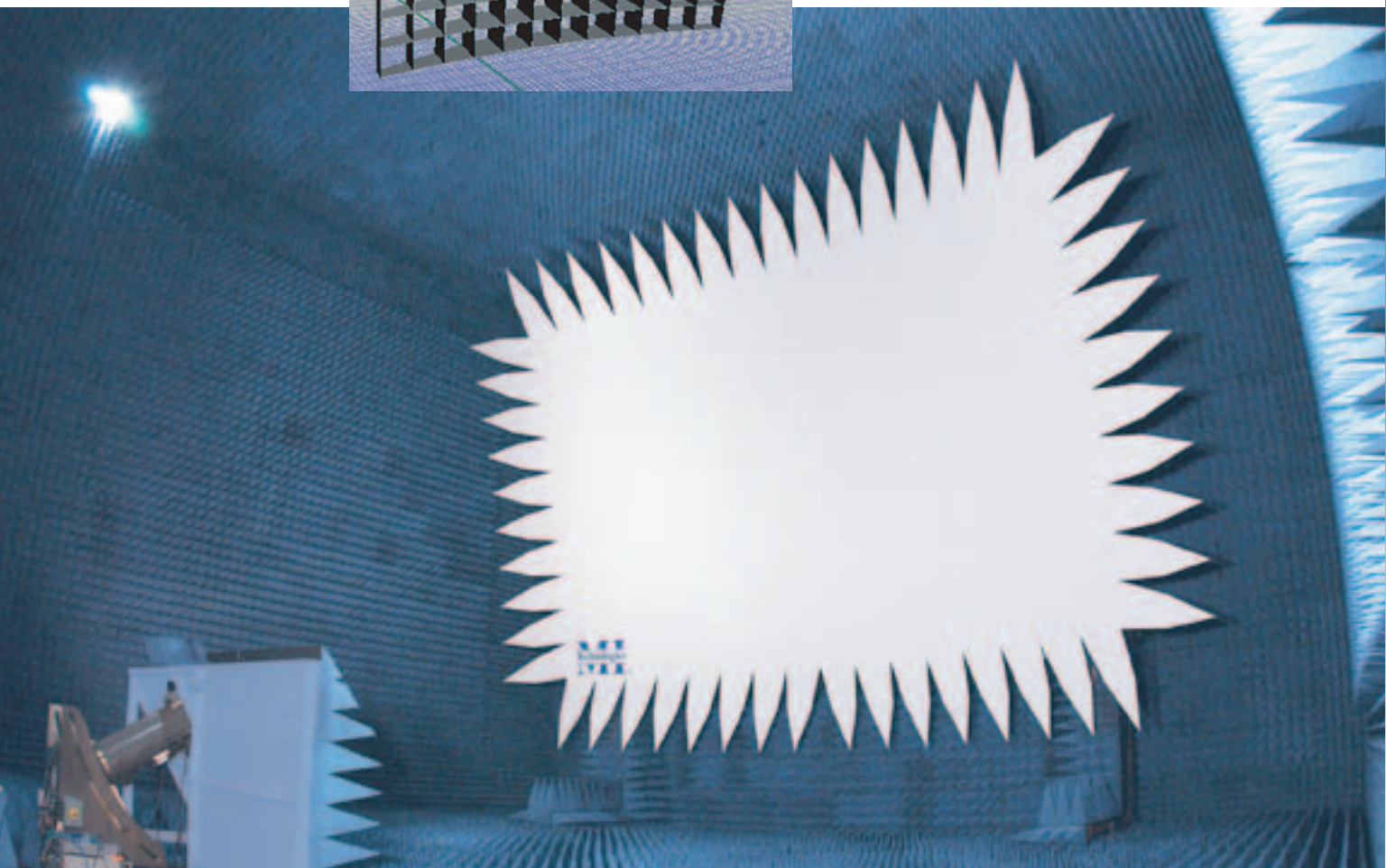
What is a Compact Range?

A Compact Range consists of a large offset fed reflector and a microwave feed horn to illuminate the reflector. Once properly aligned, a Compact Range will produce a plane-wave zone with minimal phase taper, minimal amplitude ripple and approximately 0.5 to 1.0 dB amplitude taper over the designed plane-wave zone.

The Compact Range's reflector is its most prominent feature. A feed horn antenna radiates a spherical wave from the focus of the reflector, which is collimated by the reflector to create a planar wave. The test zone of the reflector accurately simulates far-field conditions for an antenna or target under test.



Light in weight but stiffer than steel, these new carbon composite backup structures support the accuracies needed for maximum performance.



Why Choose a Compact Range?

Compact Ranges offer the best advantages of indoor testing with the economy and efficiency derived from use of a confined space.

Antenna, radome, and radar cross section testing can be performed outdoors in large far-field test ranges. However, testing is often adversely impacted by weather, time of day and security concerns.

Indoor testing offers a more flexible test schedule that is unaffected by weather conditions and the time of day. In an enclosed structure, security presents less of a problem.

The costs associated with the construction and maintenance of a large indoor facility for far-field testing can be prohibitive. As an example, a three-foot diameter antenna tested at 10 GHz will require a separation of 183 ft (56 Meters) between the microwave source and the antenna under test. An outdoor range would require a large, dedicated section of real estate to test this antenna. The cost of a large indoor test facility to house this range along with the volume of microwave absorber required inside would be prohibitive.

A Compact Range, in contrast, will allow the same antenna to be tested with just 18 ft (5.5 Meters) of separation distance - a ninety percent reduction. Use of a Compact Range makes the concept of an enclosed range practical to build and maintain.

Compact Ranges are ideal test facilities where indoor space considerations and economical testing requirements are paramount. Their flexible design, all weather installation and use in a wide variety of product test and measurement environments make the Compact Range the solution of choice for many test applications.

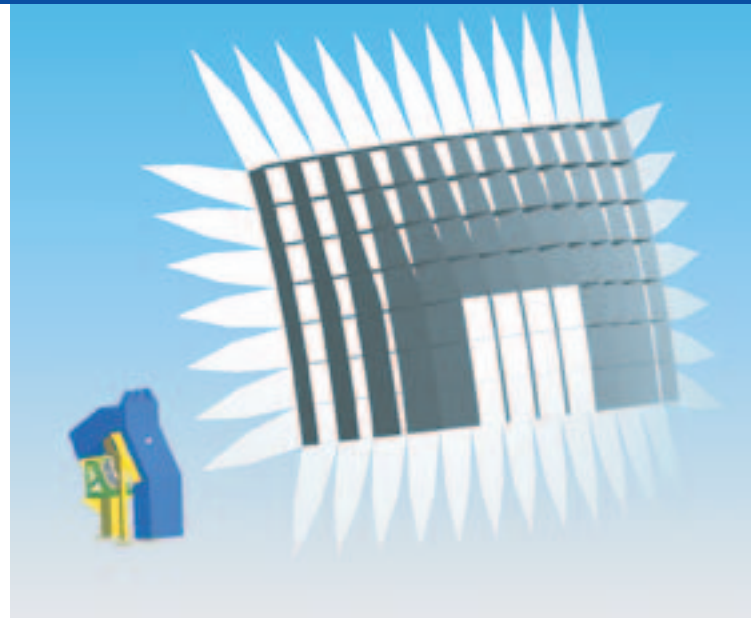
Compact Ranges typically are used in the following measurement scenarios:

Antenna Measurements

The Compact Range illuminates the test zone with planar phase fronts that are uniform in amplitude, while the response of the test antenna is monitored as a function of its rotation angle.

RCS Measurements

The transmit channel of the Compact Range illuminates the test zone with planar phase fronts while the scattered wave response of the target is monitored through the receive channel as a function of the target's rotation angle and of the microwave frequency.



Radome Measurements

The Compact Range illuminates the test zone with planar phase fronts while the response of an antenna is monitored - both before and after a covering radome is installed over the antenna. The radome's performance is assessed by comparing the 'before' and 'after' results as functions of turning angle and of the microwave frequency.

Tracking Measurements

The Compact Range illuminates the test zone with planar phase fronts while the response of a tracking system is monitored as the angle of arrival is varied. The tracker's performance is assessed by comparing the change in angle of arrival reported by the tracker to the true change in angle of arrival, brought about by a rotator underneath the tracker.

*For more information
contact MI Technologies at
1-800-854-3660 or visit us
online at www.mi-technologies.com.*

The export of the equipment or components thereof, described herein, or export of the technical data associated with such items, may require the advance approval of the U.S. Government.



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