

- hygienic process equipment
- system engineering and design



- fabrication and installation
- over 100 years of excellence

Process Engineering, Design, Brewing Equipment, Fabrication, Installation

Engineering Solutions for the Brewing Industry

Deaerated Water (DAW)

- Oxygen is detrimental to the stability of beer. It can develop off flavors, formation of beer haze, and shelf life can suffer.
- The water that comes into contact with fermented beer and is used in the brewing process to push out product and additives for the final beer should be Deaerated Water (DAW).

SOLUTION: Deaerated Water Skid

- ✓ Achieves Brewing Water with low Dissolved Oxygen levels (less than 0.02 ppm)
- ✓ The systems are designed and installed for low-capacity demands (up to 34 bbl/h) or high-capacity models (up to 500 bbl/hr) designed to meet any particular demand

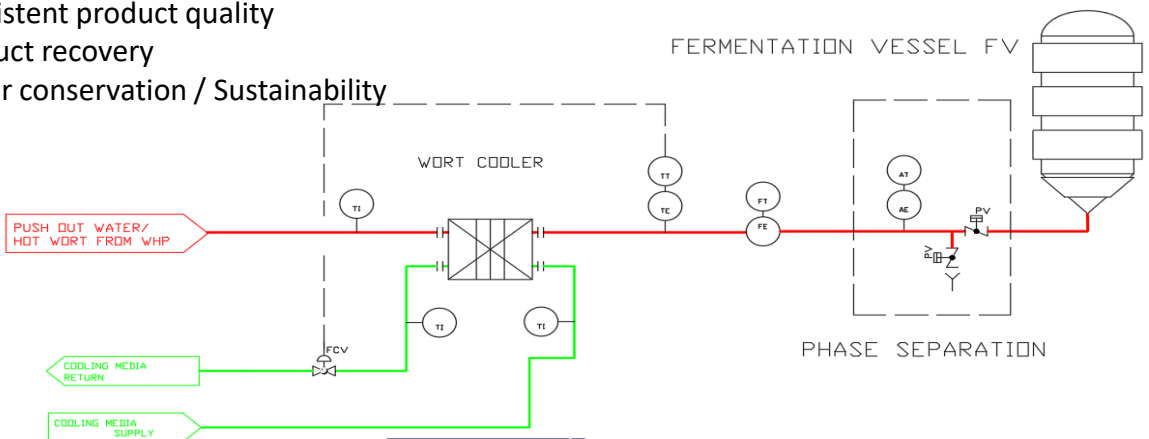


Phase Separation

- Product-Water, Water-Product, Product-Product phase separation is a challenge resulting in product loss.
- Without large scale automation it is possible to precisely detect the transition between Water and Product in the different steps of the process.
- Reliable detection in the brewhouse, in the cellar and in the filler room reduces the loss of wort and beer and provides product safety.

SOLUTION: Phase Separation Detection System

- ✓ ROI with a Phase Separation Solution realized within a few months
- ✓ Consistent product quality
- ✓ Product recovery
- ✓ Water conservation / Sustainability



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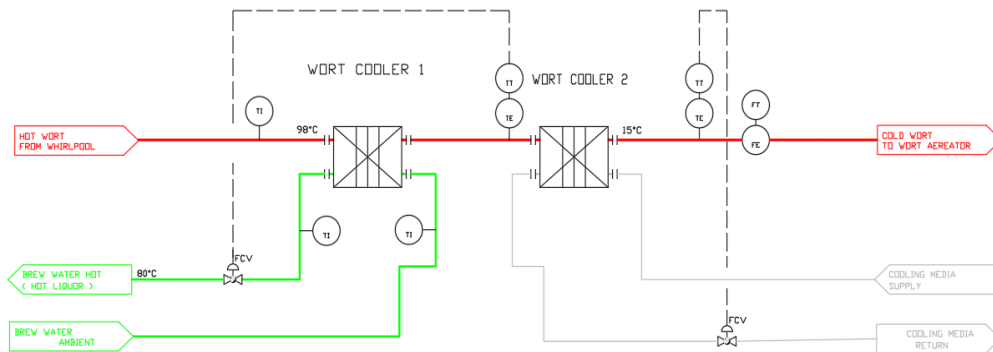
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Energy Recovery during Wort Cooling

- Refrigeration and Hot Brewing Water capacity are limited in the brewery and energy costs are increasing.

SOLUTION: Two Step Wort Cooling

- ✓ Reduce energy costs
- ✓ Reduces the heat load of the current refrigeration plant as much as 50%
- ✓ Increase the capacity of the hot liquor system by preheating the hot liquor needed in the brewing process

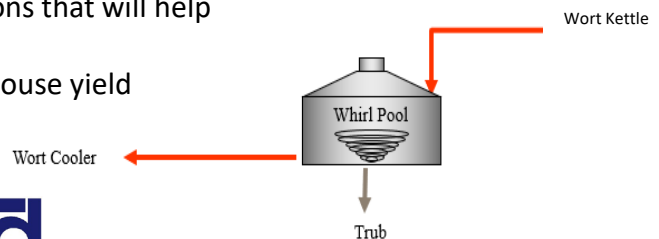


Wort Clarification

- Post boil hop and ingredients added in the Whirlpool is an ongoing practice that promotes more flavor and aroma and defines the character of the beer.
- It is often associated with challenges in the wort clarification, product quality and high beer losses.
- Worts that have not been clarified may be slow to ferment, and the resulting beer may be difficult to filter.

SOLUTION: Whirlpool Assessment

- ✓ Whirlpool assessment allows identifying solutions that will help for optimal Wort- Trub separation
- ✓ Minimizes product losses and increasing Brewhouse yield



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Wort Aeration and Yeast Pitching

- The correct introduction of oxygen at the initial step of the fermentation is essential for yeast cell growth.
- Inadequate yeast growth can cause long fermentation, undesirable flavor and aroma compounds, and yeast not suitable for harvesting and re-pitch.

SOLUTION: Wort Aeration and Yeast Pitching Skid

- ✓ The yeast pitching flow and wort oxygen level are controlling according to the wort flow
- ✓ The airflow and wort flow is controlled proportionally for optimum process results

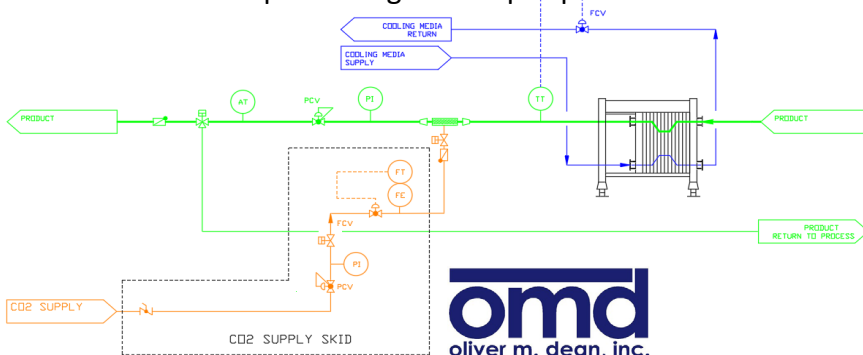


CO2 distribution and Pressure/Flow control in the point of use

- CO2 is an indispensable component in the beer brewing process. Tanks and bottles are purged with CO2 before filling to remove air and protect the product against oxidation.
- The precise level of CO2 in the beer in combination with the hop bitterness form the backbone of a beer's palate sensation.

SOLUTION: CO2 Distribution Skid

- ✓ Constant and controlled CO2 supply in the different steps of the process
- ✓ Consistent results
- ✓ CO2 savings
- ✓ Minimize costs for reprocessing out of spec product



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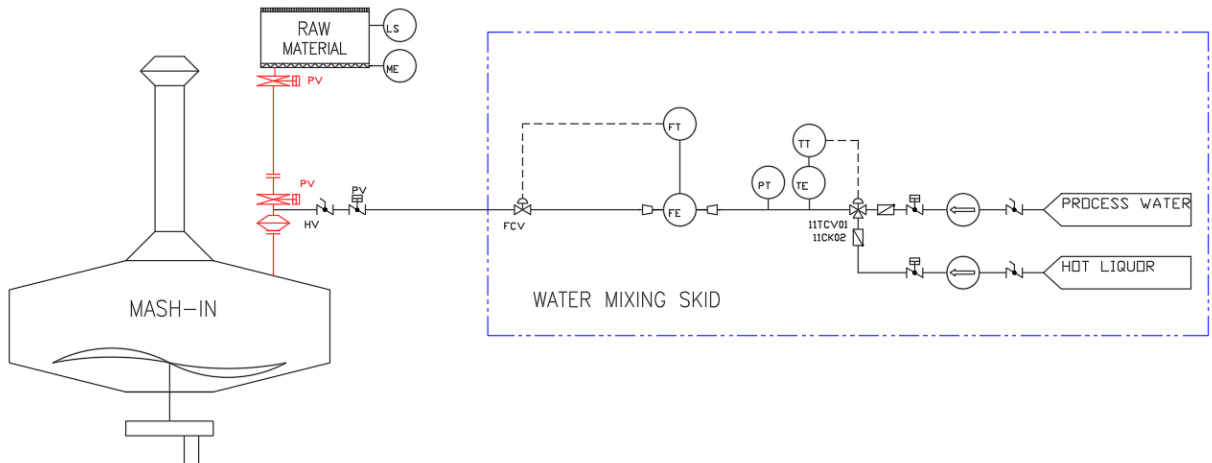
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Brew water addition

- The temperature of the Mash-in water is essential to produce a good mash and requires careful management.
- The “strike water” triggers the enzymatic activity that breaks down starch to convert into fermentable sugar, proteins, and cell wall materials to create the wort.

SOLUTION: Mixing Water Skid

- ✓ Accurate temperature and flow control of the Mash-in and Sparge Water Addition
- ✓ Consistent product quality



Microbial Growth Mitigation

- In beverage production, microbial disinfection is imperative.
- Viruses, bacteria must be prevented.



SOLUTION: UV Water Treatment Skid

- ✓ Alternative to chemical methods of disinfection
- ✓ Requires little effort and has minimum impact on the environment
- ✓ UV disinfection can be performed immediately before use
- ✓ Cost-effective way of disinfecting water for the sanitary processing industry
- ✓ Water treatment applications using UV technology:
 - Pre-Treatment Disinfection /Pre-Activated Carbon and Post-Activated Carbon
 - Direct Contact water or Ingredient
 - CIP, Bottle Rinse or Wash Waters
 - Tank headspace and venting