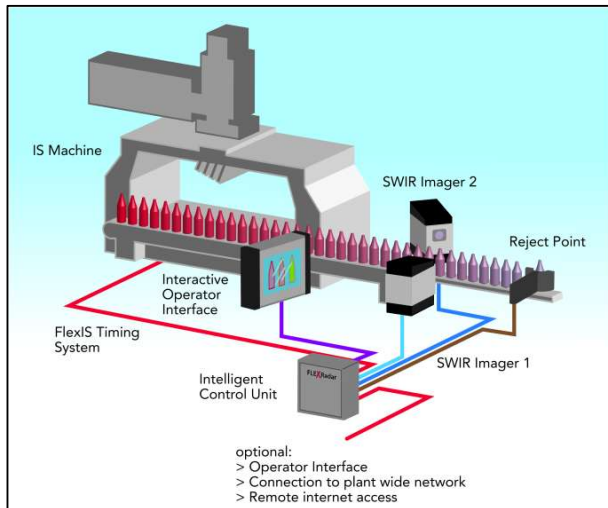


Technical News Bulletin

Cham June, 2012

FLEXRadar Forming Process Analyzer



Introduction

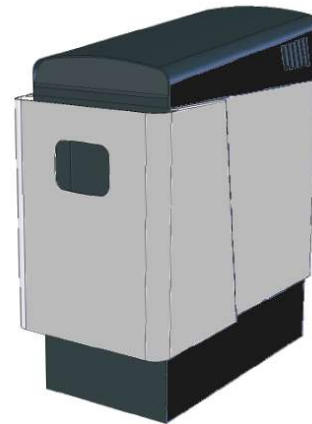
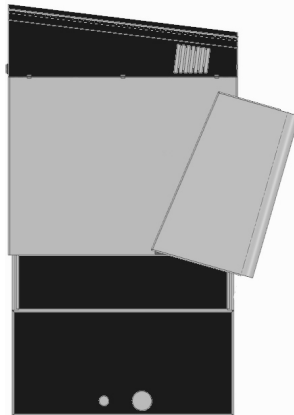
The FlexRadar is a glass forming process analyzer utilizing high resolution infrared technology. It identifies “**in real time**” glass forming process deviations and quality issues. The FlexRadar monitors the container geometry, glass distribution in both vertical and horizontal axis and its position on the conveyor to identify cavities producing containers falling outside the standard quality criteria's. The display provides “**instant**” forming process quality feedback to identify “**unseen**” potential improvements, early warnings and to force for continuous improvement.

System Description

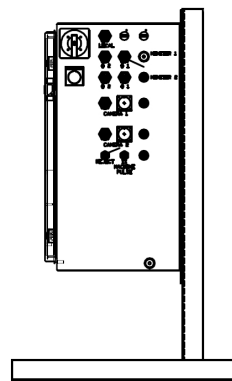
This stand alone system includes two **SWIR Imager's** (Short Wavelength InfraRed Imager with 1024 pixel cameras, solid-state and backup vortex cooling), one **Intelligent Control Unit**, one **Interactive Operator Interface** (19" high temperature color LCD touch screen display) and one air reject assembly.

Hardware

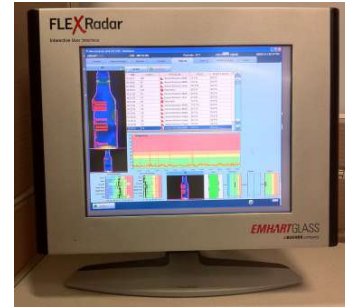
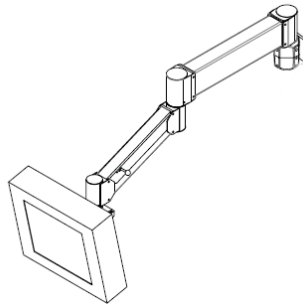
SWIR - Short Wavelength InfraRed Imager with solid-state cooling and vortex air backup. They are used to acquire thermal images of each passing container and operate on 24V DC with Ethernet connections supplied by the Intelligent Control Unit. Maximum cable length to control unit is 90 meters.



Intelligent Control Unit - contains the computers and controls and is equipped with fans for installation in temperature control room or with an optional air conditioning unit for the factory floor installation. It supplies power and signals needed for the SWIRS and Interactive Operator Interface.

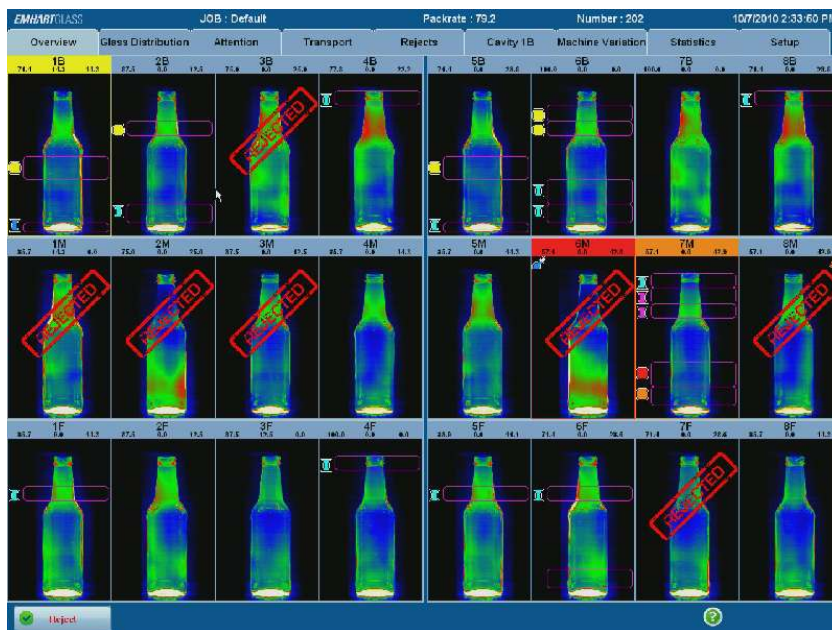


Interactive Operator Interface - contains the 19" high temperature color LCD touch screen display and can be located near the operator side of the IS machine on an articulated arm. Vortex coolers are installed for high temperature environment. An optional desktop stand is available for control room installation. Maximum cable length to control unit is 90 meters.

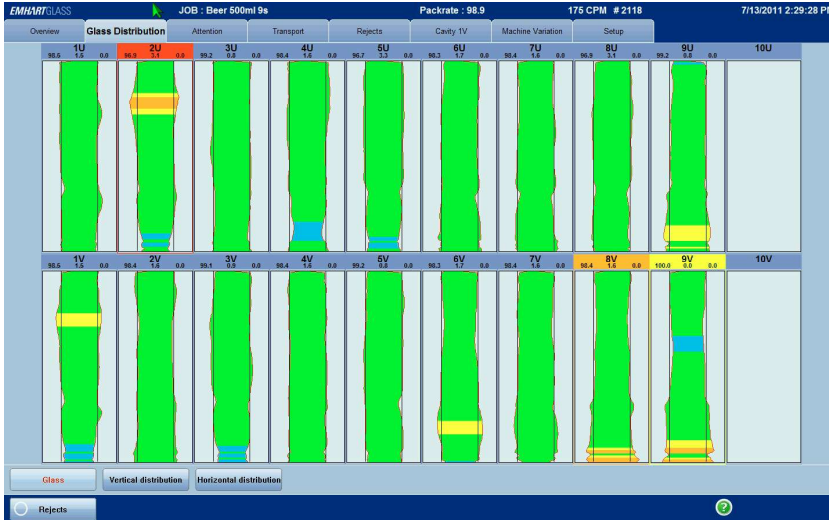


Software

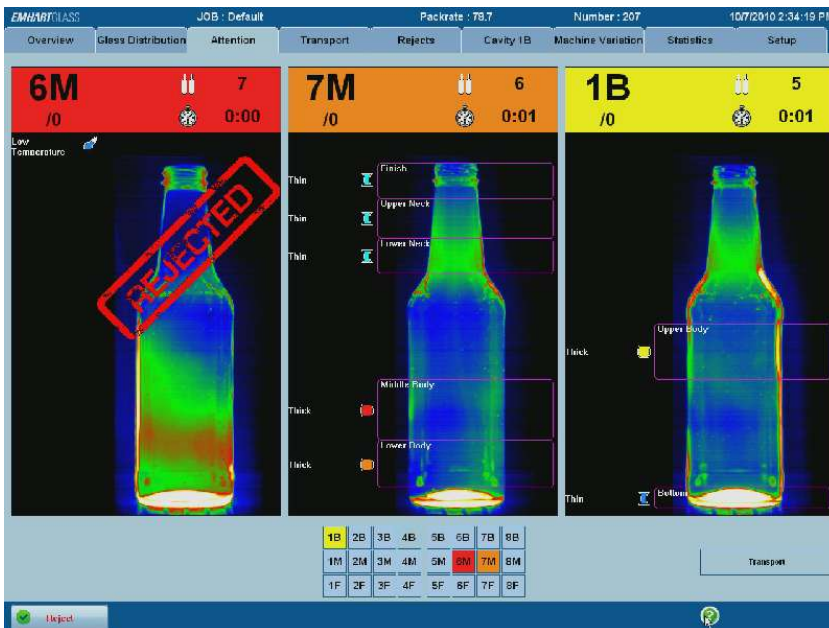
Overview Screen - displays “live” thermal images of all of the containers on one screen. An icon based identification visually highlights problem areas next to the containers image as well as reject information. The basic job information including line speed and pack rate per cavity is also displayed on this screen.



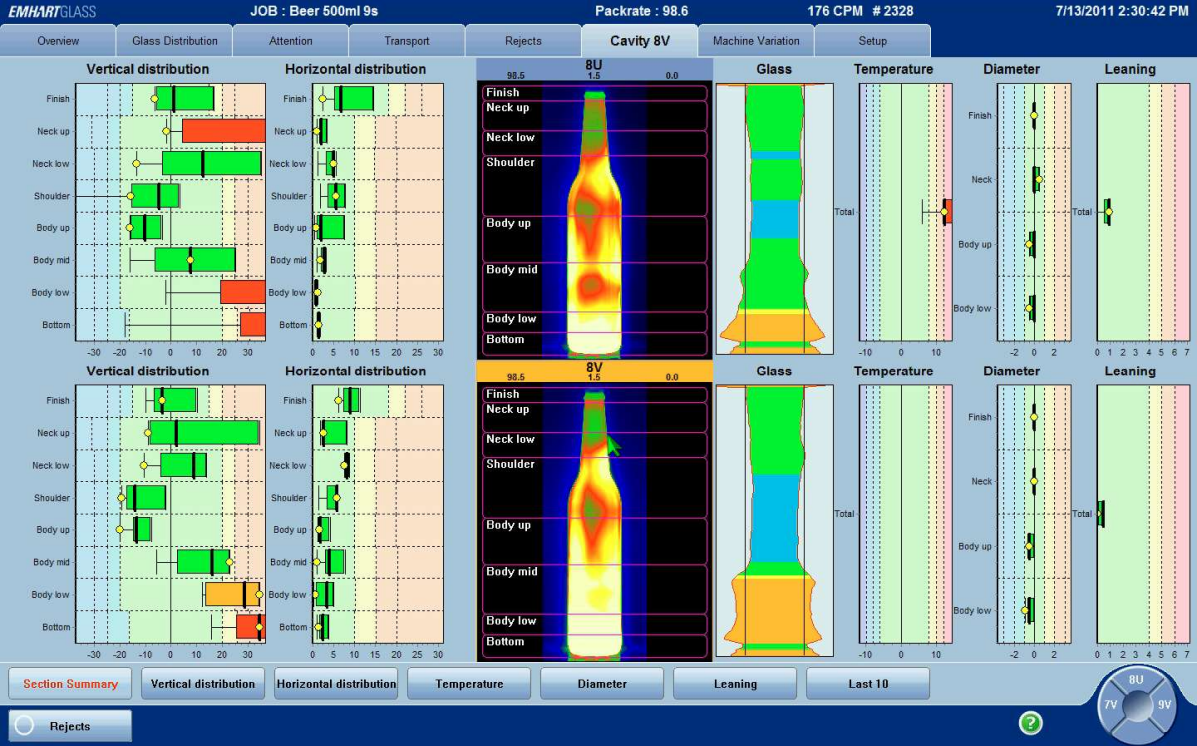
Glass Distribution Screen - graphically displays each container horizontal and vertical glass distribution in an easy-to-identify pattern. This allows the operator to determine which container is the outlier (value far from most others) while also indicating the type and area of the glass distribution problem.



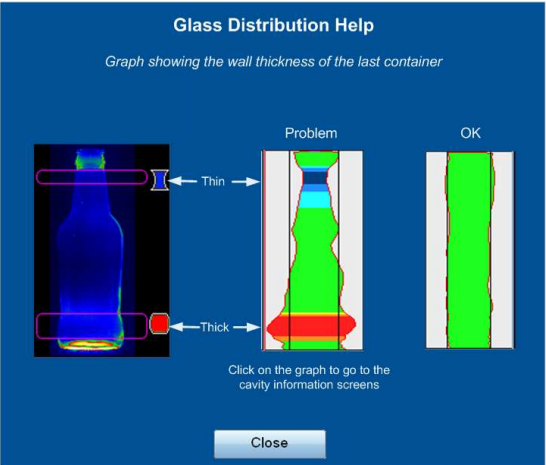
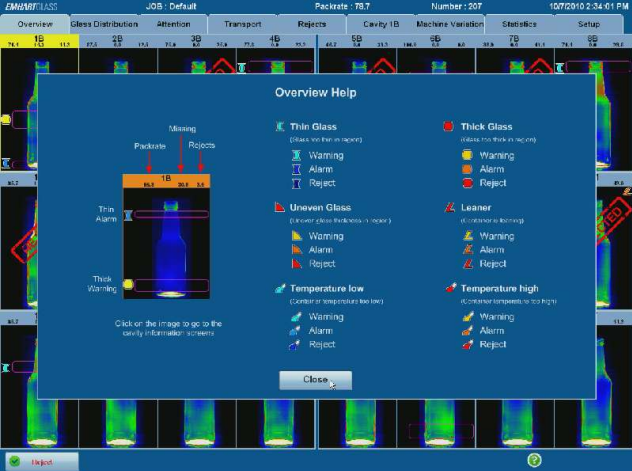
Attention - Warning Screen - provides the operator with the worst three cavities producing the outliers (questionable quality). The screen displays the thermal image of the container with the problem area on the container. Statistical data and mold number information is also available on this easy-to-use screen.



Expert Screens – are available for the production specialist who needs detailed information on a specific cavity or section. All statistical data gathered by the FlexRadar provides these easy to use screens.



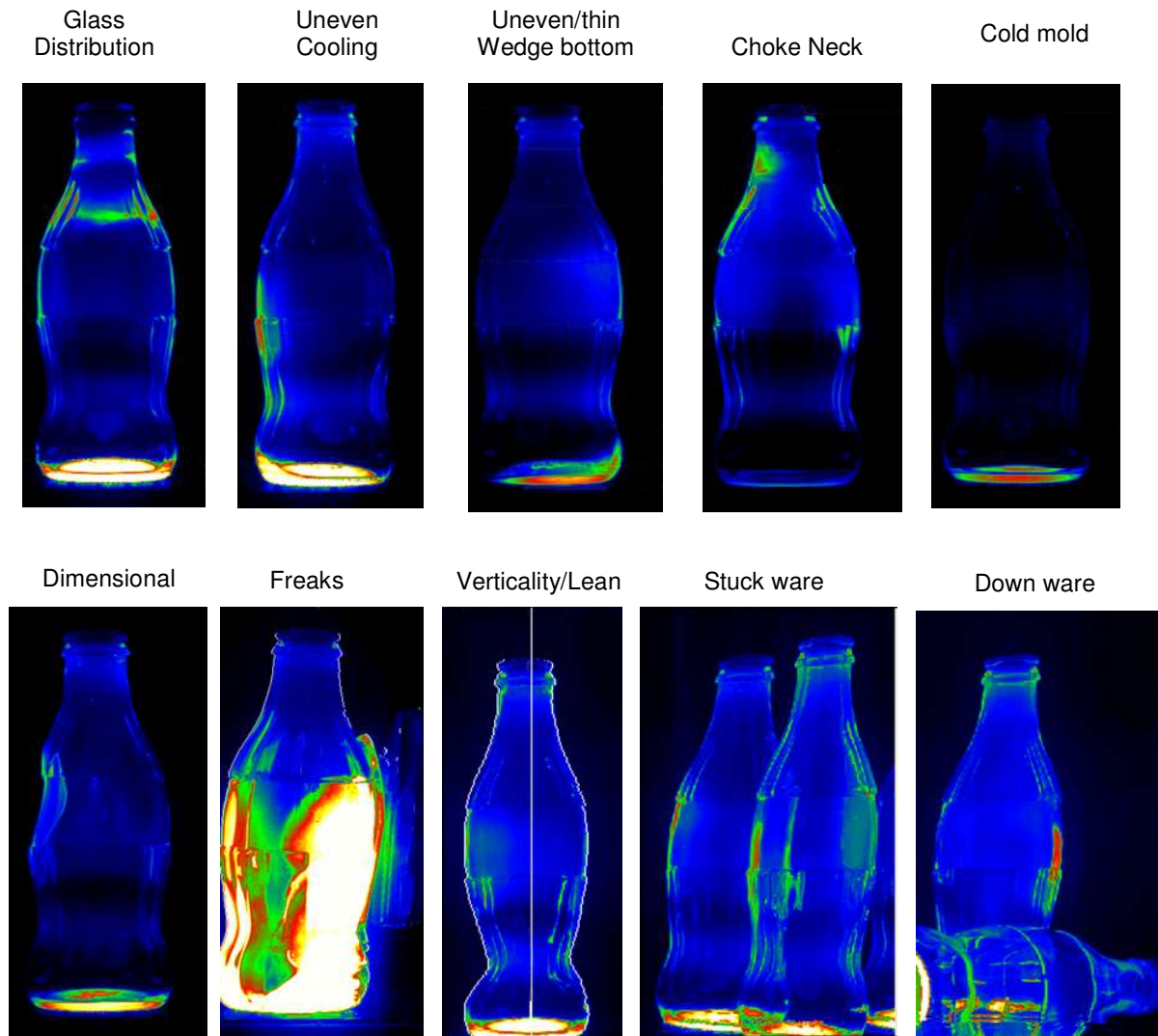
Built in help screens guide the user through system functions when pressing the “?” icon.



Availability / Application

The FlexRadar can be installed on any glass container production line to monitor, analyze and improve production. It supports container speeds up to 1000 CPM, the complete color range including non-round and unusual shapes and support multiple production (Multi Gob Weight System).

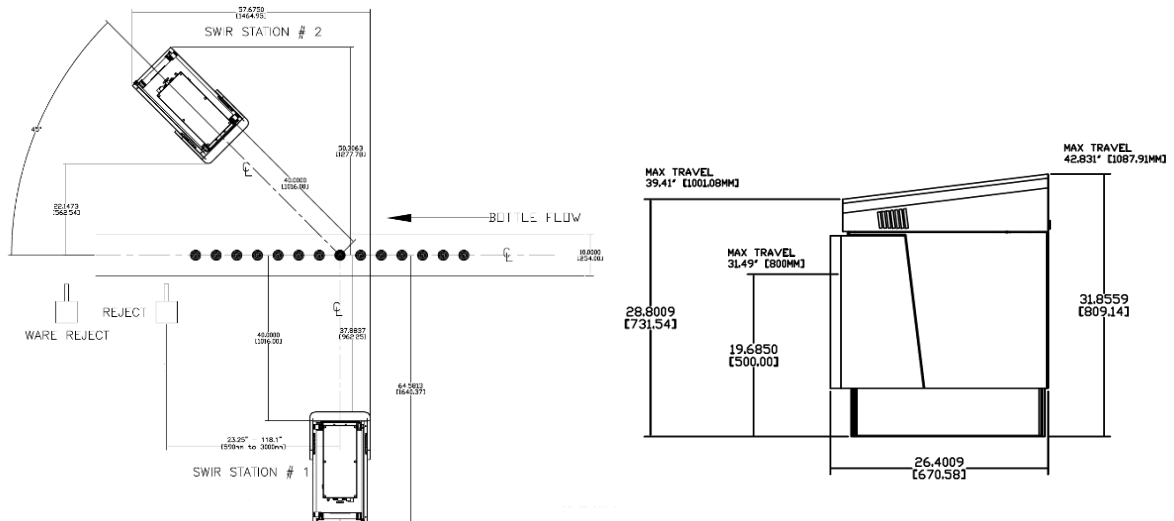
Container Thermal Images



Installation Requirements

Electrical Power:	230VAC 50/60 HZ, Single Phase 20 amps
Compressed Air:	6 bar / 87 PSI minimum, 12 CFM
Humidity:	10% - 80% (non condensing)
Temperature:	0-55° C

Required Space



Drawings:

FlexRadar Assembly	11000D
Line layout "footprint"	11100D
Wiring diagram	11001D

Options

- Air-conditioned Intelligent Control Unit.
- Additional operator interface including both desktop and articulating arm installations.
- Connection to plant networks.
- Remote technical support and production specialist assistance.

Features / Benefits

Features	Benefits
Live thermal Infrared container images	User can quickly identify which cavities are producing "critical" containers - images from every cavity on one screen. "Live" quality control = higher pack
Dedicated glass distribution screen	Graphical display of each containers horizontal and vertical glass distribution from every cavity on one easy to view screen. "Live" quality control = higher pack
Operator attention screen	Displays the top three outlying cavities producing containers which are outside the normal population. Impose continue improvement = higher pack
Flexible installation configurations	Supports multiple products on same production line as well as tandem IS machines. Covers Multi Gob Weight System = flexibility
Container geometry verification	Measures and identifies lean, diameter, freaks, fallen and stuck containers "Live" quality control = higher pack
Internet remote access	Plant management and production specialists (Emhart) can remotely supervise production and provide technical support and assistance. Plant personal can monitor production through mobile devices like smart phones and tablets. "Live" supervision - support = higher pack