

BARR'S ASTRONOMICAL FILTERS

Overview

Barr Associates, Inc. is the world's largest independent designer and manufacturer of precision thin film coatings and optical filters. We are one of the pioneers and the strongest manufacturers of Astronomical filters. Barr's breadth and depth of coating technologies are from 200nm to over $50\mu\text{m}</math>. Barr has 70 active deposition systems using the widest range of coating technologies in the industry. Barr Associates, Inc. has a long and successful track record of customizing design and manufacturing processes to meet the most challenging specifications.$

Barr's Heritage in the Astronomical Community

Barr has been a major supplier of optical filters for the astronomical community worldwide for **over 35 years**. We have developed and manufactured filters and filter sets for a large variety of **high profile ground based astronomical projects and events**, and **for major telescopes globally**, some of which are listed below.

- HALE-BOPP Comet filter set (Lowell Observatory)
- ISAAC and SOFI programs (ESO)
- NIRSPEC Camera filter set (UCLA-KECK)
- GONG project (AURA)
- ISOON pre-filter set (NSO-AURA)
- Large CCD Mosaic Camera filter set (CFHT)
- CONICA project (Max Planck)
- 14" square H-Alpha filter on a single substrate (AAO)
- Sloan Digital Sky Survey Keck Interferometer IR reflector filter (JPL)
- Pan-STARRS (University of Hawaii)

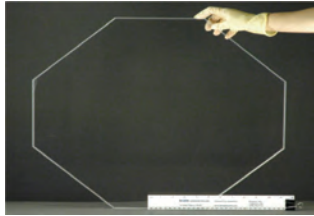


Our successful participation in these programs through the years has allowed us to develop and strengthen relationships with leading observatories, telescope manufacturers, universities, research centers and governmental agencies from all over the world. In addition, Barr has participated in over **100 space programs**, providing filters currently used on board the **Hubble Telescope**, in each of the Mars missions (including **Spirit** and **Opportunity**) as well as **Spitzer**, **Cassini** (Saturn), **Galileo** (Jupiter), **AEM-2** (Stratospheric Aerosol Gas Experiment), **SPOT 3** (Polar Ozone Aerosol Measurement), **SOHO**, **SOLSE-2**, **PICASSO-CENA** (later **CALIPSO**), **Solar-B** (Solar Terrestrial Probe), **SIRTf**, **UK-DCM**, **XMM**, **VCL**, **TIMED**, **Meteor 3M**, **Contour** (Comet Nucleus Tour), **Deep Impact**, **HST**, **SWIFT** (Gamma-ray Burst Mission) and Ralph/MVIC and Alice (on board **New Horizons**).



Barr's Capabilities in Designing and Manufacturing Filters for Science and Astronomy Applications

What distinguishes Barr in the Science and Astronomy marketplace is our strategy of **customizing every job to the customer's specifications**. We accomplish



this by selecting and dedicating the appropriate engineering resources upfront to **interact directly with the customer**.

This partnership approach has allowed us to become an extension of the customer's design and engineering team whereby we are working collaboratively to provide the best solution for our customers.

Barr has a wide range of capabilities from ultraviolet (<200nm) to the far infrared (50 μ) to design and build custom versions of the UVRI set, the JHKLM-band set, H-Alpha, OIII and comet filters. It also leverages its special capabilities to manufacture multi-band arrays, multi-cavity designs and sub-angstrom bandwidth filters. Barr has recently brought on line capabilities to coat astronomical filters up to 30 inches in diameter.

With every job, a customer of Barr receives the added benefit of Barr's deep experience base and expertise in designing and manufacturing precision optical filters for over 35 years across all major markets. We have had significant success in leveraging **simple solutions to complex problems through the development of strong relationships with our customers**. We have come a long way from such beginnings to become the world leader in providing differentiated precision thin film coating solutions and filters. Barr has **more than 70 active deposition systems using the widest range of coating technologies in the industry**. We service the leading players and innovators in virtually every major market where optical filters or thin film coatings are enabling technologies or components. Our manufacturing capabilities and capacities allow us to service all types of

orders with agility, ranging from small prototype work to high volume jobs.

these assets to produce some of the most innovative products and solutions in the industry, including:

- Coatings for deformable mirrors
- Large area coatings (up to **30 inches in diameter**)
- Patterned filters Linear variable filters
- Rugate filters

Barr's Commitment to the Science and Astronomy Markets

A hallmark of Barr's reputation is our **unwavering commitment to our customers' success**. We have maintained strong relationships in all the various markets that we "ups and downs" of each of the industries. We have a dedicated team of engineers and manufacturing facilities to service the needs of the Science and Astronomical community. We intend to **continue developing and investing in our design and manufacturing processes as well as bringing the overall Barr capabilities to strengthen our position in the Science and Astronomy markets**.



Barr's Unmatched History

Edgar Barr, who founded Barr Associates, Inc., was a pioneer in thin film filters. Edgar started in the industry in the 1940's and set up a thin film laboratory at Polaroid. He established Barr Associates, Inc. in 1971 to provide band pass filters to the scientific

community, which was in need of high performance filters and a moderate cost. By working directly with the customer's Edgar assisted in optimizing the customer's objectives regarding performance, quality and cost. His character laid the cornerstones of Barr's culture of seeking simple solutions to complex problems through the development of strong relationships with our customers.

BARR

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Relationships Through Technical Excellence and Integrity

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