

BURLE UPDATE

BURLE INDUSTRIES, INC. – Electron Tube And Electro-Optic Products Newsletter

Try Our NEW Online Photomultiplier Selector

Now there's an easy way to find the right photomultiplier for your detection applications. BURLE's new advanced online photomultiplier selector provides the ultimate convenience in selecting a tube that matches your specific physical or performance requirements.



The new selector offers three ways to search our large database of photomultipliers; the first is by the BURLE part number (i.e. 8575); the second by application (i.e. low light measurement, Spectrophotometry, etc.); and the third method is by physical and performance characteristics (i.e. 3" hex tube with a spectral range of 300-700.)

With just a few clicks you'll find the right tube along with its comprehensive data sheet. Plus, many of our tubes are available for purchase online through our exclusive shopping cart. Visit www.burle.com and click on "Photomultipliers".

Cryogenic Version of the PLANACON™

BURLE announces the addition of the 85006-600 PLANACON™ PMT to its family of low profile MCP-PMT products. This new PMT is designed specifically to be used at cryogenic temperatures. It also has low intrinsic radioactivity making it attractive for rare event detection in liquid noble gas scintillation counting.

BURLE's newest PLANACON™ fits well in many of today's hot physics applications, including cold dark matter, solar neutrino, and double beta-decay experiments. Homeland security and DOD (Department of Defense) applications requiring low radioactivity sensors will also benefit from both the 85006 and other models of the PLANACON™ family.

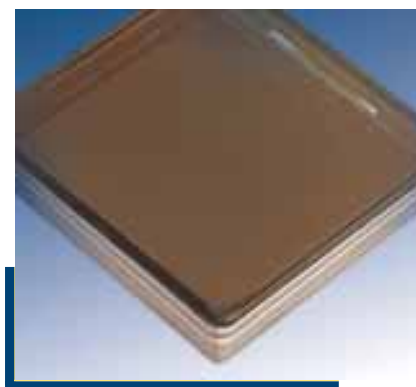
The 85006-600 PMT has a bi-alkali photocathode processed to have low resistivity, allowing operation at cryogenic temperatures, including that of liquid Helium. The novel ceramic-metal body and Indium-sealed fused silica faceplate have been proven to withstand multiple cycles to cryogenic temperatures without loss of vacuum integrity. The fused silica faceplate provides good UV sensitivity (transmission), and together with the bi-alkali photocathode is well matched to the spectral emission of most liquid noble gas scintillators.

Another unique feature of the entire PLANACON™ family is their relatively low level of intrinsic radioactivity. This is accomplished because very little standard glass is used in its construction, resulting in low levels of Uranium, Thorium, and Potassium.

The low profile 85006-600 has a 2-inch square active area and can be tiled for efficient coverage of large area detectors. The 85006-600 is constructed with four 1-inch square anodes, providing coarse position resolution. (Other anode configurations are available on request.) The performance of the 85006 is comparable to other PLANACON™ PMT models, and exhibits excellent timing properties, good gain, high pulse linearity, and excellent immunity to magnetic fields. Response uniformity over the full 2-inch active area is exceptional, with the cathode uniformity typically better than 10%, and an anode uniformity of 1.5:1 in linear mode.

The 85006-600 is provided with no external coatings or circuitry to allow custom packaging by customers, especially those with demanding cleanliness requirements. The AJ2349 is a temporary voltage divider network and handling fixture providing ease of testing prior to installation into a cryogenic detector system. BURLE also offers the PF1056, a high voltage power supply optimized for use with the PLANACON™ family.

For additional technical information visit www.burle.com or call 1-800-366-2875; 1-717-295-6888.

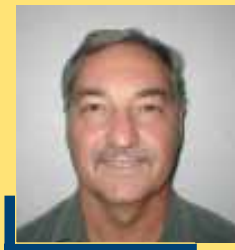


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A Word From BURLE's GM of BURLE Mexico

In today's global economy, meeting customer demands in new ways while controlling costs without sacrificing quality is imperative. Mr. Larry Place, General Manager of BURLE Mexico, has successfully balanced these goals for BURLE INDUSTRIES' customers.



Mr. Larry Place

Several years ago, BURLE INDUSTRIES decided to reduce costs of its photomultiplier tube components to remain competitive by adding a manufacturing facility in Mexico. BURLE's penchant for high quality standards required a different approach. Enter Mr. Larry Place. With an extensive quality control background with GE and BURLE, he was a perfect fit.

Although the plant, located just 5 miles from Brownsville, Texas, began with the manufacture of PMT "metal socket mounts", it's now also involved in the technically complex fabrication and assembly of the surrounding glass tube. Mr. Larry Place points out, "To make the process fit BURLE's quality standards, an investment was made to procure automated glass sealing lathes. These machines are the latest and most advanced of any offered in the world. With this new capability, there is dramatically higher repeatability thanks to absolute heating positioning and temperature control."

With technological advancements in a country where electricity does not always cooperate, BURLE needed to bolster its power source. So, a plant-wide UPS (Uninterruptible Power Supply) System was added to assure electrical demand and standards were met.

Proudly, Mr. Place and his team have achieved a huge goal in being one of the few companies located in Mexico that have received NSAI's highest quality certification ISO 9001:2000 in April of 2003.

BURLE. Helping to Discover the Future.

Medical PET Scanner Manufacturers Select BURLE PMT's

When manufacturers of advanced medical PET (Positron Emission Tomography) scanners look for a partner to supply PMTs for their equipment, they turn to BURLE INDUSTRIES.

BURLE photomultipliers capture bursts of light caused by the collision of gamma rays from radioisotope from the patient's body with a crystal detector. This pulse of light is amplified by the photomultiplier and the information then sent to the computer which controls the apparatus.

BURLE offers a wide range of PMTs for PET applications. This product family has grown to include the following tubes designed to fit specific size and performance characteristics of PET manufacturers:

83112 25.4 mm round, 10 stages, head-on type, low profile photomultiplier tube especially for PET scanners. Spectral response is 300 to 660 and offers superior PHR, and fast time response.

83120 is a new low profile 28 mm head-on PMT with a bi-alkali photocathode having high sensitivity, high gain, and very good timing characteristics. It is intended for use in a wide variety of applications especially for scintillation counting. It is socket compatible with the majority of 28 mm head-on tubes currently available.

83087 19 mm diameter end-window PMT with an IO-stage linear focused alkaliantimonide dynode structure, bi-alkali photo-cathode, and semi-flexible leads. The PMT features high QE (typically 27% at 370 nm), high gain and compact size. It is well suited for photon counting, especially for positron emission tomography (PET) scanners, and other scintillation detection applications.

83115 New 50.8 mm round PMT with Plano-Concave faceplate, providing very good timing along with good PHR. Call BURLE for more information.

85011 The 85011-501 PLANACON™ assembly is based on a new photomultiplier tube that utilizes microchannel plates (MCP) for electron multiplication. This square head-on MCP-PMT is less than one inch thick including the integrated voltage divider network. Its sixty-four anodes provide 6 mm position resolution when used as a discrete pixel device. This tube is ideal for small, high performance PET systems.

BURLE Joins AMI

BURLE recently joined The Academy of Molecular Imaging. BURLE's increasing involvement in designing and manufacturing imaging devices i.e. photomultipliers (*see above story*) for PET scanners makes it important for BURLE to be more involved to assure its product development efforts are in lock-step with the industry's needs.

ASMS Review

The 2003 Annual ASMS Conference in Montreal was a great opportunity for BURLE Electro-Optics to showcase a host of new detection products. Along with the company's standard offerings, new 40 mm large format Advanced Performance Time-of-Flight and Bipolar Time-of-Flight detectors were displayed (*see inside for related story.*) These new detectors now provide BURLE customers a complete product range (17 different models) with 18 mm, 25 mm and 40 mm versions of BURLE's high performance small pore MCP Technology.

Also at the show, BURLE's exciting new line of Conductive Glass products was introduced for the first time. A high level of interest was generated from booth visitors in the use of BURLE's custom capability to meet the needs for producing Ion Guides and Reflectron Lenses that provide better performance characteristics not available until now (*see inside for related story.*)

NEW! Gated Versions of 85104 PMT

BURLE INDUSTRIES announces availability of two new gated versions of its 85104



Microchannel Plate Photomultiplier; the 85104 540 and 85104 550.

The 85104 540 requires an external high voltage pulser (available from BURLE) and offers fast gate-on times (<5 ns) with a repetition rate of up to 10,000 Hz, and on-times from 100 ns-10 microseconds. The 85104 550 has an internal high voltage gate source and does not require an external high voltage pulser, making it very user friendly.

Both 85104 models allow users to control its on/off state via a TTL input. Benefiting from this capability are applications such as LIDAR and fluorescence microscopy where light levels are significantly lower than the excitation light level. Through the 85104's gating, light saturation can be prevented to allow critical measurement of the lower light level.

The new 85104 models incorporate a unique semitransparent gallium-arsenide photocathode providing quantum efficiencies of greater than 20% from 370 nm through 850 nm with peak efficiency of 30% at 700 nm. This outstanding response is obtained over a large 18 mm diameter photocathode with a dark count rate of less than 200 cps.

The 85104 540/550 MCP-Photomultiplier is offered with an integral voltage divider network for ease of use and requires a high voltage source, of up to -3600 V, which can be provided by BURLE's PF1056 High Voltage Power Supply.

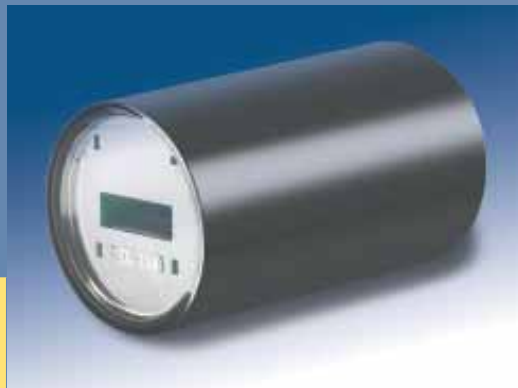
C31034 PMT – Legendary Performance. Unsurpassed Detection.

Are you getting the most from photon counting instruments? If you're not using BURLE's 2-inch, End Window C31034 PMT you may not know what you are missing. The C31034 PMT offers the highest detected quantum efficiency and dark counts less than 12 cps, the best available today.

The C31034 Series is designed specifically for use at reduced temperatures, e.g., -30 °C. When cooled to such temperatures, these tubes are highly useful in photon counting applications such as Raman, fluorescence spectroscopy and astronomy. Cooling reduces dark noise to a minimal value and allows taking full advantage of the performance capabilities of the tube.

Whether it's Raman, fluorescence spectroscopy or astronomy, you should consider the C31034 Series of PMTs to get the most from your instruments. Select from a range of tubes that meet your specific performance requirements. It's no wonder that the C31034 is the preferred choice by users across the world.

Call BURLE sales at 1-800-366-2875 for more C31034 PMT information or visit www.burle.com



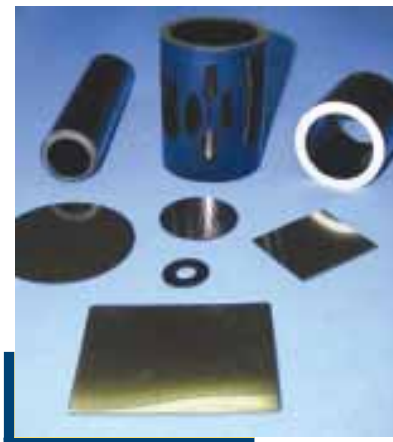
N E W P R O D U C T S S E C**NEW! Conductive Glass Products from BURLE**

BURLE Electro-Optics' Conductive Glass products offer a unique and low-cost capability for analytical instrument designers and manufacturers. Products are constructed of a single piece proprietary lead silicate glass that has been doped to produce a resistive surface. The resulting devices can be custom designed with one or more conductive areas based on designers' specific requirements. Conductivity can be varied over three orders of magnitude in order to optimize current flow and electric field strength.

Typical Conductive Glass applications include Ion Guides, Voltage Dividers, Conversion Dynodes, Ion Mirrors, Reflectron Lenses, Drift Tubes for Ion Mobility Spectrometers and more.

BURLE's Conductive Glass products are available in both tube and sheet form customizable to a variety of shapes. Electrodes can be either nichrome or gold. In addition, mechanical interfaces such as flanges, grids and meshes are available.

For additional information visit www.burle.com or call 1- 800-648-1800.

**Large Format Advanced Performance and Bipolar Time-of-Flight Detectors Introduced**

Adding to its line of Advanced Performance and Bipolar Time-of-Flight Detectors, BURLE Electro-Optics announces the addition of 40 mm diameter detectors to its current line of 25 mm and 18 mm devices. With these new entries, BURLE customers now have the widest selection of detectors with 17 available models and the largest size variation from 8 mm – 40 mm.

The new, 40 mm low profile detectors offer a collection area that is 2.5 times larger than the 25 mm version. The small pore MCPs result in a much faster detector, up to ten times faster than standard detectors. The MCP is housed in BURLE's Quick-Fit® Replacement Cartridge for fast maintenance and less downtime.

Not only do the new Bipolar Time-of-Flight detectors have a larger collection area, but they are also faster than 18 mm versions. The large format Advance Performance Time-of-Flight detectors are retrofittable with existing mount footprints allowing all existing sizes (18 mm and 25 mm) to be upgraded easily.

KEY PERFORMANCE CHARACTERISTICS INCLUDE:

Gain at 2400 V (Min)	1.0 x 10⁷
Dark Count (Max)	5 cps/cm²
Rise Time (Typical)	300 ps
Pulse Width (Typical)	1.2 ns
Operating Temperature	-50° to 100 °C



BURLE's 40 mm detectors can be ordered with an optional SMA output connector for easier installation and less possibility of an impedance mismatch or noisy connection. A 6-inch conflat mounting flange is also available.

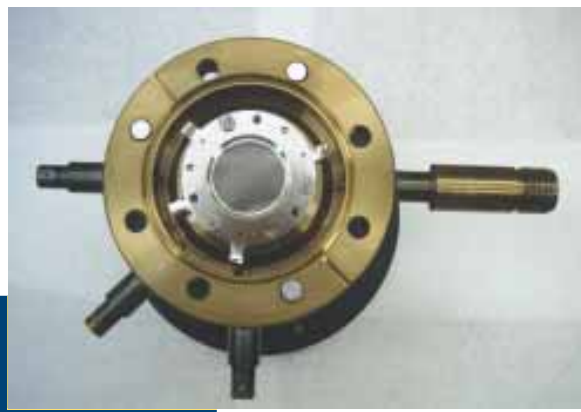
With the addition of its new 40 mm detectors, BURLE customers have single source access to a complete range of the highest temporal resolution detectors available for both ADC and TDC based systems. With its state-of-the-art production facility, BURLE can meet customer volume requirements at a quality level that surpasses any other source.

Visit www.burle.com for more technical information.

Visualize Charged Particles and UV Radiation

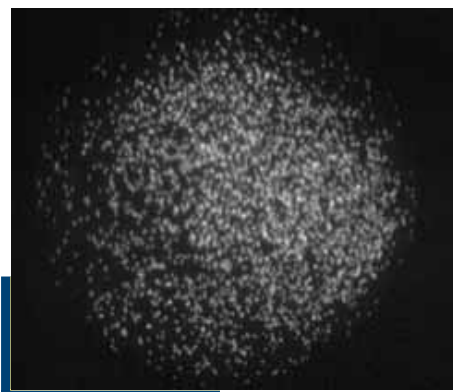
BURLE Electro-Optics introduces its NEW Electronic Imaging Detector designed to provide digital visual images of charged particles and ultraviolet radiation.

This detector system was designed to allow experimenters and designers to determine the location, shape, and size of a charged particle or UV beam. It is ideal for beam profiling in instrument design and high-energy physics experiments.



Electronic Imaging Detector

The detector consists of a 25 mm active diameter Microchannel Plate Chevron™, mounted on a conflat flange that detects and amplifies ion or photon events by producing a shower of electrons in the position of the input event. The resultant shower of electrons is converted to an optical image then captured by an integral CCD camera and sent to a frame grabber to archive frames from the image. The system includes the detector assembly with the CCD camera already mounted, the frame grabber board (for installation into your PC), and software.



Optical Image of Electron Positioning

Significant Price Reduction in Popular PMT

Thanks to a new manufacturing method, we have introduced a variant of our popular 8575 PMT end window transmission tube. Model 8575B uses a Borosilicate window versus conventional Pyrex, reducing the price to \$299—a savings of over 50%!

The new 8575B PMT tube is intended primarily for use in pulse counting applications and features high quantum efficiency, high current amplification, low dark current, and fast timing characteristics.

It is available immediately either online at www.burle.com or by calling BURLE sales at 1-800-366-2875



Companion Voltage Divider Network

The AJ2336 VDN assembly is designed specifically for PMT models 8575, 8575B and C31000, both 2-inch 12 stage PMTs. This VDN is packaged in a metal housing with an SHV connector for the high voltage and a BNC connector for the anode signal. It is available for use with positive or negative high voltage.

BURLE

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VISIT BURLE AT THESE EXHIBITIONS:

Microwave & High Frequency Heating Conference Sept. 2-5, 2003

IEEE Nuclear Science Symposium

Oct. 19-25, 2003 Booth 311

SPIE's Photonics East Oct. 27-31 2003 Booth 225

SPIE's Photonics West Jan. 27-29, 2004 Booth 3005

Pittcon March 7-12, 2004

SPIE's DSS April 12-16, 2004

NAB April 17-22, 2004 Booth C5306

BURLE Manufacturing Facilities Receive Highest Quality Certification

BURLE Electro-Optics, located in Sturbridge, MA and BURLE Mexico, located in Matamoros, Mexico have joined BURLE INDUSTRIES in receiving the ISO 9001:2000 certification for their quality systems. Certification was granted by the National Standards Authority of Ireland (NSAI).



Burle Mexico Facility

E-Newsletter Sign-up

Now you can receive this newsletter in an e-mail version. Simply send an e-mail with the word "E-Newsletter" in the subject line to burlesls@burle.com and you'll be added to the list. If you no longer wish to receive this printed version, send an e-mail to burlesls@burle.com with the word "remove" with your name and address in the body.

More Power to You With BURLE's New 100 kW Power Tube

BURLE INDUSTRIES announces its latest magnetron, a 100 kW, CW (Continuous Wave), L-Band device. This fixed-tuned magnetron is designed to operate at either 915 MHz (S94608E100) or 896 MHz (S94607E100).

The new ceramic-metal constructed device continuously generates 100 kW of useful power at efficiencies of 85% or higher. It is magnetically focused, air & liquid cooled. Currently, the new device is being used in a

variety of industrial heating applications, from diamond deposition to drying of organic materials, and food processing.

This latest device extends the range of the existing BURLE magnetron product line. BURLE offers magnetrons that provide continuous reliable power from 30 to 100 kW, at L-Band, and 30 kW at S-Band.

