ITT

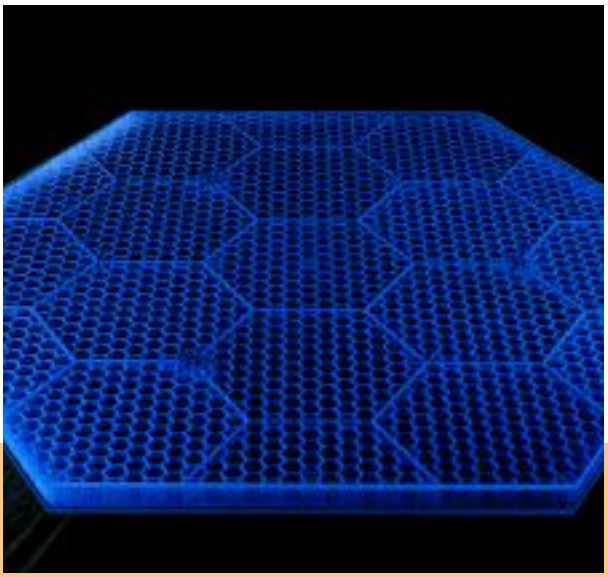
Ultra Lightweight Mirror Technology

Fabrication Capabilities Minimize Payload Mass

Leveraging 50 years of experience in innovative remote sensing solutions and deep space imaging, ITT has developed a technology that drastically reduces the weight of optical components. These capabilities make it easier to meet strict payload weight restrictions while producing high-quality mirrors that collect more information across the optical spectrum. The technology also makes ground testing faster and easier.

Using ITT's Ultra Lightweight Mirror Technology, it's now possible to design and fabricate large-aperture space-borne telescopes with a previously unheard of density-per-area ratio. For example, a mirror equivalent to the Hubble mirror, which has a mass of 1,600 pounds, can now be fabricated with a mass of less than 200 pounds.

ITT's capabilities take a mirror through every stage of its lifecycle, from design and fabrication through testing and verification. We have the expertise to identify and implement solutions that precisely meet your requirements. We can integrate these solutions into your existing imaging systems. And we can provide consulting services to help you achieve total mission success.



Key Features

- **Reduces the payload mass of large-scale mirrors by a factor of 10:1 or greater.**
- **Produces high stiffness for easy, accurate testing and tuning on the ground.**
- **Uses glass to reduce expenses and manufacturing time.**
- **Enables larger effective telescope apertures, collecting more information over a wide range of the optical spectrum.**
- **Provides medium authority, so the optical element requires less on-orbit correction. This means fewer actuators, requiring less weight and power, and fewer degrees of freedom in the wavefront sensing/control systems.**

Ultra Lightweight Mirror Technology

Unsurpassed Imaging Solutions

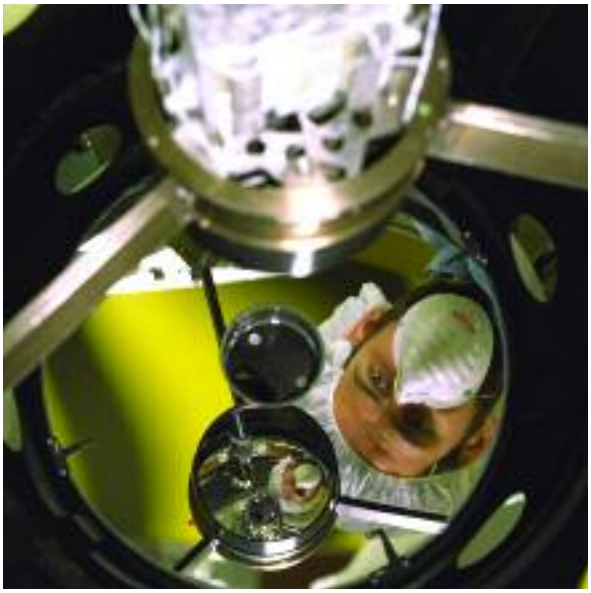
ITT's Ultra Lightweight Mirror Technology adds a new dimension to remote space exploration. Drawing on our huge database of imaging and remote sensing knowledge, we can quickly integrate our imaging innovations with your requirements and applications in order to help shorten deployment times and ensure your mission success.

FEATURES:

- Computer-controlled abrasive water jets to cut glass for extremely thin core structures, e.g., 0.6 mm geometric core struts.
- Low-temperature fusion bonding of ultra-thin plates to provide the properties and temporal stability of conventional fusion-welding with only one-third the weight.
- Off-axis grinding via computer-controlled systems and high-precision laser interferometers to produce surfaces within ten microns of the final figure requirements.
- The latest deterministic control algorithms to correct figures to within a fraction of a wavelength.
- Ion figuring that removes material at the atomic level, converging on optical figures to meet design specifications.

BENEFITS:

- Reduces payload mass
- High stiffness
- Lower costs
- Faster fabrication
- Larger telescope apertures
- Fewer on-orbit corrections



Using Ultra Lightweight Mirror Technology, ITT developed this 1.4 meter hex mirror, proving that a very lightweight mirror can be extremely rigid and provide superior quality optical performance while being cost-effective to design and fabricate.

ITT provides a full range of remote sensing solutions. Learn more at www.ssd.itt.com

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