

NANO CON 2020 EQUIPMENT TLC



OVERVIEW OF TOPICS

Equipment Care & Maintenance

- Intro / Josh & Topics
- PRO Chemical Selection
- Passivation
- Initial Equipment Prep
- Ongoing Equipment Cleaning
- Repairing Damage



INTRO

- **Josh Miller**
- **Learned about Brewing in Organic Chemistry while at Purdue**
- **Started Home Brewing in 2010**
- **Started brewing Professionally in 2014**
- **Earned 39 professional brewing medals between 2015 and 2019**



PRO CHEMICAL SELECTION

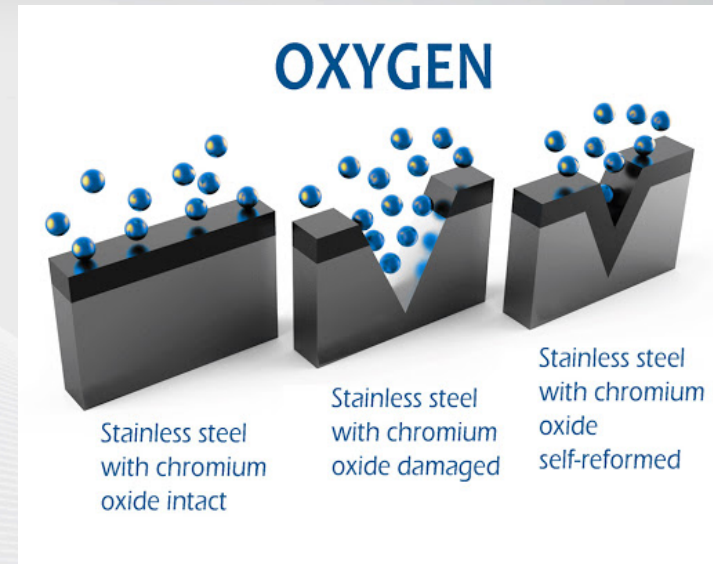
It's not just PBW and StarSan any longer!

- **Are PBW and StarSan Still OK?**
- **Caustic (use and cautions) Stay away from chlorinated versions or anything ending in "ine"**
- **Passivating – Nitric and Citric Acids**
- **Effectiveness, cost tradeoff**
- **Peracetic Acid (PAA) – use and cautions**
- **Buy from a supplier with good local support**
- **Compatibility with stainless, silicone, EPDM**
- **Safety**
- **Time/Temp/Agitation**



WHAT IS PASSIVATION?

- **What is stainless steel?**
- **304 18% Cr, 8% Ni, 0.08 C**
- **316 18% Cr, 12% Ni, 0.08 C, 2% Mo**
- **How does chromium work?**
- **Nitric and Citric Acid – removes contaminants and free iron**
- **You clean – the atmosphere passivates!**



OK, I HAVE MY GEAR - NOW WHAT?

- **Expect to clean and passivate all equipment to remove dust, polishing compounds, debris**
- **Brewhouse**
- **Fermentors and Bright tanks**
- **Pumps & hoses**
- **Plate chiller**



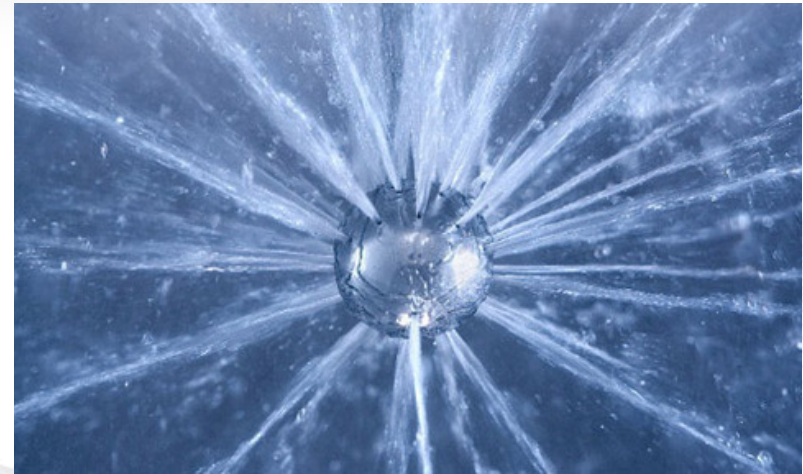
CONDENSED PASSIVATION SOP

- **PRE-WASH / WATER RECIRCULATION WITH WARM WATER – 10 min**
- **CAUSTIC RECIRCULATION – FOLLOW MANUFACTURE RECOMMENDATIONS**
- **WATER RINSE / RECIRCULATION – WARM WATER – 10 min**
- **PASSIVATION 5OZ ACID #5 PER GALLON OF WATER – around 125°F**
- **LET AIR DRY OVERNIGHT (MIN 12 HOURS)**
- **WATER RINSE / RECIRCULATION**
- **GET BREWIN'!**



FIRST TIME EQUIPMENT PREP

- CIP – what is it? why do I do it?
how do I do it?



GENERAL CIP SET UP



CIP SET UP



CLEANING REGIMENT

	Each Use	Weekly	Monthly	Yearly
Cellar tanks	Caustic / Acid / Sani	Monitor Temperature / leaks	Check all clamp points	Re-passivate
Mash tun	Rinse, remove false bottom	Caustic	Acid	Re-passivate
Boil kettle	Caustic / Acid	Scrub	Check all clamp points	Re-passivate
HLT	-	-	Acid CIP	Re-passivate
Hoses	Caustic / Acid / Sani			
Plate Chiller	Caustic / Acid / BACKFLUSH	-	-	Re-passivate
Heating Elements	Caustic / Scrub	Acid / Scrub	Check wiring	Re-passivate
Gaskets	Caustic / Acid / Sani soaks	-	Inspect	Replace



REPAIRING DAMAGE

- How did THAT happen!?
- Pits are normally from excessive contact with harsh chemicals, or the wrong chemical. Grind pit(s) and scrub with BKF, passivate tank to remove grinding debris.
- Rust specs – usually residual grinding dust. Scour with BKF
- Mechanical damage (scratches, dents) – grind if needed, scour with BKF. Passivate entire tank if grinding.



TIPS

- **Retighten clamps every month throughout your entire brewery**
- **Ensure you have pressure + vacuum relief valves. One kills your body, the other kills your wallet. Test annually.**
- **Glycol chillers, pumps, trench drains, RO system, wastewater, HVAC, etc.**



OPEN Q & A

**Equipment Care &
Maintenance**

