Precision Yeast Harvesting

In brewing, yeast harvesting is a critical step that directly affects beer quality, process consistency, and the bottom line. Yet in many breweries, this step is still managed in a traditional way with a quick look through a sight glass and a judgment call. This approach has real limitations because it's subjective and inconsistent. Real time inline turbidity measurement changes all of that.

YEAST MANAGEMENT AS A QUALITY FOUNDATION

Yeast management starts well before the storage tank and continues through harvesting, re-pitching, and eventual yeast disposal or sale. It covers the controlled propagation of healthy pure-culture strains, hygienic storage conditions, and precise harvesting for subsequent batches. Routine quality checks for vitality, contamination, and fermentation performance are what keeps beer quality consistent across multiple generations of yeast use.

Yeast is a valuable commodity. Spent brewing yeast can be repurposed or sold for food ingredients, animal nutrition, biotechnology, cosmetics, as long as it's microbiologically clean, vital, and free of off-flavors. Careful harvesting is what makes that possible.

THE TRADITIONAL APPROACH: EXPERIENCE-DEPENDENT AND HARD TO STANDARDIZE

Timing is everything in yeast harvesting. Pulling the yeast too early is inefficient and wasteful because you're capturing a fraction with too little biomass. Wait too long, and undesirable byproducts can develop that compromise both flavor and filterability.

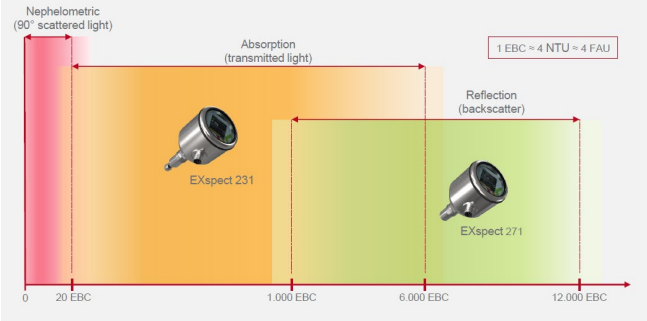
While sight glasses have long been the go-to tool for making this call, they do come with some fundamental drawbacks:

- **Subjectivity**: Clarity assessments depend on the operator's experience and can vary operator to operator, shift to shift.
- **Limited resolution**: Subtle turbidity differences that are often the most important ones for a clean phase separation simply aren't visible to the naked eye.
- **No data trail**: Without automated logging, there's no process record and no traceability.

In short, a sight glass is a feel-based tool, not a process control tool.

INLINE TURBIDITY MEASUREMENT: A BETTER WAY

Inline turbidity sensors, whether based on absorption or backscatter technology, continuously monitor product clarity in real time, right inside the process line. They detect the smallest shifts in solids concentration and can trigger precise, automated responses the moment phase transitions begin or end.



Turbidity sensor technology varies depending upon operating measurement range

The practical benefits are significant:

- **Objective, repeatable measurement** — threshold-based control replaces gut-feel decisions
- **Automated response** — automation system valve control tied directly to sensor input eliminates manual intervention
- **Higher yield** — more green beer recovered, less lost to incomplete harvesting
- **Better beer quality** — reduced yeast carryover means cleaner, more filterable beer
- **Complete process records** — automatic data logging supports quality assurance and compliance
- **CIP compatibility** — no hygiene compromises as sensors clean in place with the rest of the system

SEASONAL VARIABILITY

Yeast behavior isn't constant year-round. Summer strains tend to be more active, settle faster, and generate more CO_2. Winter strains are typically more viscous, slower to sediment, and need longer clarification times. A well-configured control system automatically loads appropriate harvesting turbidity thresholds based on yeast type and ambient temperature to keep the process consistent regardless of season.

A REAL-WORLD EXAMPLE

One mid-sized brewery replaced its sight glass-based harvesting process with an inline turbidity sensor from the EXspect 271 series by Exner (Exner also offers the more compact EXplore 171, both of which use backscatter technology). The results were clear-cut:

Attribute	Before (Sight Glass)	After (Turbidity Sensor)
Yeast Loss	High	Significantly Reduced
Green Beer Clarity	Variable	Consistently High
Filtration Load	High	Significantly Reduced
Documentation	Manual	Automatic
Process Control	Experience-Based	System-Controlled

Performance difference between sight glass and turbidity sensor detection

Beyond process improvements, the brewery was also able to generate additional revenue from the selling of the harvested yeast as it now consistently met the quality required for commercial reuse.

THE BOTTOM LINE

Switching from a sight glass to inline turbidity measurement isn't just a technology upgrade, it's a step change in how the process is controlled. Yeast is harvested at the right moment, every time, with full documentation and no operator-to-operator variability. The payoff shows up in product consistency, reduced losses, lower filtration costs, and in some cases, an increased, even new revenue stream from yeast sales.

For breweries looking to tighten up their process and increase the bottom line, this is one of the “clearest” wins available.

EXspect Turbidity Sensor

- Reliable phase boundary detection
- Absorbance Technique (EXspect 231)
- Backscatter Technique (EXspect 271)
- Stable performance
- Low maintenance
- EHEDG/3A certified
- CIP/SIP capable
- Selection of process connections

GET IN TOUCH

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