

Ontario Technical Conference 2014  
100 Years of Master Brewers Association of Canada



Requirements for Brewery Fermentation and Maturation Tanks.  
Hygienic Design and other Aspects



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Ontario Technical Conference 2014

Requirements for Brewery Fermentation and Maturation Tanks.

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- Brewery Layout
- Basic Tank Design
- Tank Cleaning
- Hygienic Design
- Dry Hopping
- Other Aspects and Details
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Requirements for Brewery Fermentation and Maturation Tanks.

### Brewery Layout

**Thesis 1: „ Brewers spend to much time in engineering compared to brewing!“**

Tank dimensions and numbers are growing faster than the brewery

Master planning is essential

Think big, but start small

Look for long-term partners

Make flexible long-term agreements



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### Brewery Layout

Layout is dictated by costs, area, building, climate and transport conditions  
but also by brewery and working philosophy:

Indoor

Traditional standard or customized?



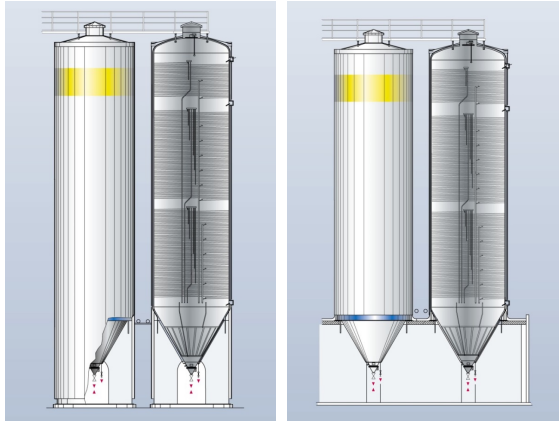
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**Outdoor**  
Economic or showpiece?



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**Example: Dogfish Head Brewing**  
Starting with 6 Tanks, now having 30 CCT's, 6 BBT's and 7 Yeast Tanks)



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### Basic Tank Design

**Thesis 2: „Tanks have to be tight, huge enough, and ...flexible!“**

Add max. cooling to the tank

Cooling design for different filling levels / brews

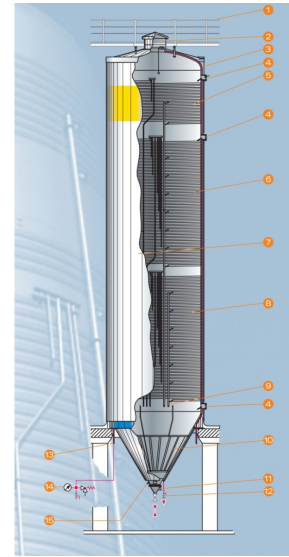
Working pressure of 1.5, better 2.0 bars allows to use the tanks  
as fermenters and/or bright beer tanks

Outlet heigh min. 1.2m / 4in to allow use of pipe fence and / or standpipe

Spare pipes for dry hopping, water supply, cables

Dome plate to add / modify tank top fittings

Blind flanges for LL / PT



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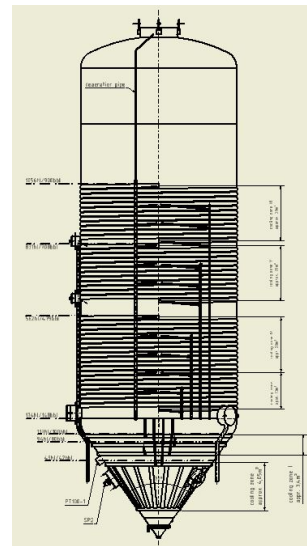
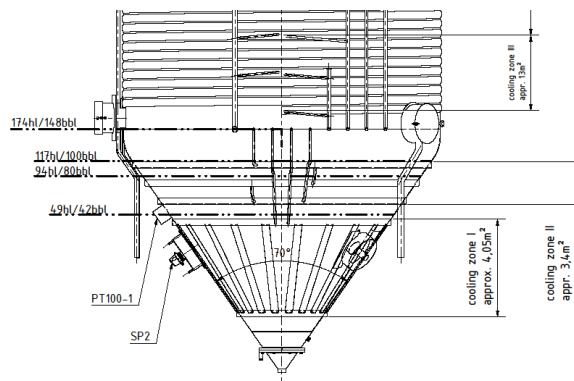
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### Basic Tank Design

Example: Min. 42 bbl filling volume at a 1.340 bbl tank



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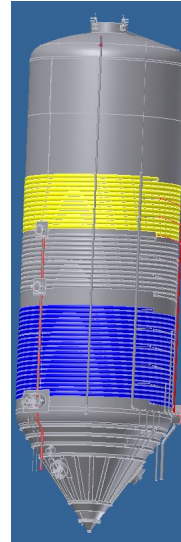
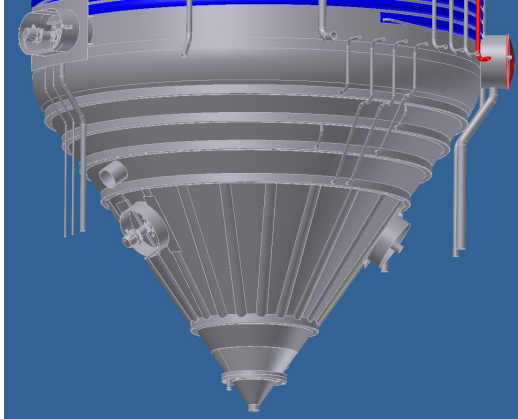
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### Tank Cleaning

Thesis 3: „Cleaning is too expensive!“

Most breweries are cleaning too often,  
too hot and too long

Avoid manual activities

Adapt your cleaning procedure to the  
equipment (i.e. inner surfaces)



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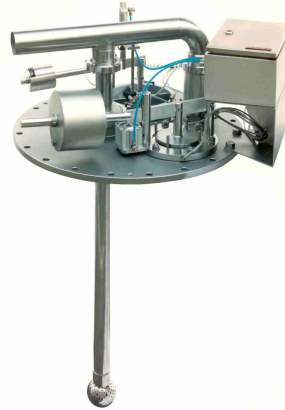
### Tank Cleaning

#### Hot Cleaning

Pro: Safe Process  
Easy to handle  
Con: Expensive

#### Sprayball or Cleaning Machine?

Note: tank cleaning is first a chemical process, supported by temperature and pressure



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### Hygienic Design

**Thesis 4: „Hygienic Design is the most effective cost savings program in the cellar!“**

The real quality of a tank is defined by the the inner surface, not by the outside cladding  
Hygienic design is defined by technical details and must be controlled



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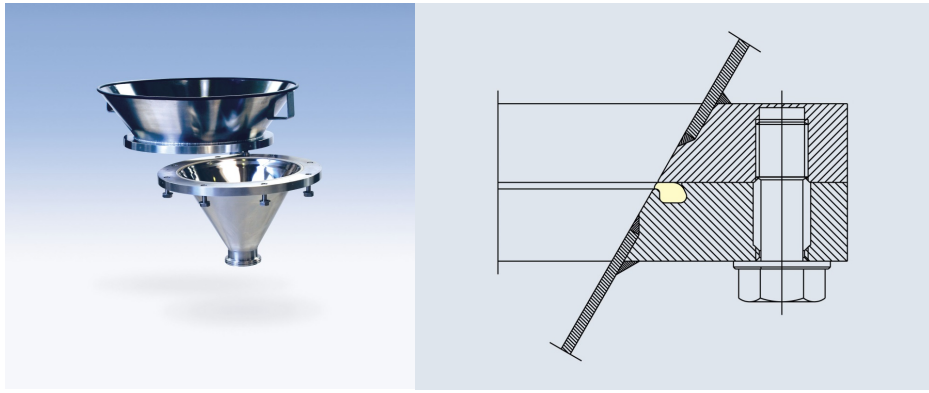
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### Hygienic Design

Design of all inlets and outlets, i.e. flanges, manholes etc.



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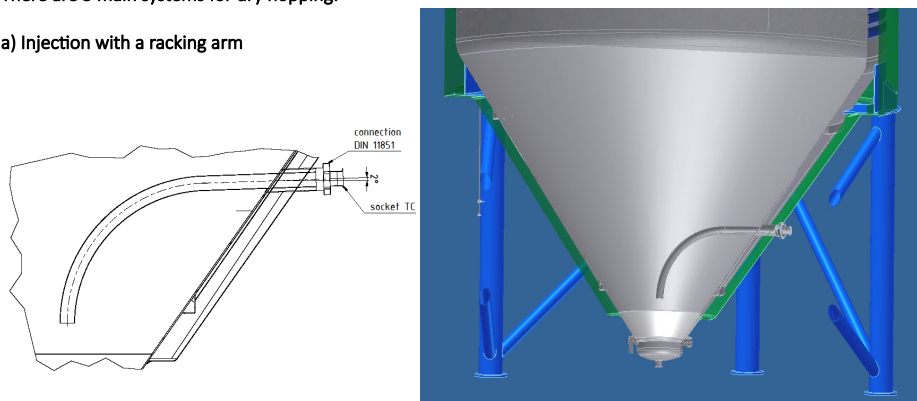
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### Dry hopping

Thesis 5: „(Almost) everything is possible, be creative!“

There are 3 main systems for dry hopping:

a) Injection with a racking arm



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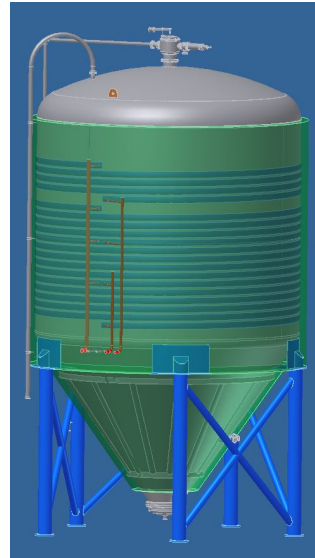
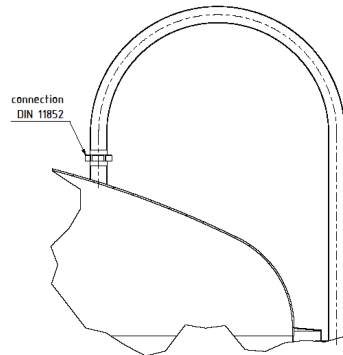
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### Dry Hopping

b) Pumping or blowing-in with a dry hopping line



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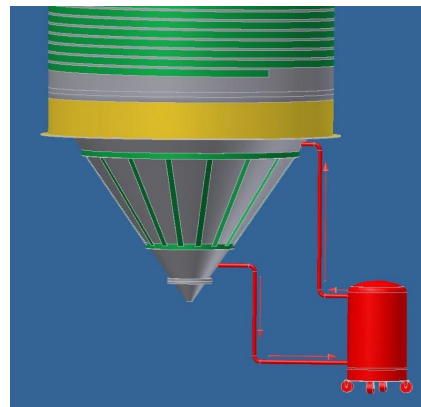
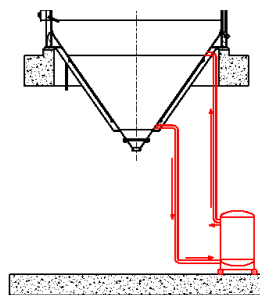
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### Dry Hopping

c) Circulation with a tank mixing system



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### Other Aspects and Details

Thesis 6: „The difference is in the detail“

Example: Tank top cover made of high-tech polyurethane



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### Other Aspects and Details

Do not forget about:

Tank insulation

Tank top fittings

Transport

Access to the tanks and tank tops

Main lines for glycol and others

Earthquake and wind security

Timing / delivery time



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### Summary

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- Thesis 2: „Tanks have to be tight, huge enough, and ...flexible!“
- Thesis 3: „Cleaning is too expensive!“
- Thesis 4: „Hygienic Design is the most effective cost savings program in the cellar!“
- Thesis 5: „(Almost) everything is possible, be creative!“
- Thesis 6: „The difference is in the detail!“



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Take care of flexibility  
Take care of the running costs  
Team up in time with the right partner

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Thank you for your attendance



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