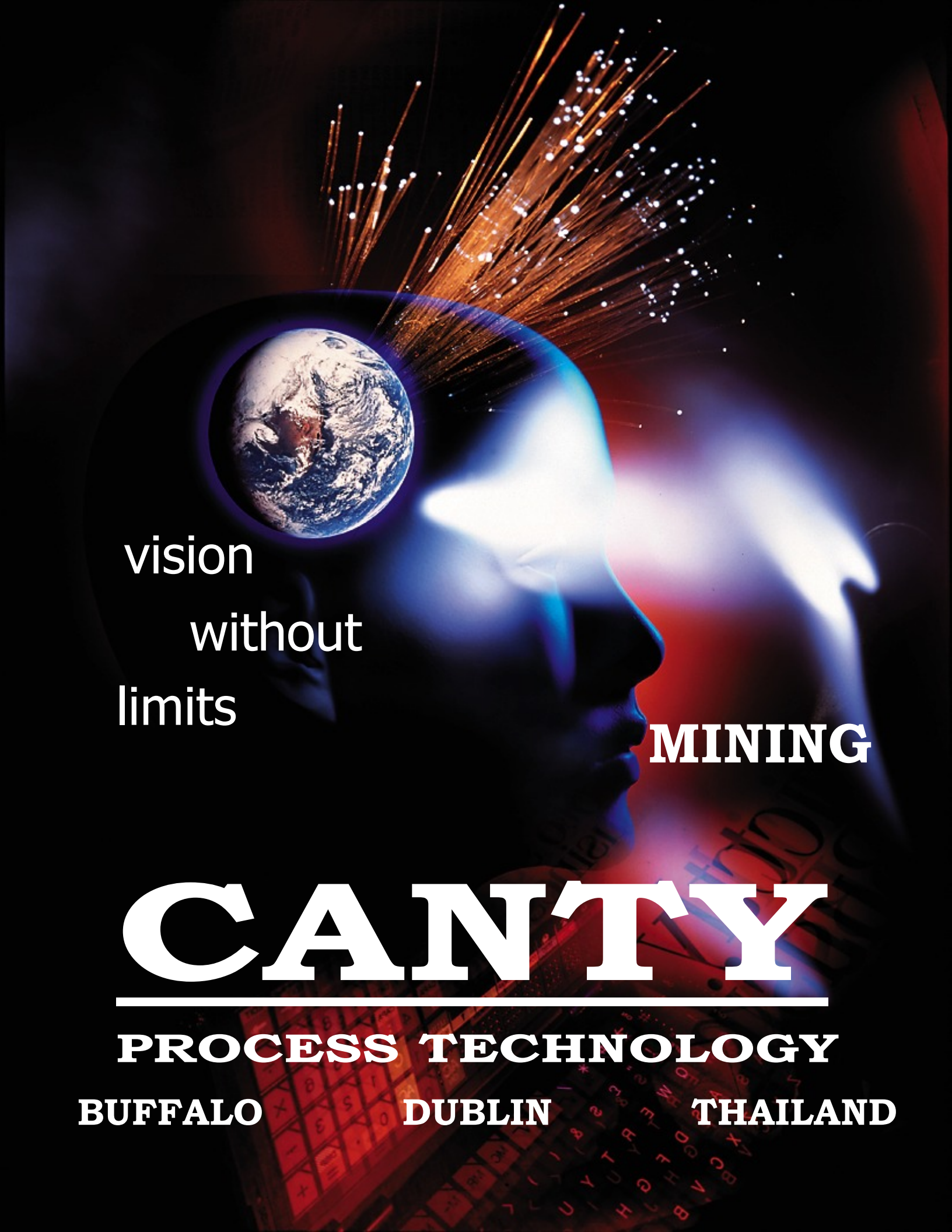
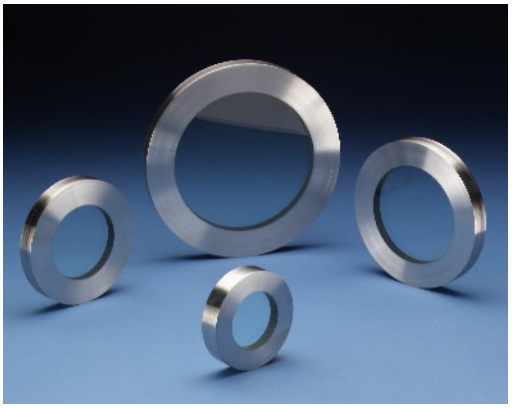

vision
without
limits
MINING
CANTY
PROCESS TECHNOLOGY
BUFFALO
DUBLIN
THAILAND

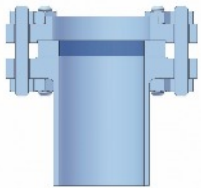
CANTY FuseView™



Our unique fused glass windows far exceed all conventional tempered glass windows in safety and performance. CANTY windows can be easily removed for cleaning and do not have to be discarded in the same way as traditional tempered glass windows.

How It Works

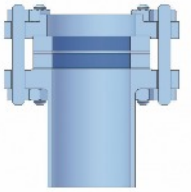
To manufacture a FuseView™ we heat the glass to it's molten point where it flows to the wall of the metal. At that point the glass fuses or bonds to the metal. Then we slowly cool the FuseView™ until the glass solidifies. The metal has a higher coefficient of expansion than the glass and the metal compresses 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.



FUSEVIEW™ ANSI/DIN

- Ideal for new or retrofit applications.
- Available in ANSI/DIN as well as almost any custom size.
- The largest viewing area of any fused sight glass on the market.

• Quartz/sapphire shield for caustic service is available as an option



FUSEVIEW™ HIGH TEMP

- Include dual FuseView™ sight glasses for extreme high temperature applications.
- Dual sight glass package insulates the inner FuseView™ sight glass against thermal shock.

For More Information Click **Here**

Sight Flows

All CANTY sight flows come standard with FuseView™ sight glasses to provide the safest sight flow in the industry. Our sight flows have been designed to meet strict ASME code requirements and all units are hydro-tested to 150% of the maximum rated pressure.

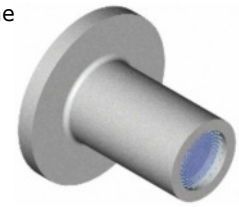
MODELS

- Flanged
- Threaded
- Welded

FUSED GLASS ADVANTAGE

All CANTY sight flows feature FuseView™ sight glasses to ensure safety. By fusing glass to metal, a high pressure, high safety and high impact hermetic seal is formed.

A **Jet Spray Ring** can be used in combination with any low viscosity fluid that is compatible with the process, to generate a high energy vortex action on the surface of the sight glass to remove any fouling, and ensure a clear view at all time



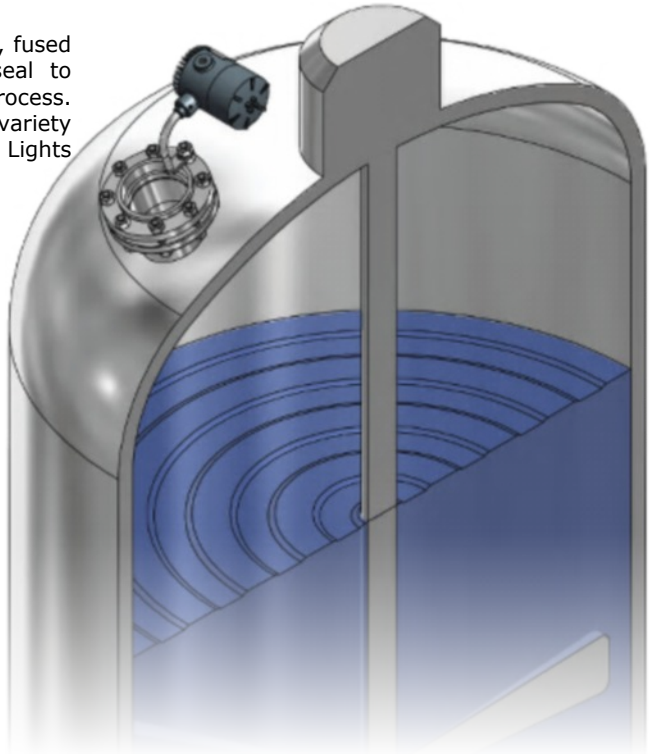
CANTY Lights

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.

Bundles mount direct to FuseView™ - No light loss due to reflection!

CANTY 12" bundle models mount directly to a sight glass with an optional bracket.

- View and illuminate through one nozzle
- Maximum LED illumination
- Cool light output - there is no product bake-on



Flexible fiber optics allow for Mounting in any convenient location!

CANTY 24" and longer bundle models mount remote from the sight glass with an optional bracket for increased Accessibility.

- High Intensity LED Lighting
- NEMA 4, IP66, Explosion proof, Flame proof models
- Fused glass seal provides a safe, reliable, hermetic seal between electronics and the process area.

Consult factory to easily upgrade your existing halogen lights to LED!

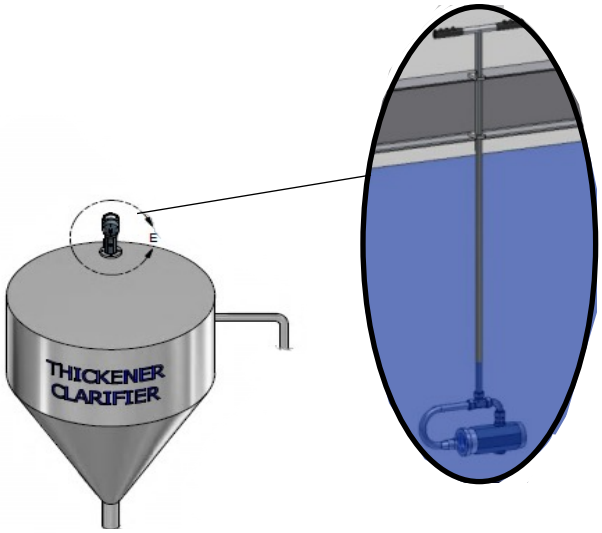
For More Information Click **Here**

Thickener/Clarifier

The CANTY Difference

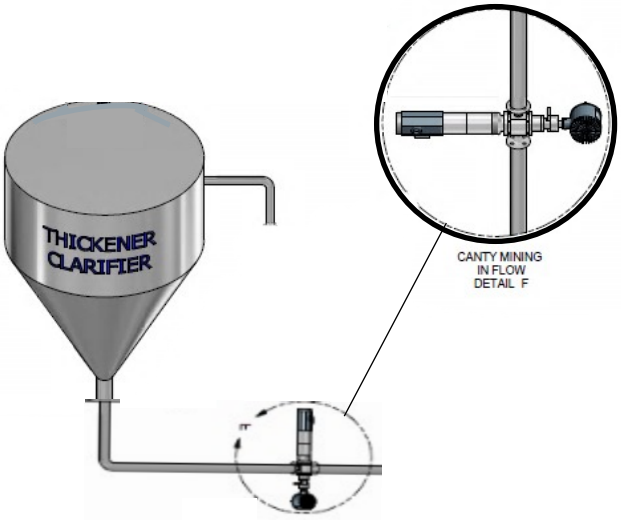
- No need for sample tubing which eliminates problems with frozen tubing
- System is analyzing particulate from the main turbulent stream which eliminates potential for harmful build-up to cause inaccuracies in Particle Size Analysis (PSA)
- Cuts down on Polymer use; real-time PSA can give helpful feedback on if too much or too little polymer is being used in tank which can reduce production cost and time

Applications



1. Monitoring percent solids in water/clarified solution:

This helps ensure no product is being lost in waste as well as making sure clarified solution is meeting the necessary environmental standards. We do this by placing a Canty Immersion Turbidity/ Color Analysis/ Percent Solids Analyzer into the head of clarified solution as shown in the diagram to the right.



2. Flocculate PSA:

We can monitor the size of the aggregate in the thickened solution to ensure uniformity in particle size as well as if the proper amount of polymer is being used. We can do this by placing a Canty INFLOW analyzer inline with the stream of flocculate leaving the tank as shown in the diagram to the right.

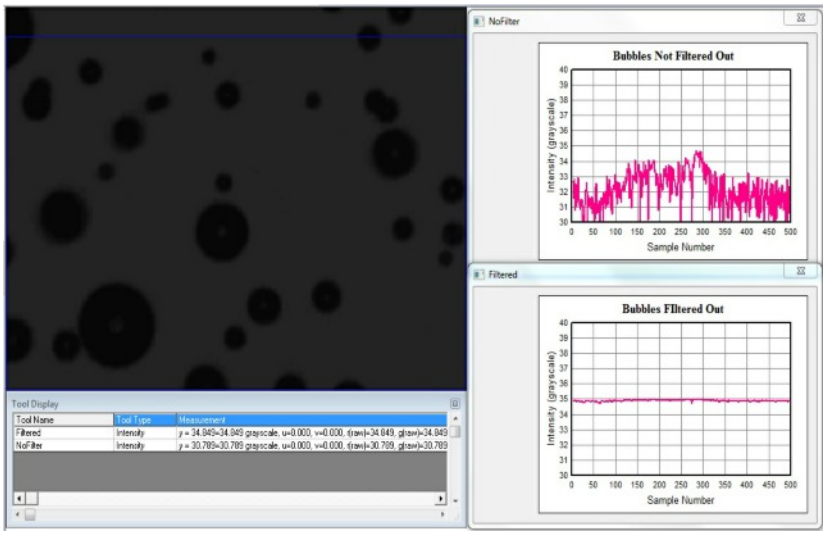
Turbidity

Turbidity • Leeching •

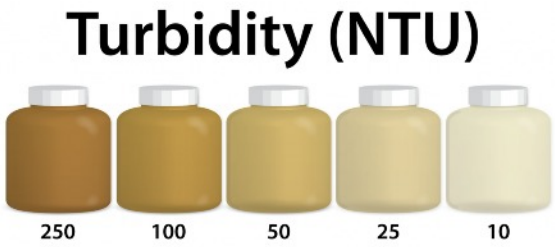
- Monitor for TOC and Particle Level
- Reduce Lab Time
- Monitor for TSS

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.

Effect of Gas Bubbles



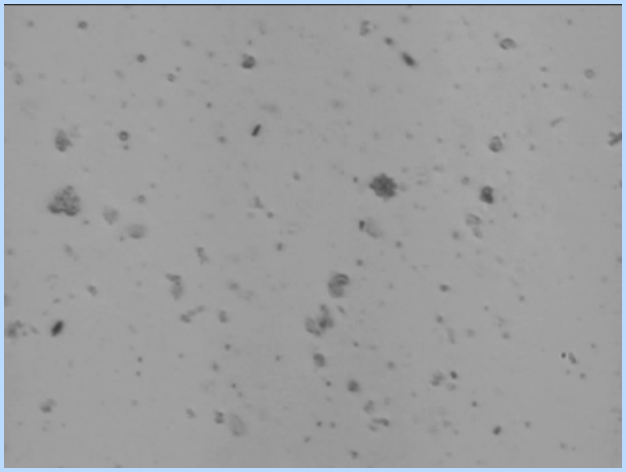
Features
- Ethernet Connectivity
- Real Time Monitoring Of Process In Flow
- Solid One Piece Central Hub
- Supplied With Internal O-ring Seals
- Easily Installed Modular Unit
- Fused Glass Process Barriers
- Regulated Light Source Emits Cold Light To Prevent Product Bake-On
- OPC, 4-20mA Current Loop,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



Slurry PSA Applications

Tailings Measurement

For monitoring of tailings outputted from the flotation tank, CANTY's at-line real time liquid particle image analysis systems provide true size, shape and concentration output providing the operators with the key characteristics of the tailings for optimum operational performance and disposal.. The Inflow is able to correlate to a sieve and output in the same format so the analysis remains the same but the data is real-time. This eliminates the need for sampling.

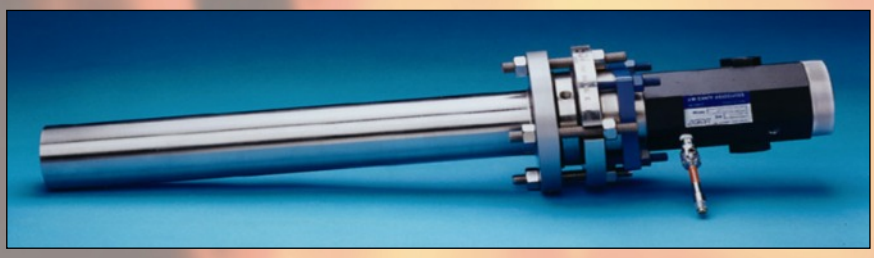


CANTY

High Temperature Cameras

CANTY High Temperature Cameras are ideal for demanding applications involving visual inspection or verification in extreme temperature environments. CANTY High Temperature Camera Systems feature a fused glass seal standard equipment with every model. This unique seal provides an impenetrable safety barrier to protect the camera electronics from the harsh process environment and preventing hazardous vapors from escaping into your plant. All Ethernet camera systems come with CantyVision™ software for analysis of the process and allows for measurement of temperature, flame size, level, etc.

UltraTemp™ Insertion High Temperature Cameras

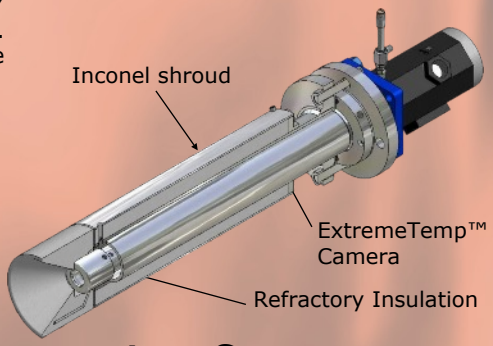


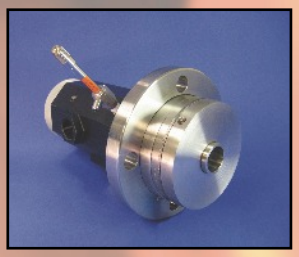
- No cooling air required. Air is used for cleaning only
- 2000ºF [1090ºC] or 2500ºF [1370ºC] models
- High temperature furnace package
- 12”-36” models available to insert thru refractory wall
- High quality quartz optics
- Disposable, protective quartz shield
- Auto electronic iris
- Non-blooming CCD camera

ExtremeTemp™ Kiln Furnace Cameras

Designed for the extreme 3000ºF [1650ºC] max. temperature requirements of glass furnaces, the ExtremeTemp™ Furnace Camera combines the a CANTY UltraTemp™ Camera with an Inconel sleeved high temperature refractory jacket. The assembly is inserted thru an opening in the fire brick, providing a remote view into the furnace.

- 3000ºF [1650ºC] max. rating - extreme temp furnace lens
- High quality quartz optics
- Auto electronic iris
- Disposable, protective quartz shield
- Non-blooming CCD or Ethernet cameras
- Cooling air required



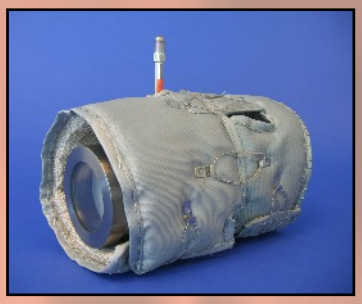


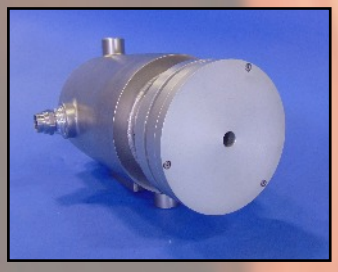
UltraTemp™ Flush Mount High Temperature Cameras

- Ideal for applications where combined refractory and nozzle length are <4” [102mm]
- 2000ºF [1090ºC] process temperature / 1300ºF [700ºC] at lens
- 3” 150# ANSI or 80 mm 16 bar DIN flange mounting options
- Includes protective quartz shield and spray ring assembly

HighTemp™ Surveillance Cameras

- Optional mounting stands available
- High accuracy
- Remotely mounted - direct line of sight
- Ambient temperatures to 200º F.
- Ethernet connectivity
- Includes HT insulation, glare filters
- Optional mounting stands available





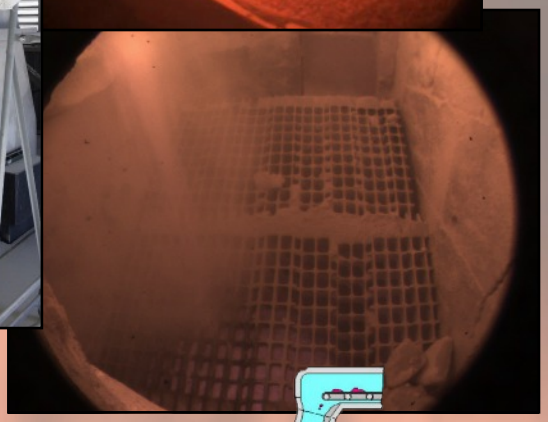
Water Cooled Camera Jacket

- Ideal for applications where instrument air is unavailable
- Effectively cools camera housing and acts as an insulatory barrier against ambient heat
- Highly efficient and minimizes cooling costs

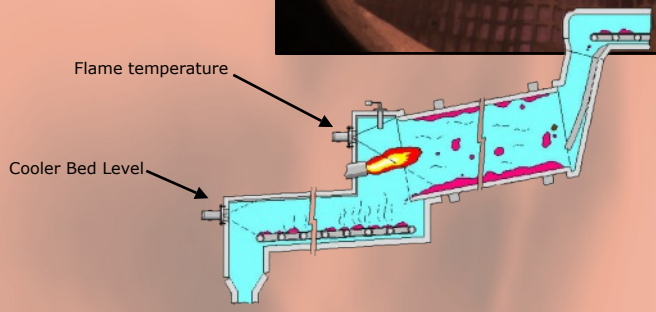
High Temperature Applications

Rotary Kilns

- Cement
- Lime
- Metakaolin
- Titanium Dioxide
- Alumina
- Vermiculite
- Iron Ore Pellets



A key feature that must be maintained is the fire in which they are using to cause the calcination of the material. This can be achieved by monitoring the fire by its temperature. Another key item to monitor on the fire is its size and shape to make sure the kiln is having uniform heating. CANTYVISION can be used to monitor the temperature of the flame and also give visual verification of size. The rotation of the kiln plays a key role in making sure the product is distributed correctly and that the product is not creeping up the side walls too high or too low as that will affect the rate at which the product is heating up and ultimately affect the calcination process. CANTYVISION can be used to give visual verification of product. This will be a critical feature for the operator. Operators also have to keep an eye on the grates, if they have clunkers build up it can damage the grates and eventually wear them down. Once they wear down they have to be replaced. The grates themselves are very expensive plus the kiln has to be shutdown. The CANTY HT Camera will alarm via OPC or 4-20 mA to a PLC or DCS for complete control and allow operators to only have to open the system when clunkers are present.

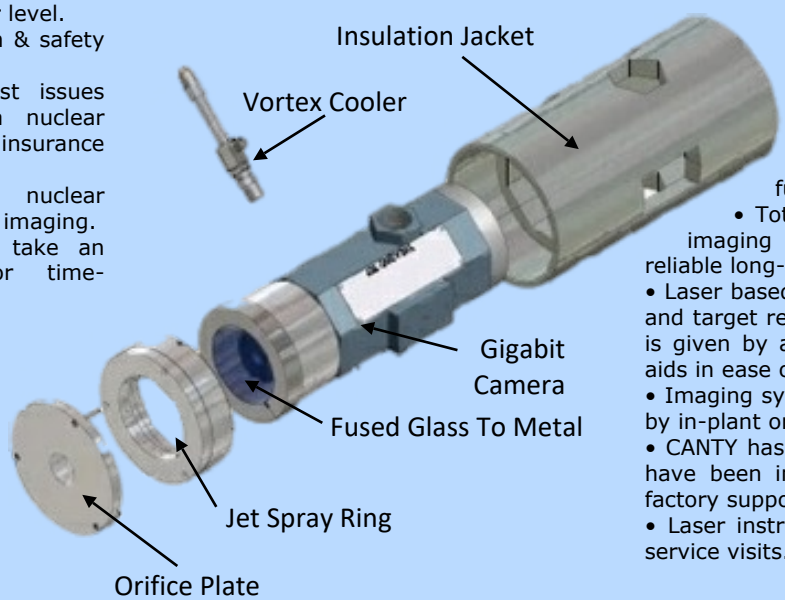


Flame Temperature • Bed Level • Bed Temperature • Wall Temperature • Grate Monitoring

Smelter Molten Level

Imaging vs Nuclear Level Measurement

- Imaging is an order of magnitude accuracy better than nuclear level.
- Imaging avoids the health & safety issues of nuclear.
- Imaging avoids the cost issues associated with having a nuclear source at site (perception, insurance costs, source disposal costs)
- An on-site dedicated nuclear specialist is not needed with imaging.
- With imaging you can take an instantaneous reading or time-averaged reading.



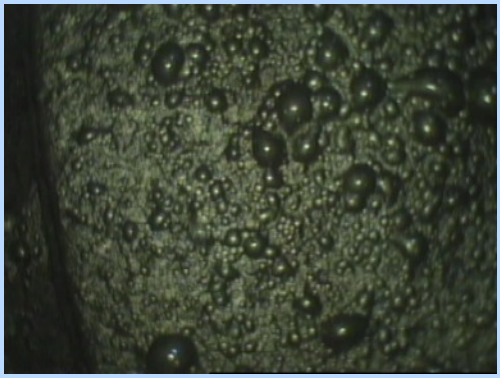
Imaging vs Laser Level Measurement

- Imaging is a direct measurement with a one time zero drift calibration
- Laser based systems can be difficult to install / align / calibrate, and require regular re-calibration to function correctly.
- Total cost of ownership is reduced with imaging due to reduced maintenance and reliable long-term readings.
- Laser based instruments have a single generator and target receiver without any visual display that is given by an imaging system. A visual display aids in ease of calibration.
- Imaging systems are easy to support in the field by in-plant or local technicians.
- CANTY has hundreds of purchased systems that have been installed by plant personnel with full factory support.
- Laser instruments typically require factory field service visits.

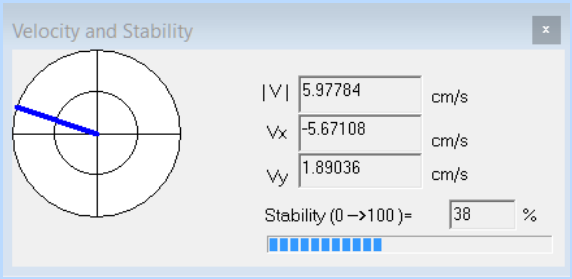
Smelter Furnace Smoke Detection System

CANTY Opacity System for smelter furnace smoke detection uses a gigabit Ethernet camera with a back-mounted light source to detect the presence of smoke. The system includes jet spray rings to keep the system free of particulate and is easily mounted in systems of all sizes as well as retrofit applications. The camera continuously images the stack to look for any presence or increase in smoke and alarm thresholds can be set to send a digital signal or 4-20mA.

Flotation

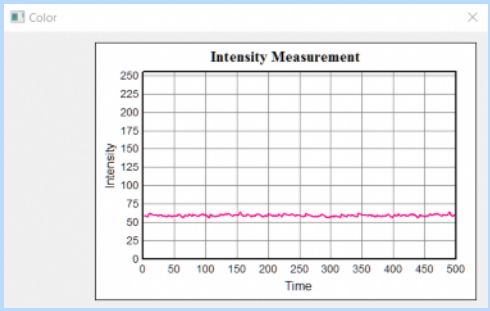


Within the flotation tank, monitoring of the froth characteristics at the surface is highly critical in order optimize yield of the mineral. CANTY provides a modular camera light combination unit to provide a remote continuous view and control by detection of froth bubble size, velocity and stability.



BUBBLE:
- Velocity
- Direction
- Size Distribution
- Stability

LEVEL:
- Liquid Level
- Froth/Bubble Level



SPRAY RING FOR CLEANING

The system uses a fused glass front cap which provides a hermetic glass to metal seal that is shatter proof and high impact. The glass is fused at 2000ºF and then cooled which enables the metal ring to fuse and compress on the glass providing a reliable flush surface. The spray ring jets onto the fused glass flush surface cleaning the viewing surface to allow accurate continual reads. Water pressure of 40 - 80 PSI is typically used.

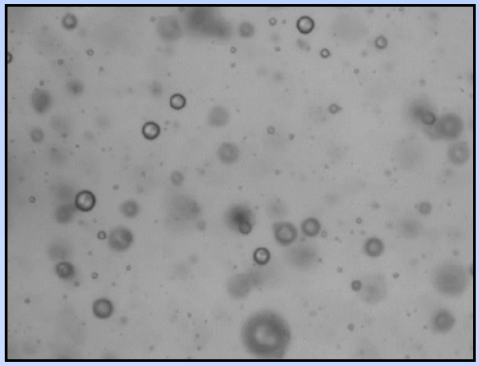
Chute Plug

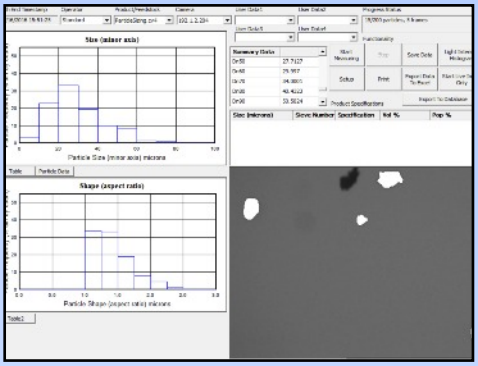
Chute Plugging especially before the ball mill becomes a problem and can only be controlled by a camera to stop major upsets. Probes only stop the feed when it is too late and requires a ton of manual maintenance for eliminating the plug or the spill over. With a camera system and analysis the chute can be controlled and the process can be adjusted to help eliminate the need for manual labor being required for clean up or downtime due to plugging!

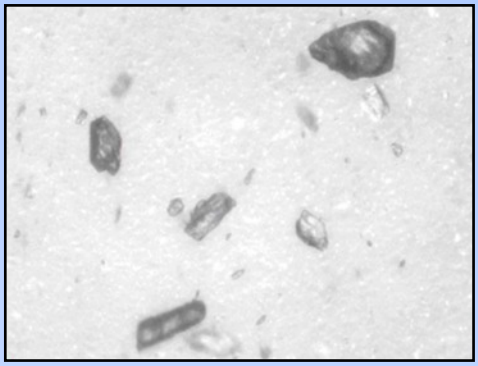
Slurry Particle Sizing

The liquid slurry to be analysed passes through the analyzer flow cell, which incorporates a microscopic camera, and high intensity back lighting system. High resolution 2D images are captured and sent to CantyVision™ software for realtime analysis. Each particle is measured under a range of size and shape parameters including major axis, minor axis, area, perimeter, aspect ratio circularity and equivalent circular diameter, to provide a truly comprehensive particle characterisation. The imaging principle allows for visual verification of any results, and aids the user in developing a greater understanding of their process or product.

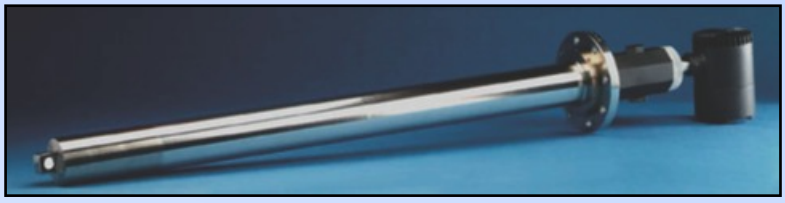
Particle Size from 0.7µm to no upper limit* • Particle Shape • Particle Concentration

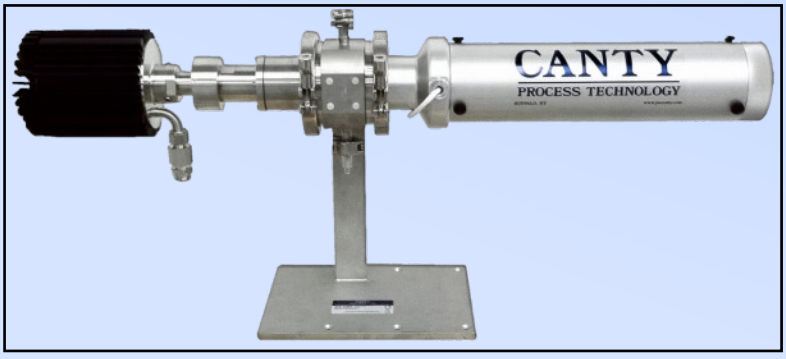






Various options are available for pipeline (in-line or at-line), vessel and off-line (lab) measurement, all of which include fused glass technology allowing for use on **HIGH PRESSURE & HIGH TEMPERATURE** applications.



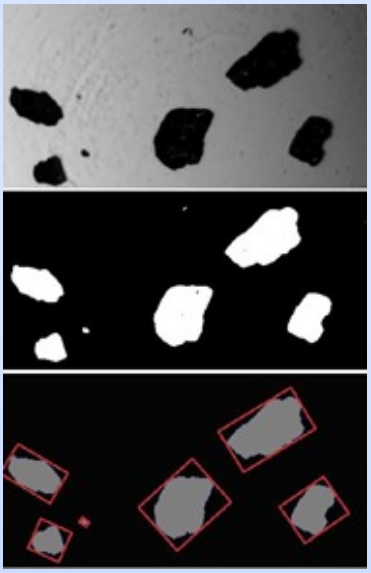


Automatic Dilution

The CANTY Automatic Dilution System uses a 0- 1/2” variable insertion measurement gap. This insertion is made possible by the Fuseview™ sight glass, which allows the optical fused pieces to be located in the center of the fluid stream, which is unique to the CANTY system. The fused glass seal contains no gaskets, ledges, or steps allowing the highest velocity, representative sample and keeps the sensor clean, even in the harshest of environments. The fused glass seal location keeps the sensor in line with the process temperature to avoid product build up due to thermal change. The image processor can be configured with multiple zone sensing on the image of the fluid. The results from the zones can be compared to base line values for reliability and alarm on detection of a problem.

*Consult factory for system range

Lab Solid Particle Sizing



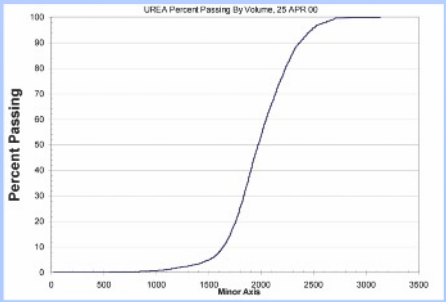
Size and shape analysis of dry particles or pellets, is performed by the range of Canty Solid Sizer equipment. The product to be analysed is fed into the system hopper, where the built in material handling system separates the particles into one even layer, and transports them into the analyser's measurement zone.

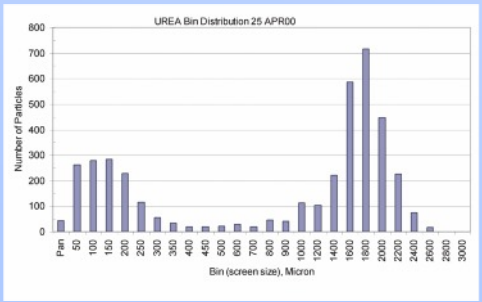
Within the measurement zone, the particles pass between a high intensity LED light source and camera, which captures high resolution images 2D images.

These images are then binarized, and by analysing the number and position of the image pixels, a full particle **SIZE** and **SHAPE** distribution.

Meets ASTM Standards • Stone • Minerals • Frac Sand
Particle Size from 10µm to no upper limit*

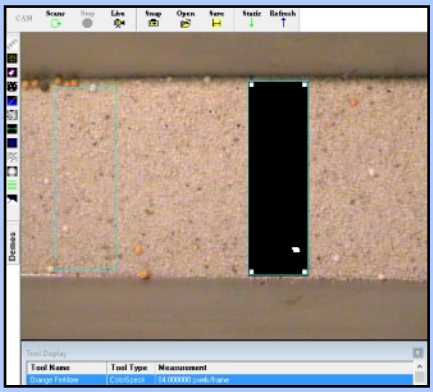
Lab or Industrial (At-Line) Systems

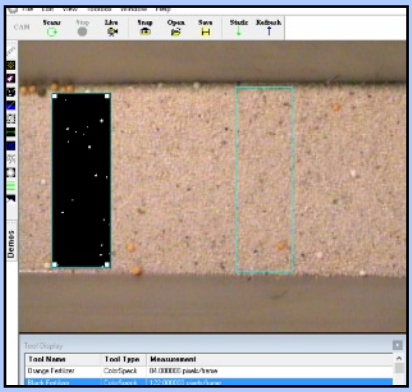




BLACK SPECK or **COLOR SPECK** detection is available as an add on to a particle size and shape analyser, or as a stand alone system. This uses a camera system with controlled front lighting system for accurate color representation within the captured images. Multiple measurement zones can be configured to allow for detection of particles of different colors within the same product.

Contaminant Detection - Mixture Ratio Analysis





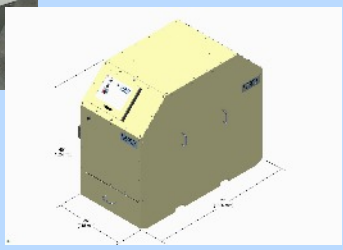
Color Particles Detected **Black Particles Detected**

*Consult factory for system range

Solid PSA Applications

RockSizer™

50 um – 6,000 um Particle size analysis range. This system is designed for lab & on-line use to determine particle size, shape and distribution, thereby eliminating the need for sieve analysis.

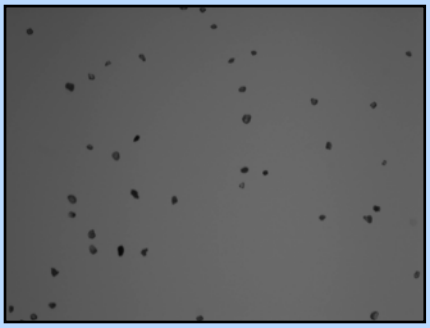


Sand

The CANTY SolidSizer™ is a vision-based sensor used with the CANTY VCM (Vector Control Module) image processor for dry sand size measurement in a laboratory environment or inline. The CantyVision™ Software accurately measures multiple aspects of the sand from area / perimeter / minor and major axis / etc. In comparison to a sieve which measures only minor axis the CantyVision™ software can correlate directly to a sieve so the customer does not have to change any QC documents. The SolidSizer™ can correlate within 1% of a sieve with 99% repeatability. A typical sieve analysis takes anywhere from 20-30 minutes including cleaning and setup for a 70-100 gram sample. On the SolidSizer™ that same sample takes less than 2 minutes. Also multiple screen distributions can be setup to accommodate multiple customers or areas in the process, hence eliminating the need for multiple runs on the same sand for different size distributions. After correlating to current methods of minor axis, customers find benefit in comparing minor axis to major axis and making sure the sand is round instead of needle shaped for objective shape measurement. The inflow is available so to make the same exact measurement without having to dry the sand!

Crusher

In order to monitor crusher performance, CANTY provides Industrial SolidSizer or 3D Rocksizer image analysis systems, which determine if the mining aggregates outputted from the crusher are the correct size and shape. The systems can be run at line through the use of a sweep sampler, or offline as laboratory instruments.

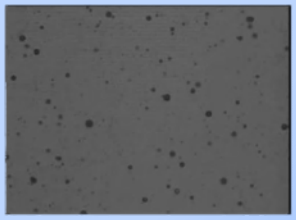
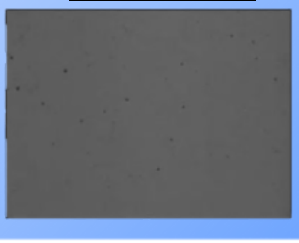


Sieve Replacement

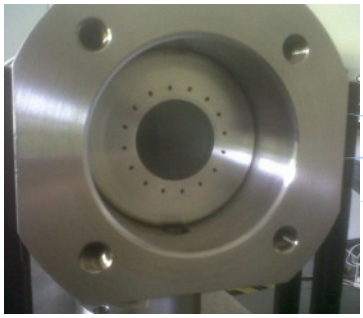
The CANTY SolidSizer™ is a vision-based sensor used with the CANTY Vector System image processor for dry particle size measurement in a laboratory environment. The CantyVision™ Software accurately measures multiple aspects of the particles from area / perimeter / minor and major axis / etc. In comparison to a sieve which measures only minor axis the CantyVision™ software can correlate directly to a sieve so the customer does not have to change any QC documents. The SolidSizer™ can correlate within 2% of a sieve or screen with 99% repeatability. A typical sieve analysis takes anywhere from 20-30 minutes including cleaning and setup for a 70-100 gram sample. On the SolidSizer™ that same sample takes less than 2 minutes. Also multiple screen distributions can be setup to accommodate multiple customers or areas in the process, hence eliminating the need for multiple runs on the same particles for different size distributions. The inflow is available so to make the same exact measurement without having to dry the product. Reduce lab time and make sure production samples are not skipped over due to lack of sample time available!

Available in a number on configurations - **direct online, side stream, or portable** - the InFlow™ can be used anywhere within a produced water plant to optimize each stage of separation, to ensure any separation equipment is running at maximum efficiency, and any environmental discharge limits are reached.

The performance of any separation equipment (hydrocyclone, CFU, IGF, membrane filters…..) is based on operating at the correct configuration for the inlet fluid condition. Similarly, the dosing volume / rate of production chemicals such as emulsion breakers or droplet coalescers, is based on understanding what is present within the fluid to be treated. The InFlow™ delivers this information, providing real time data for oil concentration & droplet size, and total suspended solids concentration and particle size.

IGF INLET	IGF OUTLET	FILTER OUTLET
		

SEPARATOR / FILTER OPTIMIZATION - CHEMICAL DOSING CONTROL - ENVIRONMENTAL REPORTING



OIL / TSS in WATER ANALYSIS

For More Information Click **Here**

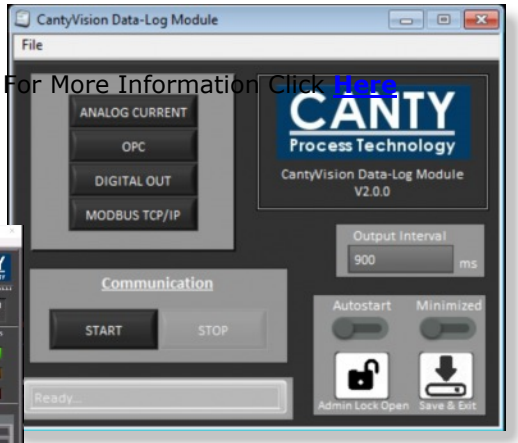
- Variable concentration range setting; 0-10ppm, 0-100ppm, 0-1,000ppm, 0-10,000ppm
- Options to 80,000ppm
- Particle sizing to 0.7µm
- Fused Glass Windows - Options to 600 BAR
- High Intensity LED Lighting
- Gigabit Ethernet Camera Technology

Vector Control Module

Anyfouling

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.



For More Information Click **Here**

- 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
- CantyVision™ Software installed
- Full administrative control embedded operating system
- Fan-less solid state vision control system

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 THE COMPANIES WE HAVE WORKED WITH

ARCELORMITTAL
AUSTRALIAN ABRASIVE MINERALS
FREEPORT-MCMORAN
MISSISSIPPI SANDS
NEWMONT
SASOL MINING
SIERRA FRAC SAND
SIL SILICA
U.S. SILICA

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