Bazell Technologies Corporation
COLA Meeting 29 April 2016

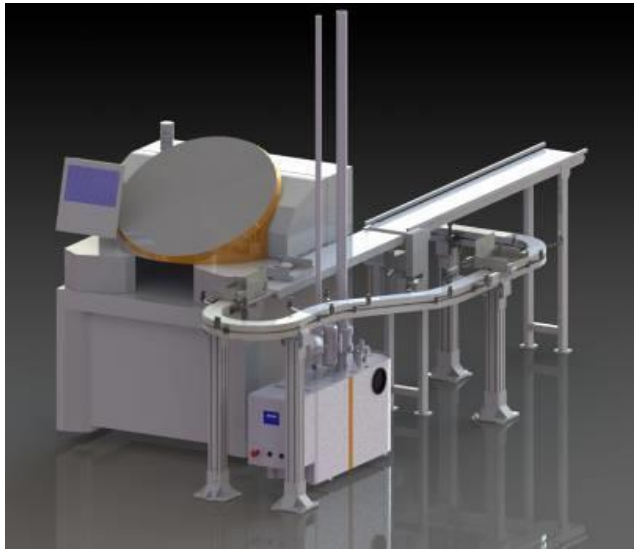
About Bazell Technologies

- Founded in 1983, the Company is now a wholly owned subsidiary of Essilor/Satisloh. Our sole focus is fluid management systems for a variety of industries
  - Ophthalmic lens production
  - Precision optics and scientific glass materials
  - Automotive, aerospace, and general industrial manufacturing processes across a wide range of fluids and materials
- The common ownership with Essilor/Satisloh has given us a unique view to materials, processes, and laboratory production methodologies to the benefit of our mutual customers worldwide

Range of Experience

- Since 1998, Bazell Technologies has installed more fluid management systems in the North American market than all other suppliers in this segment
  - 330 Multi-generator systems
  - 107 Single generator systems
  - 436 Small tank systems (generators & edgers)
  - 348 Pump Stations
- Following is an overview of those products

Products: Pump Station



Key element in most ophthalmic products

Pumps coolant, chips, long turning strands, and lens tape thru overhead pipe

Traps large alloy segments and deblocked lenses

Small footprint

Hundreds operating around the world

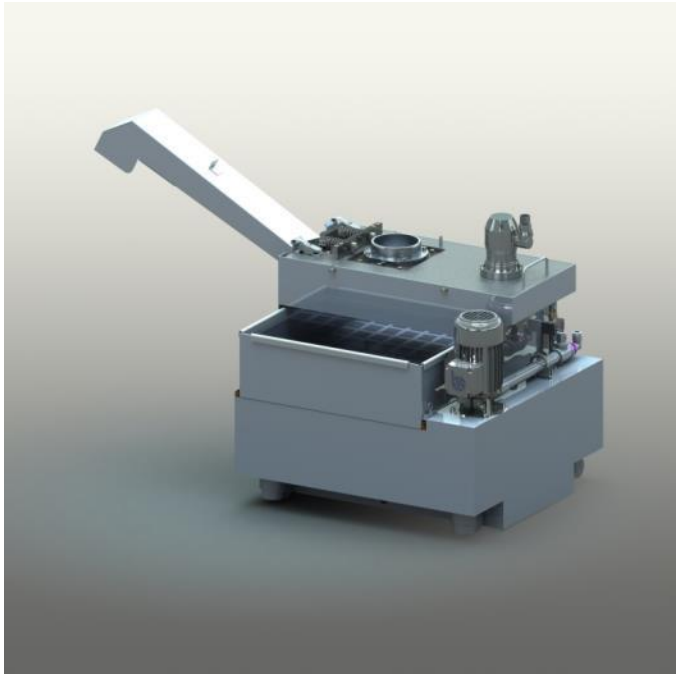
Products: Chip Compactor Assembly

Efficiently dispose or recycle chip waste

The Chip Compactor Assembly connects directly to the pipeline from the respective Pump Station. The Chip Compactor drains all fluid and small debris into the main system dirty tank by gravity – no intermediate pumping required.

Products: MicroGenerator

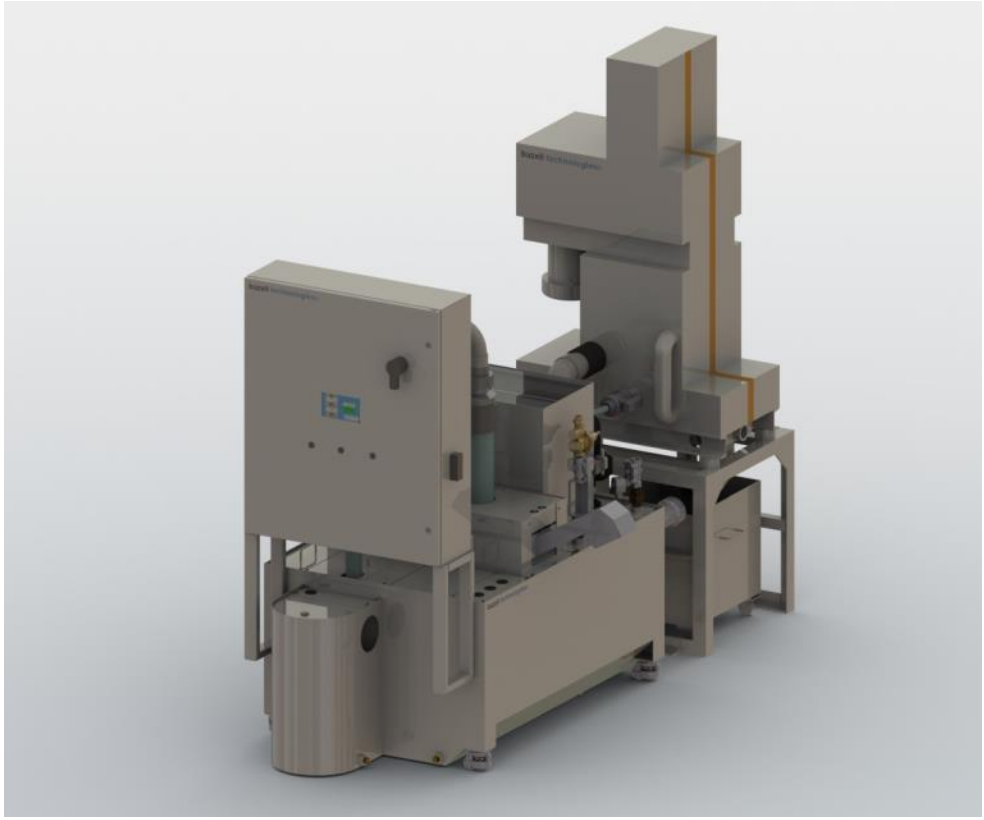
System for Satisloh VFT-Micro Generator



Solution to fit inside the base of the machine

Products: HC1

System for 1 Generator



HC1 Automated System
Including Pump Station
Compactor
Self-Cleaning Centrifuge

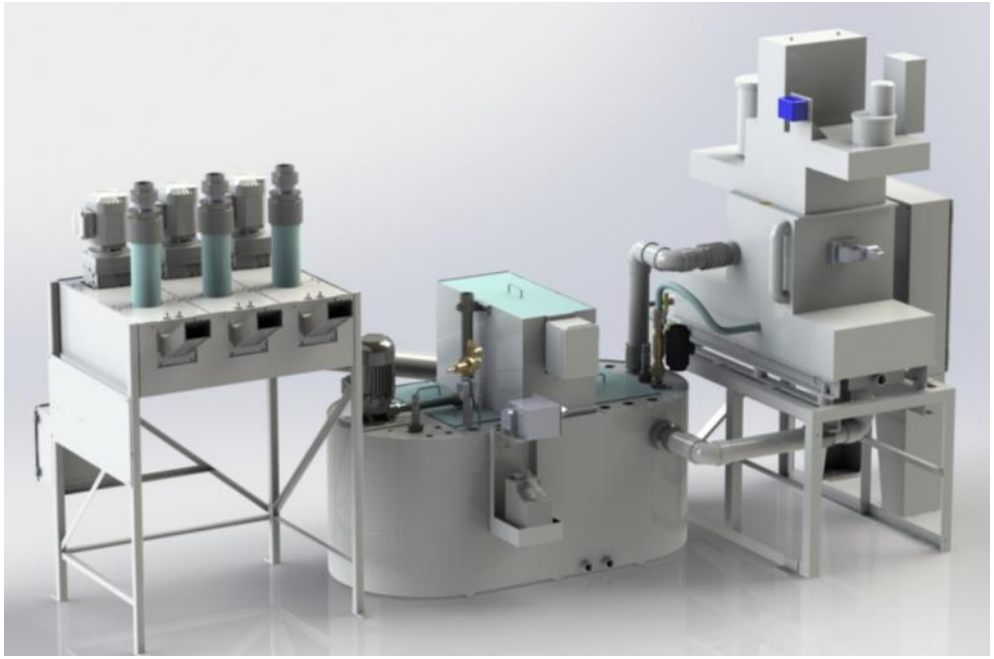
Products: ICS-Pro

System for 1 Generator

Including Pump Station Compactor and Static Filter

Products: Microseparator® & HC3

System for 2-3 Generators

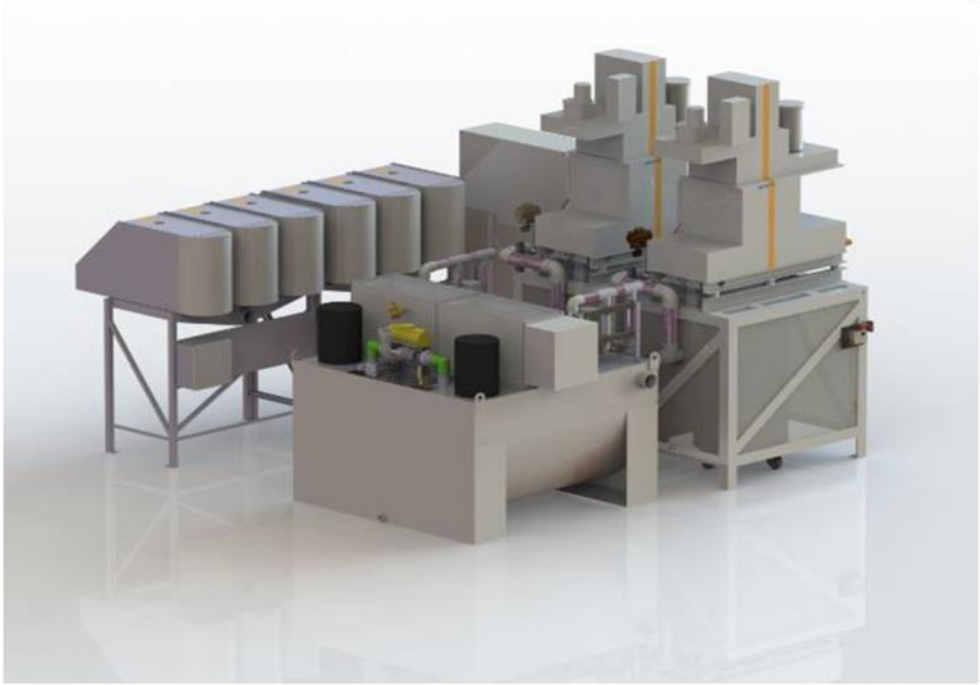


Automatic System with self-cleaning centrifuge

Over 300 built in this type range

Products: HC6

System for 6 Generators



Never has a component failure stopped production! Redundancy is key

HC6 – Best in Class Solution

Thirty systems built – operating across North America, Europe, Asia, and So. America

Our most popular system by far. Qualified worldwide by the leading ophthalmic laboratories

Products: HC6

Systems for 18 robotic generators

Project Engineering and **Field Service**

Coolant Management – Engineered Process

Key Elements of High Capacity Systems

Redundancy

- Every major operating element has a redundant pair
- Components serviced without stopping production

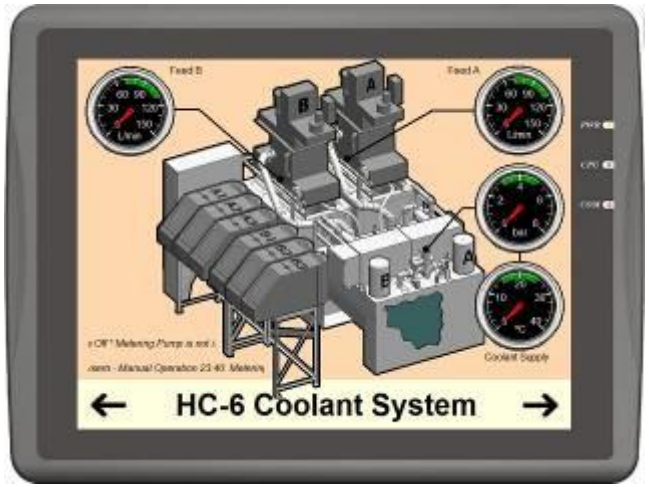
Productivity

- Hands free material processing end to end
- Elimination of manual operator functions from generator drain to waste discharge
- Designed for continuous 24/7 production

Process Control

- Automation of optimum fluid flow/pressure, operating temperature, fluid clarity, and additive management
- Optimizes generator performance while reducing maintenance and increasing tool life

Elements: System Electrical Controls



Touch screen graphical HMI for control of all devices and settings

Allows prompt visual confirmation of operational status and alarm history

Integrated history and graphical data tracking to SD card

Remote Operation and Diagnostics

Local and Remote operation thru VNC®

- Multi-platform applications – iOS, PC, OSx, Android
- Customer LAN and VPN access
- Remote Alarm Monitoring and Clearing
- Allows Bazell remote system access (if VPN access granted)

Remote PLC and HMI code updates if connection provided

bazell technologies®

Challenges for PC Debris Recycling

- Mixed material processing – plastics/polycarbonate/Trivex in many different formulations. Most labs cannot justify segregation of material type by generator although our systems make that possible for those that can
- Presence of lens tape and adhesives
- Presence of alloy fractions that cannot be separated at the point of processing – the absence of careful control of the blocking process combined with aggressive cribbing macros and small diameter blocking rings are especially prone to a high level of alloy contamination
- Presence of residual coolants and oils (all but one defoamer on the market is oil based)
- Presence of microbial contaminants that occur in many laboratories (i.e. fungal or bacterial contamination)
- Continued evolution of plastic lenses and the market growth of hi-index and Trivex lens production
- Current alloy free technologies use a plastic block that is sacrificial along the lens diameter during cribbing

Long History of Work - Recycling PC

- Over 10 years ago we worked closely with Paul Ponder and his Team at Maui Jim to build an automated coolant management system with compacting capability allowing recycling of all PC waste from 6 generators
- The market for that waste has since evaporated yet the system continues to operate reliably to this day

What's possible…….

- May not be justifiable financially or environmentally nor appropriate for the ophthalmic lab
- This photo shows PC debris compacted to a ratio of 20:1 – virtually a solid block of PC waste

Closing Thoughts

- Maximizing the dryness and minimizing the volume of waste can have diminishing returns, if:
  - A single compacting device is used for multiple generators since one failure of this component can have drastic consequences for lab operations – redundancy must be preserved
  - Technologies used are inappropriate to the lab environment and skill set of lab maintenance personnel
- The volume of available waste may be too small and the cost to transport and repurpose waste materials too high to create a truly sustainable, cost neutral structure for ophthalmic lens waste recycling/repurposing
- The future is likely a quantum shift to additive vs subtractive manufacturing in the production of ophthalmic lenses – many key patents have already been filed for this technology – the future is right around the corner