

**OMEGA EP Construction:** The OMEGA Extended Performance (EP) project is continuing to make progress toward its completion milestone of FY08. Some of the level-II milestones completed in the last few weeks include (a) installation of the grating compressor chamber (GCC), (b) installation of the 3.3-m-diam target chamber, and (c) completion of the target area structure.

The GCC is a major part of the OMEGA EP Laser Facility. This structure (21.3-m long  $\times$  4.6-m wide  $\times$  4.6-m high) is designed to house the tiled-grating arrays (four grating arrays per beam) used to time-compress the two short-pulse beams at the output of the laser. A large, full-access door is located at one end of the chamber to allow entry and the installation of the gratings and support structures. For ease of assembly, the chamber was constructed and shipped in seven sections. All seven modules, the end caps, and the moving, 10,000-lb (4,535 kg) door were installed and activated in October 2005. The 350,000-lb (158,757 kg) vacuum vessel, located in the northwest corner of the OMEGA EP Target Bay, is scheduled to be vacuum tested in December 2005. Figure 1 shows a view of the GCC after installation.

To ensure maximum diagnostic flexibility, the OMEGA EP target chamber is matched in size to the OMEGA target chamber and will be outfitted with three OMEGA ten-inch manipulators. Both chambers have a diameter of 3.3 m. For purposes of configuration flexibility, the OMEGA EP target chamber has a total of 93 laser-beam and diagnostic ports (see Figs. 1 and 2).

The OMEGA EP target-area structure provides a stable mounting platform for the target chamber. This structure is also designed to suspend the beam-transport optics and provides interfaces for various diagnostics. The 7.6-m-high structure is constructed with a combination of large (8 in.  $\times$  10 in.) vertical box beams, 8-in. horizontal I-beams, and constrained layer-damped shear panels. The shear panels provide efficient damping of the panel “drum-head” modes; constrained layer damping is incorporated into the panel design by sandwiching a layer of viscoelastic polymer between two sheets of steel. As the steel sheets flex, the viscoelastic layer is sheared providing a high level of damping.

**OMEGA Operations Summary:** OMEGA produced 141 target shots during November for the following users: LLE [82 shots, including 19 for the National Ignition Campaign (NIC)]; LANL (6 NIC shots); LLNL (38 shots, including 26 for the NIC and 12 for the HED campaign); and NLUF (15 shots). The NLUF campaigns included experiments for two collaborative teams headed by the University of California at Berkeley and the University of Michigan, respectively.



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Figure 1. View of the OMEGA EP Laser Bay with the GCC on the left and the target structure on the right. The target area structure encloses the OMEGA EP target chamber.



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Figure 2. View of the OMEGA target chamber nested within the target-area structure.