



vision  
without  
limits

**BIOTECH**

# **CANTY**

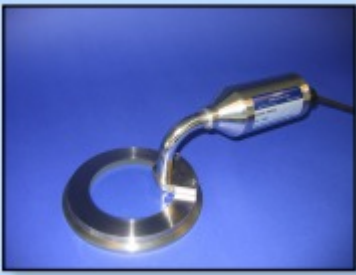
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## **PROCESS TECHNOLOGY**

**BUFFALO**

**DUBLIN**

**THAILAND**



# SANITARY LED LIGHTING

## APPLICATIONS

- Biotech Applications
- Fermentors
- Food Applications
- Sterile Process Applications
- Sanitary Areas

## FEATURES

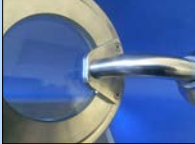
- Meets ASME/BPE Standards
- 316L and Hastelloy® Materials
- NEMA 4X / IP66
- Cold light, high output LED
- Fused glass - Safe Light
- CIP/SIP Process Compatible



HYL 52 LED Lighting System

Large, reflection-free lighting with rugged fiber optics

The CANTY PureView™ is a sanitary / hygienic fiber optic LED light and fused sight glass combination. The PureView™ combines the maximum viewing area through a CANTY FuseView™ sanitary sight glass with a CANTY high output LED light, providing the best view possible while minimizing space and connections.



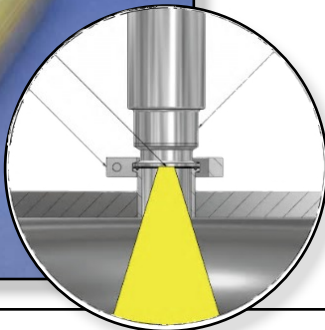
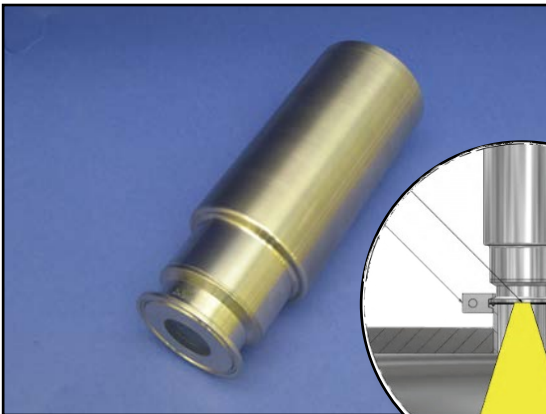
Unique bracket maintains contact to eliminate reflection



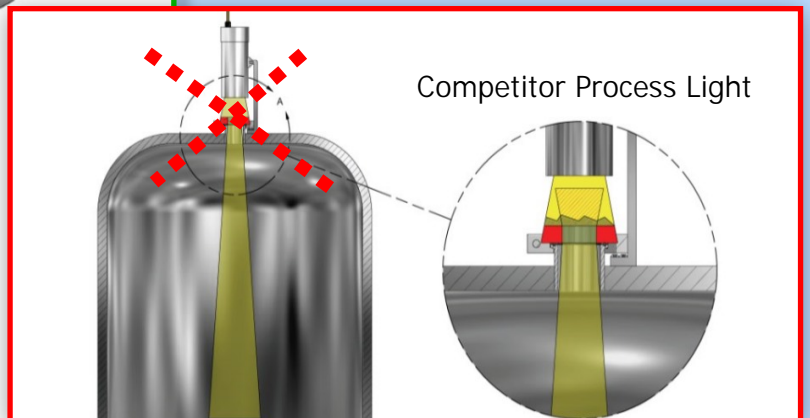
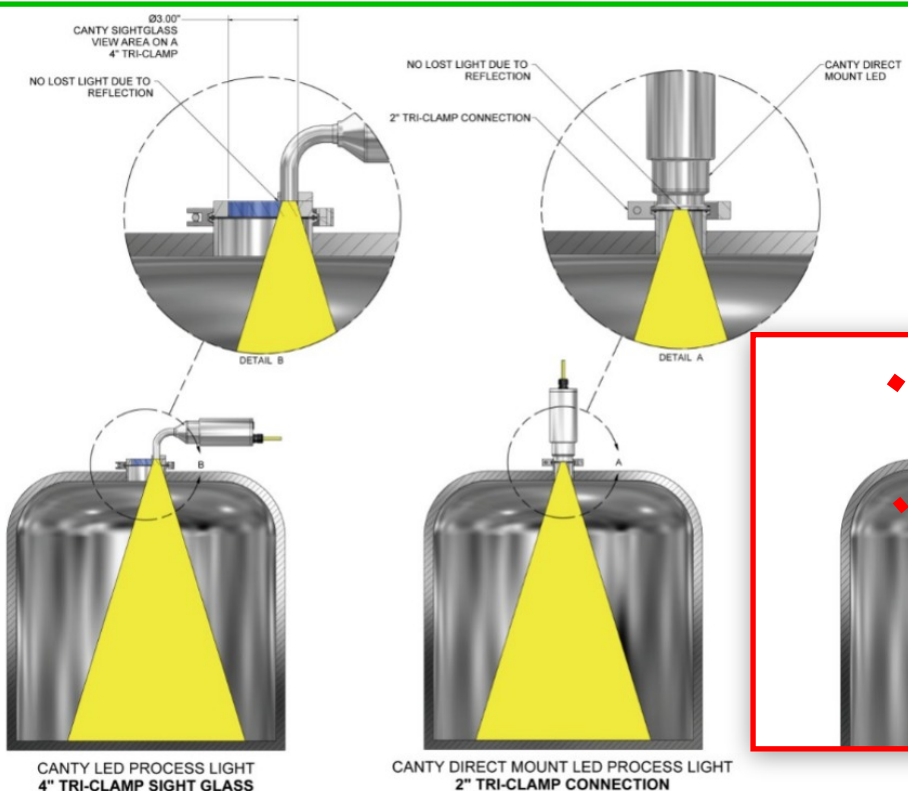
All CANTY LED lights feature a hermetic, fused glass, high pressure / temperature seal to completely seal the light from the process. The 316L SS or Hastelloy® design and variety of mounting connections make CANTY Lights ideal for any application.

## CANTY DIRECT MOUNT

- Directly connects to sight glass to maximize light introduced to the vessel (no gap that would result in light loss & material/dirt build-up).
- Compact hygienic design with integral fused glass mount (no additional sight glass needed)
- Low power consumption
- Extended Life (low-maintenance)
- Long Warranty
- Available in 2000 Lumens and 4000 Lumens
- For ordering information see TA11500-1007 and TA11500-1016.



## THE CANTY ADVANTAGE



CANTY LED PROCESS LIGHT  
4" TRI-CLAMP SIGHT GLASS

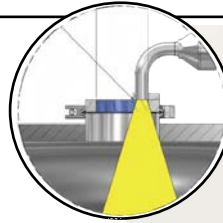
CANTY DIRECT MOUNT LED PROCESS LIGHT  
2" TRI-CLAMP CONNECTION



# SANITARY LED LIGHTING

## CANTY PUREVIEW™

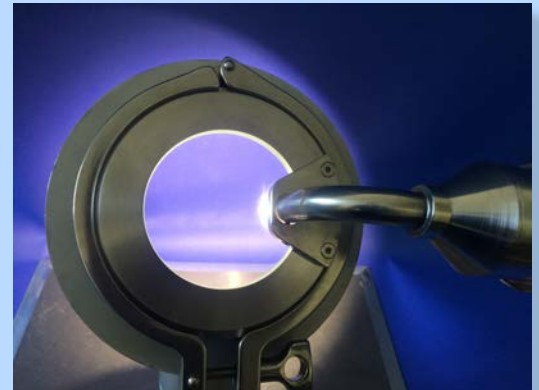
- Combination Light & Sight Glass
- Directly mounts to sight glass via a mounting bracket that is integral to the sight glass
- Light mounts flush on the sight glass via a fiber optic bundle (NO light loss)
- Ideal for smaller vessels where space is a premium
- Cost savings to all (reduce # of nozzles on vessel, reduced polishing costs, frees up space for additional instrumentation)
- For ordering information see TA9306-2



## PORTABLE VESSEL ILLUMINATION

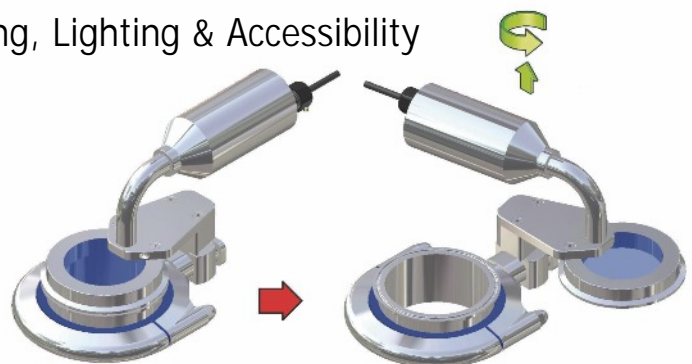
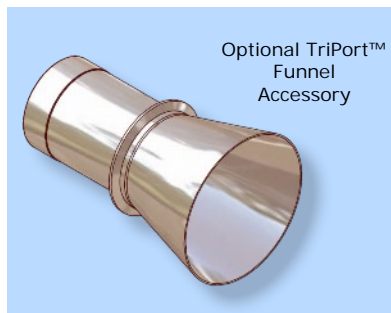


CANTY offers lighting solutions for clean room settings where electronics can be mounted in a mechanical room and kept isolated. Fiber optics are then utilized to transport light to a CANTY FuseView™ mounted on a vessel. An easy to use mounting bracket on the FuseView™ allows for a single light source and bundle to illuminate multiple portable vessels.



Bundle maintains contact with sight glass for ZERO light lost to reflection!

## CANTY TRIPORT™ - Combines Viewing, Lighting & Accessibility



# CANTY SANITARY SIGHT GLASSES & SIGHT FLOWS

PED ASME BPE

CANTY Sanitary FuseView™ sight glasses are fused, one-piece sight glasses, featuring a hermetic fused glass to metal seal. The CANTY high pressure, fused glass design requires no special gasketing or torque requirements. CANTY Sanitary sight glasses have been designed and tested to ensure the safest product available.

CANTY can provide certification of material and testing if required, following ASME code and TUV requirements for process vessels. FM approval is available on some models.



For More Information Click [Here](#)

## TRI-CLAMP® FuseView™



Available in full view and flush mount styles, the hermetic sanitary design is ideal for sanitary applications. CANTY features the largest viewing area of any fused sight glass on the market today.

## SANITARY FLANGE FuseView™



Incorporate a through hole bolt pattern in the sight glass, eliminating the need for a retaining flange. The low profile design and hermetic, fused seal provide a high strength, sanitary sight glass free of air pockets or pockets for material accumulation.

## ASEPTIC NA-CONNECT® FuseView™

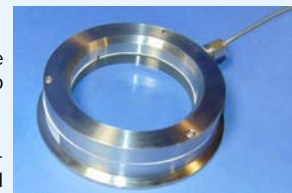


Designed for sanitary, CIP/SIP applications. The sanitary design eliminates air pockets and trapped material and is designed for full torquing. The cannot be over-torqued.

## HEATED TRI-CLAMP® FuseViewCF™



Designed for use with a heater to eliminate condensation from forming on the glass. Provides a high pressure, hermetic fused glass seal with additional mounting space for heating accessories.



## SANITARY SIGHT FLOWS



CANTY Sanitary sight flows are designed with the same attention to safety as industrial units. They are available with Tri-Clamp®, butt weld, TS, or any available sanitary connection.

## HOW IT WORKS

To manufacture a FuseView™ we heat the glass to it's molten point where it flows to the wall of the metal. At that point the glass fuses or bonds to the metal. Then we slowly cool the FuseView™ until the glass solidifies. The metal has a higher coefficient of expansion than the glass and the metal compresses on the glass. This squeezing prestresses the glass and puts it under radial compression. Glass is strong in compression but not under tension or shear. When the FuseView™ is pressurized the glass bends and relieves the compression and avoids tension. This is the same as is done with concrete - it is prestressed in compression in order to take bending.



## THE CANTY ADVANTAGE



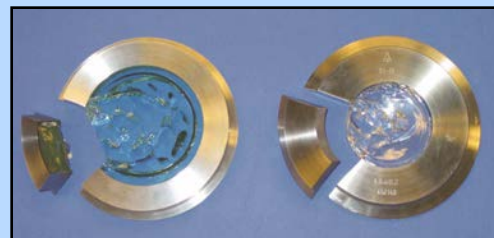
### CANTY

- Full 3.0" [76 mm] view (4" Tri-Clamp®)
- Hastelloy® C, Hastelloy® C276 and Hastelloy® C-22®

### Metal Glass

- 2.17" [55mm] view (4" Tri-Clamp®)
- DIN 1.4462 = Duplex SS NOT 316L SS

**CANTY provides the largest view possible!**



### CANTY

- CANTY model is hermetically fused. Note - glass is still fused to the ring after cutting.

### Metal Glass

- Not actually fused! Metal section breaks away cleanly.

(Comparable models shown cut with band saw)



# BIOCAM™ VESSEL CAMERAS



CANTY's process vessel cameras with integral light source allow for high quality remote viewing of a process vessel from the operator control room.

- Integral fiber optic guided lighting ensures uniform illumination in the viewing area.
- System hard-mounts directly to the process vessel, so it does not have any reflection issues.

- Percent Foam
- Verify empty
- Strobed LED Light
- NON-CONTACT Foam control
- Plastics & Resins

For More Information Click [Here](#)



## EYES IN THE PROCESS • VISUAL VERIFICATION • INTEGRAL LIGHTING

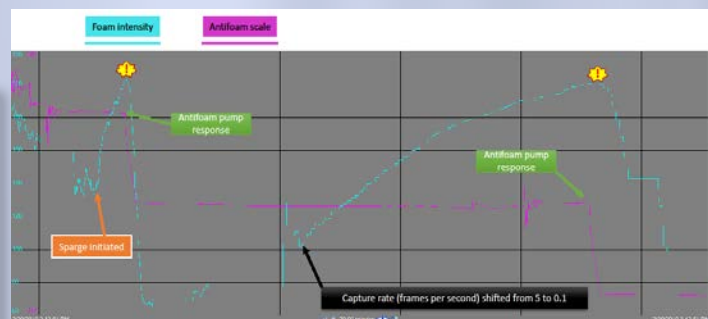
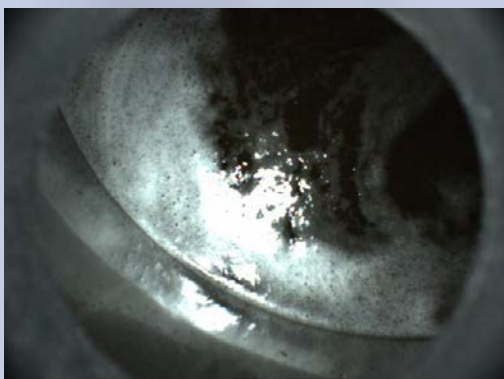
### EMPTY / LOW LEVEL



CANTY Camera & Light Vision Systems are a patented design to view and illuminate the inside of a pressure or process vessel through a single connection. There is no need for multiple ports! CANTY can supply an integrally mounted camera and light (optional) in flanged, sanitary or NPT threaded process connections. CANTY fused glass technology provides a safe, high pressure, hermetic fused glass barrier between the process and the camera electronics.

The key to CANTY Camera & Light Vision Systems is the CANTY LED Light. CANTY uses fiber optic light guides to focus cool, effective light into a process or pressure vessel. Cool light eliminates product bake-on, adding no heat to the process. Fiber optic light guides deliver the maximum amount of light into the tank. The resulting live, remote image from a CANTY Camera & Light Vision System is unparalleled!

### FOAM DETECTION



#### Capabilities:

- Liquid level detection
- Consistent foam layer control
- New antifoam feed strategy: cascade vs. bolus additions
- Increase understanding of foaming problems with qualitative data

# FERMENTATION

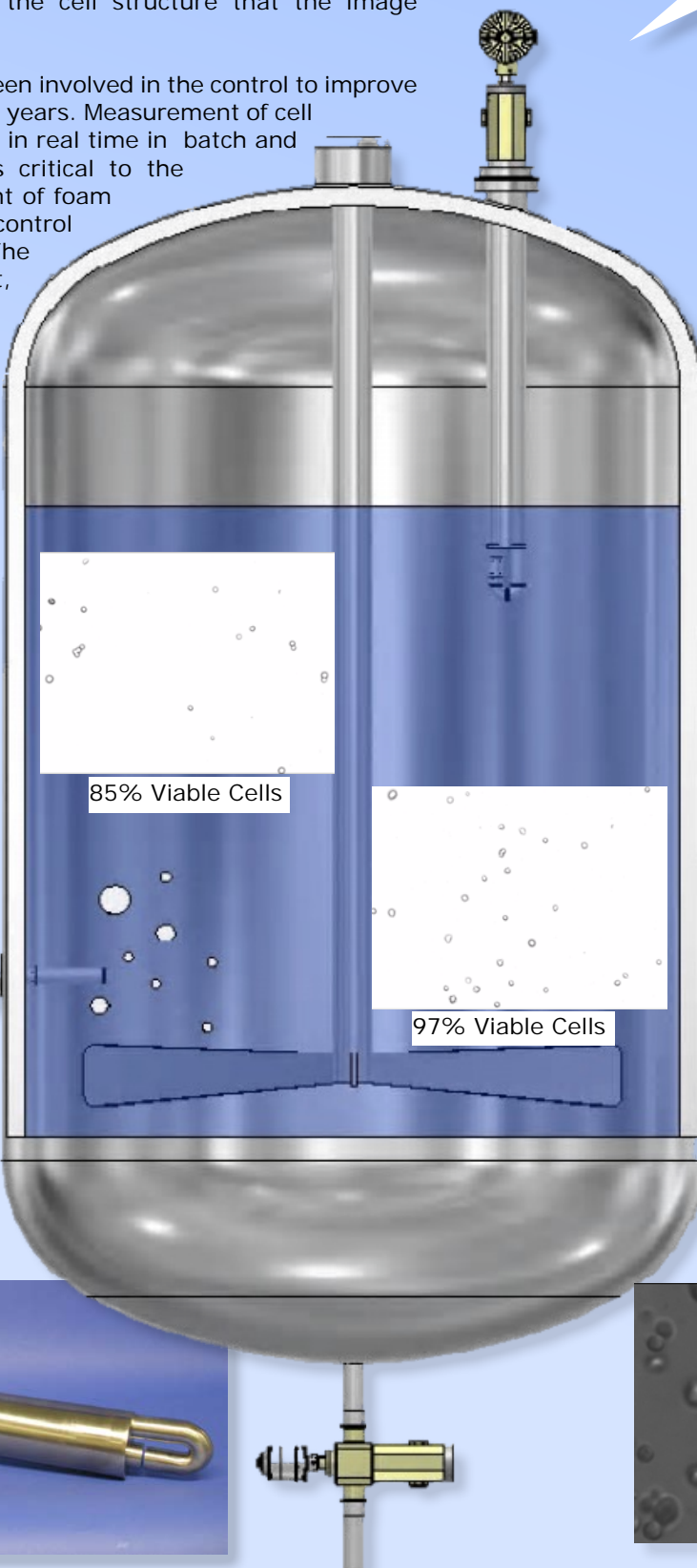
CANTY dynamic image processing performs several valuable functions in fermentation. The system captures images for cells down to .7 micron (.3 micron with phase contrast) and identifies the cell size distribution and culture count for process control. In many cells the cell viability is determined since a count of the ratio of live to dead cells is calculated by way of the cell structure that the image calculates.

CANTY imaging systems have been involved in the control to improve yield of fermentation for several years. Measurement of cell size, concentration and viability in real time in batch and perfusion type fermentation is critical to the process yield. The measurement of foam allows operators independent control of antifoam additions. The measurement of cell size, count, viability and concentration in the lab or at-line is accomplished by our imaging based system which can distinguish a cell from a gas bubbles and other trace particles.



## CRYSTALSCOPE™

.7 um – 680 um Particle size analysis range in a reactor for monitoring crystal size in real time from nucleation to full growth. 2D results with no need for multiple probes.

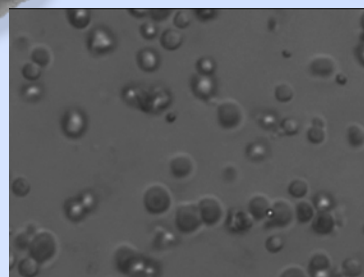


PARTICLE SIZE,  
SHAPE & DISTRIBUTION  
WITH REAL TIME  
ANALYSIS



## GLASS REACTOR MICROSCOPE

The Glass Reactor Microscope - GRM allows for full visualization of smaller lab scale crystallization processes. It features a unique optical flat section for representative image capture. The reactor itself is jacketed reactor to allow for controlled heating & cooling, while the lid includes several spare ports for additional instrumentation that may be used during any tests or experiments.



Mammalian Cells

For More Information Click [Here](#)



# CELL ANALYSIS

## Cell Count & Viability

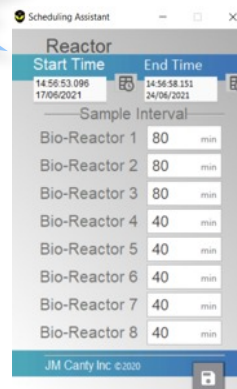
CANTY's vision based technique works on the basic principle of presenting the product between a high intensity LED light source, and a microscopic camera. The captured images are then sent to CantyVision™ cell detection software for analysis, where they are measured under a number of different size & shape parameters:

- Cell Diameter and Radius
- Area and Volume
- Nucleus
- Circularity
- Intensity

**NO DYE  
NEEDED**

The software can then output user defined particle size distribution and particle concentration information as well as cell viability percentages. Features include:

- Gigabit Ethernet technology for optimum image retrieval
- Analyze suspended cells down to .7 micron
- Auto dilution with peristaltic pump or syringe pump done through the software
- Software analysis up to 15 FPS
- 2.5 minutes to run an 8mL sample
- Auto cleaning / flushing cycle with cleanliness determination



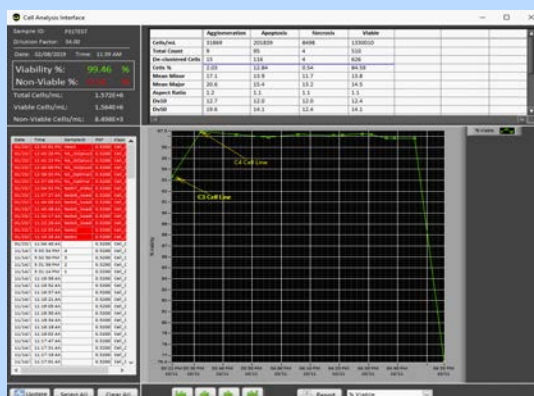
CANTY offers an auto-sampling system as well as the ability to tie into customer's current auto-sampling system



Viable Cells



Necrotic Cells



### Cell Concentration Determination

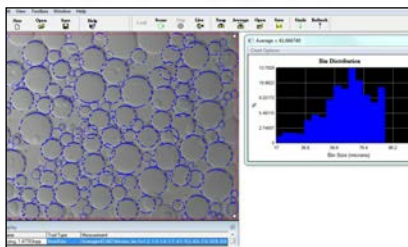
The CANTY Cell Analysis Software along with a syringe pump and peristaltic pump automatically dilutes concentrated cells to the appropriate optimal imaging density. The software then calculates a dilution ratio based on the amount of the cells to the amount of dilution buffer. The dilution process is performed automatically at a rate of up to 15 frames per second.

With auto dilution of samples it was found that no saturation point was reached for the cell densities tested up to  $30 \times 10^6$  cells per milliliter.

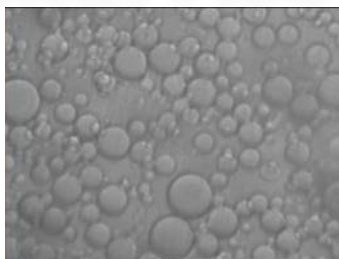
For More Information Click [Here](#)

# INLINE LIQUID ANALYSIS

## CHROMATOGRAPHY - BUBBLES & BEAD SIZE



For More Information Click [Here](#)



Chromatography Beads

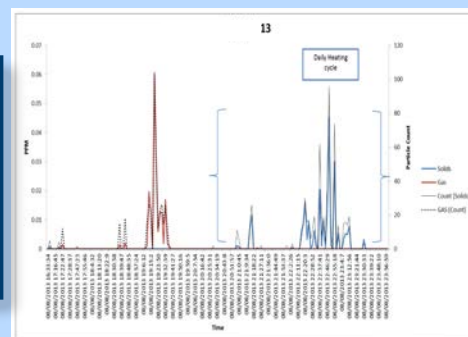
A vessel mount system can be used for real time image capture during the production of polymer beads. The captured images are analyzed by CantyVision™ software, to provide a complete bead size distribution through the complete process, allowing for greater control over final product size. Applications include pentane injection and end bead size. Also see Solid Particle Sizing for dry bead sizing.

## WATER FOR INJECTION (WFI)

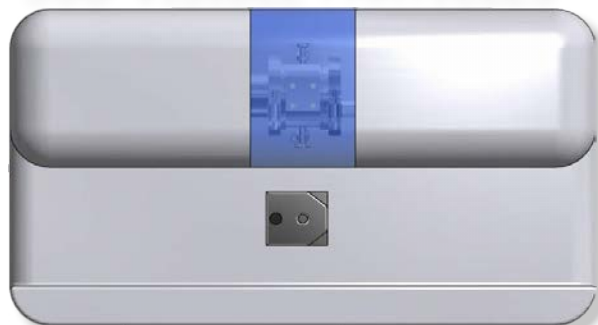
The PharmaFlow™ is designed to be installed in-line to monitor WFI so the manufacture can have longer run times and can verify constant compliance with the USP. CANTY can output the particle concentration continuously so that if an upset does occur the operators are aware of it and take samples to the lab for further testing. What's more, CANTY's unique vision based system allows for differentiation between particles and gas bubbles. Visual verification is provided and 4-20mA signals or OPC can be used to alarm to an upset condition.



For More Information Click [Here](#)



## SUB-VISIBLE PARTICLES



Particle Size Analyzer

The FDA has put a recent focus on measuring and quantifying SVP to look for particles in product and process streams. The CANTY system is an invaluable tool in the lab and in-line. The LED light source with the Ethernet gigabit camera and the imaging-based software can analyze both size and shape as well as count and concentration of particles. Both continuous and lab options are available.

For More Information Click [Here](#)

## CRYSTALSCOPE™



For More Information Click [Here](#)

- Particle Size, Shape and Distribution with Real Time Analysis
- Fused Glass Pressure Barrier Standard
- CCD/CMOS Based High-Speed Imaging Device

.7  $\mu\text{m}$  – 680  $\mu\text{m}$  Particle size analysis range in a reactor for monitoring crystal size in real time from nucleation to full growth. 2D results with no need for multiple probes. The CANTY CrystalScope™ is a vision based system for monitoring crystal size in real time from nucleation to full growth. This inline microscope includes a high speed camera with adjustable shutter speed, combining a lens configuration that offers dynamic Ethernet controlled calibration for magnification and focus settings.



# TURBIDITY

## TURBIDITY / CIP

### CIP

- Monitor for TOC and Particle Level
- Reduce Lab Time
- Monitor for TSS

### Turbidity

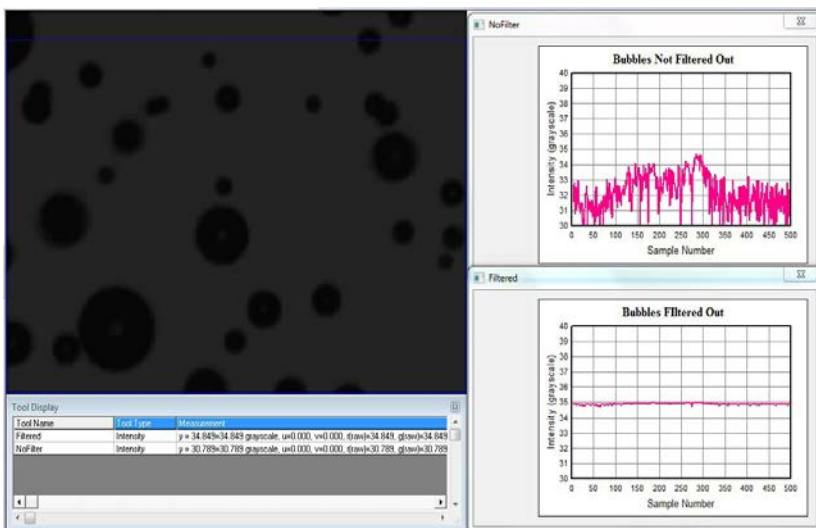
Turbidity analysis using a high resolution CCD/CMOS image sensor that detects turbidity changes in fluids by measuring the transmittance of light. Using advanced software algorithms the system automatically removes gas bubbles from the analysis resulting in highly accurate and repeatable data outputs. This system is designed for inline use with varying pressures, temperatures, and pipe diameters.



### Features

- Ethernet Connectivity
- Real Time Monitoring Of Process In Flow
- Solid One Piece Central Hub
- Supplied With Internal O-ring Seals
- Easily Installed Modular Unit
- Fused Glass Process Barriers
- Regulated Light Source Emits Cold Light To Prevent Product Bake-On
- OPC, 4-20mA Current Loop, EXCEL spreadsheet and Relay Outputs Are Available
- Single-use options Are Available
- Visual Verification
- In-line Analysis

## EFFECT OF GAS BUBBLES

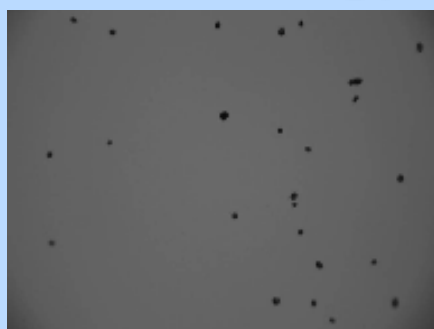


## Turbidity (NTU)

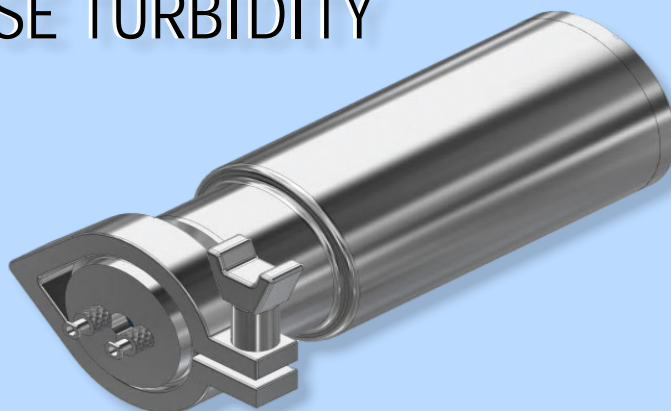


For More Information Click [Here](#)

## SINGLE-USE TURBIDITY



Visual Display to verify product



# SINGLE USE



## S.U. BIOCAM™ - VESSEL LEVEL

The single use vessel level system from CANTY allows operators to track the level inside a single use container by way of a camera. The allows for non-contact of the product and visual verification of the level. CantyVision™ software can output via 4-20mA or OPC to a PLC or DCS for complete control. The system utilizes the CANTY LED light with fiber optic bundle so the any size bag or container can be accommodated using the same system. The LED light is a cold white light with no heat transfer to the process so zero effect on the process conditions. Multiple control points can be set to alarm at various stages in the process.



The CANTY S.U.BioCam™ is uniquely qualified to view inside your fermenters and bioreactors and provides a continual control signal allowing the user to meter in antifoam. The S.U.BioCam™ is an Ethernet based imaging system which connects to the CANTY VCM™ image processor that determines the percentage of foam on the surface of the liquid. The foam control function allows for significant savings of antifoam, improves process performance in cell culture growth and eliminates the need for additional antifoam fluids in purification.

### FEATURES:

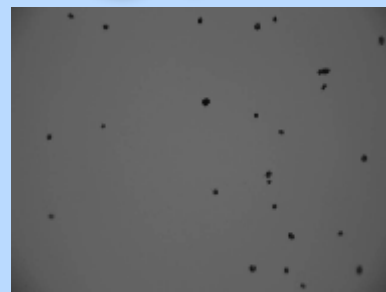
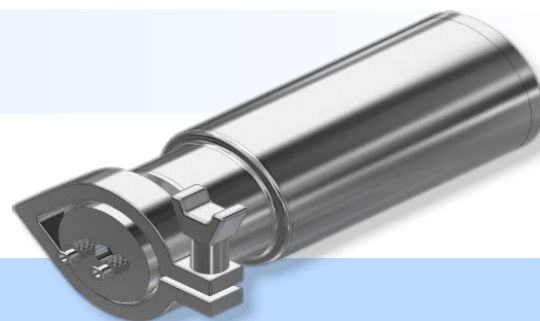
- Automatic control of anti-foam
- LED light source - maintenance free
- Prevents lost batches
- Limit over dispense of foam
- Less foam equals less downstream purification
- Reusable camera attaches to disposable fitting
- Internal heaters prevent condensation on disposable fitting
- Strobed light allows for optimized illumination without interfering with photosensitive processes
- System outputs via OPC or 4-20mA to a DCS or PLC for complete, closed-loop control



For More Information Click [Here](#)

## SINGLE USE - PARTICLE SIZE ANALYSIS

The CANTY SINGLEFLOW™ has been engineered to analyze small volume samples for particle size, shape and concentration in single use systems. The SINGLEFLOW™ easily converts from a lab unit to allow for continuous sampling in-line using sanitary Tri-Clamp™ connections. It offers microscopic, non-destructive viewing and provides particle size analysis with two dimensional results when used in conjunction with the CantyVisionClient™ Software. The vision system, with integral lighting, features precision optics designed to enhance the image prior to display or analysis. The image sensor is a high resolution / high speed CCD camera coupled to a microscopic lens system. The system offers zoom and focus ability, variable lighting, and disposable lens packages. The SINGLEFLOW™ features single use windows as the flush product contact barrier which ensures laminar flow & eliminates pockets for potential product build-up. Sizing down to 0.7 micron is possible with the high magnification optics and high intensity light source. A variety of pharmaceutical process need to be monitored and analyzed real time. This allows engineers and operators to view inside the process and give real-time results with visual verification.



Visual Display to verify product



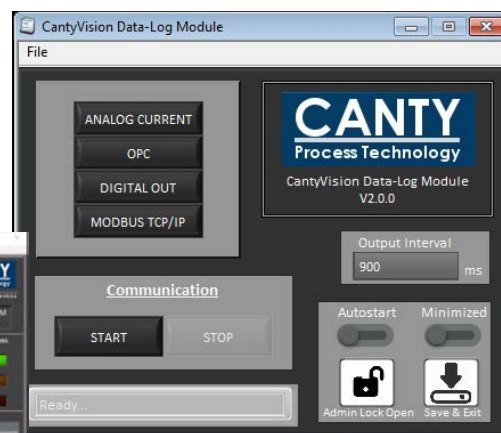
# Vector Control Module



The Vector Control Module (VCM) is a small fanless solid state embedded processor that has CANTYVISION™ software pre-installed. It is designed to keep project costs low and to also eliminate the need for a computer. Since the VCM has analog outputs, there is no need for an additional analog output module purchase\*. The operator screen makes it simple for operators to see what is going on real time with visual verification.

The VCM has OPC or 4-20mA outputs to a PLC or DCS for complete control. The VCM comes with the ability to have full administration controlled passwords and permissions. This compact design and cost effective system is easily setup and has a customizable screen. Access to technical support can be obtained with Internet connection.

- Supports up to six cameras
- OPC outputs
- Up to eight analog 4-20mA outputs
- Link to technical support (when Internet connected)
- Digital IO
- Four USB Ports
- Four serial ports
- CautyVision™ Software installed
- Full administrative control embedded operating system
- Fan-less solid state vision control system



For More Information Click [Here](#)

## ADDITIONAL PHARMACEUTICAL PRODUCTS

### QUICKPORT™

- No Bolting or Torquing required
- Full Vacuum
- ANSI 150 lb. and 300 lb. Mount

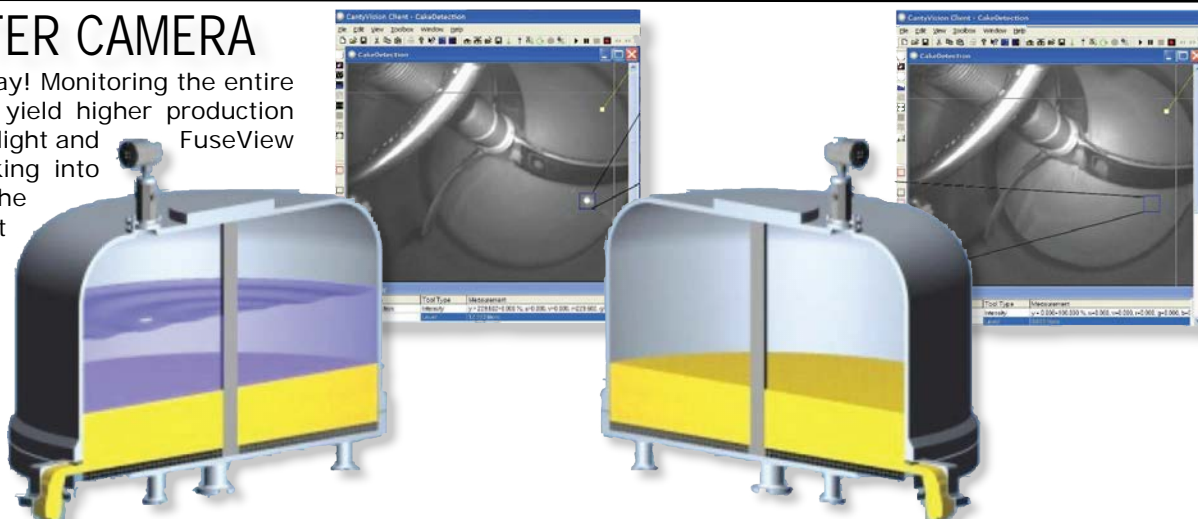
The Cauty QuickPort™ is a patented, safe, quick opening closure for process vessels. Originally used in the offshore diving industry as a transfer lock on decompression chambers. QuickPorts™ are used with no additional interlock by various non-industrial personnel in applications where any operational failure would be fatal.

For More Information Click [Here](#)



### NUTSCHE FILTER CAMERA

Stop washing product away! Monitoring the entire filter drying process will yield higher production results. Using the CANTY light and FuseView will assist operators looking into the dryer by using the brightest net light output and the largest view in the industry. The CANTY camera and light combo can be used to control and monitor level control and cake detection. By using the CANTY system it will eliminate over drying of the cake.



**CANTY'S GOAL IS TO PROVIDE EQUIPMENT TO ENHANCE PROCESS CONTROL  
AND YIELD. WE ACCOMPLISH THIS BY DESIGNING, MANUFACTURING, AND  
SERVICING THE FINEST EQUIPMENT IN THE WORLD.**

Some of Our Valued Customers:

ABBOTT LABORATORIES  
ABBVIE  
ALEXION PHARMACEUTICALS  
ALLERGAN  
AMGEN  
ASTRAZENECA  
BAXTER INTERNATIONAL  
BAYER  
BIOGEN  
BRISTOL-MYERS SQUIBB  
CELGENE  
COVIDIEN  
ELI LILLY & CO.  
GILEAD SCIENCES

GLAXOSMITHKLINE  
HUMAN GENOME  
JOHNSON & JOHNSON  
MALLINCKRODT  
MEDIMMUNE  
MERCK & CO.  
NOVARTIS  
NOVO NORDISK  
PFIZER  
REGENERON PHARMACEUTICALS  
ROCHE  
SANOFI  
SHIRE PHARMACEUTICALS  
TEVA PHARMACEUTICALS

AND YOU!!!



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