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890410 Tru Temp® Stainless BK-TT Mini-Blackening Kit
Operating Instructions

PRODUCT DESCRIPTION

Tru Temp® Stainless BK-TT Mini-Kit is a complete, 7-tank blackening line designed for smaller operations or to pilot the black oxide system before investing in a larger tank line system. The kit includes all the equipment and chemical products needed to achieve a professional black oxide finish on small stainless-steel parts.

The following components are included in the TruTemp® Stainless BK-TT Mini-Kit:

PART #	DESCRIPTION	QUANTITY
225500	▪ Steel Pail	3 ea
316100	▪ Lid for Steel Pail	3 ea
297302	▪ Plastic Pail w/Handle	4 ea
297402	▪ Lid for Plastic Pail	1 ea
225603	▪ Hotplates (110V/1100watt)	2 ea
870551	▪ Safe Scrub® ST Heavy Duty liquid cleaner	2 Gal
883050	▪ Muriatic Acid Surface Conditioner	2 Gal
622251	▪ TruTemp® Stainless black oxide	10 Gal
810451	▪ Dri-Touch® Amber IRP2 rust preventative	5 Gal
1630100	▪ 8" Stainless Steel Tank Thermometers	2 ea
1630300	▪ 8" Polypropylene Dipping Basket	1 ea

These instructions provide a starting point to running your Tru Temp Mini Kit system. Please find all individual instructions and SDS our website at:

<https://www.birchwoodtechnologies.com/resources/sds-instruction-sheets/>

Before using these products – Please read, understand, and follow all precautions shown on product labels and SDS'. Use appropriate Warning labels on any container used to store or apply these products. Please contact your Birchwood Technologies representative with any questions or concerns.

SETTING UP THE TANK LINE and MIXING CHEMICALS

Begin by attaching the appropriate tank label to each empty bucket, based on the bucket type listed on the chart. Each bucket has a maximum operating capacity of 4 gallons to prevent spills during use. To prepare 4-gallons of solution, first, add the specified volumes of each product shown on the chart, then fill to 4-gallons with water. When filled correctly, the liquid level will be 3.5 inches below the top lip of the bucket. Whenever possible, use deionized, RO, distilled, or filtered water when mixing and replenishing Tru Temp Stainless.

Tru Temp® Stainless Mixing Chart

Step	Process	Product	Bucket Type	Concentration	Mixing Volumes (gallons)
1	Alkaline Cleaner	Safe Scrub ST	Steel	20%	0.8 Gal Safe Scrub
2	Water Rinse	Fresh water rinse	Plastic	-	
3	Acid Conditioner	Muriatic Acid	Plastic	20%	0.8 Gal Muriatic Acid
4	Water Rinse	Fresh water rinse	Plastic	-	
5	Black Oxide	Tru Temp Stainless	Steel	100%	4 Gal Tru Temp Stainless
6	Water Rinse	Fresh water rinse	Plastic	-	
7	Rust Preventative	Dri Touch IRP2 Oil	Steel	100%	4 Gal Dri Touch IRP2

HEATING, and USING TRU TEMP® STAINLESS

Heat Safe Scrub ST to 150°F and Tru Temp Stainless to 200–210°F. Monitor temperatures closely and do not allow the solutions to boil. It typically takes about 45 minutes to reach 150°F and 60 minutes to reach 200°F when using the HIGH setting. Once the desired temperature is reached, turn the knobs to LOW/MEDIUM to maintain temperature.

Water will evaporate from the heated tanks. **WHEN LIQUID LEVEL IS LOW, REPLACE EVAPORATIVE LOSSES WITH FRESH WATER ONLY. CHEMICAL DOES NOT EVAPORATE!**

Parts can be placed in the polypropylene basket or suspended using steel wire or stainless steel hooks to carry them through the process. Be sure that steel wire is **not galvanized**, as zinc will dissolve and contaminate the bath. While steel or stainless steel baskets can be used, they may sometimes interfere with the blackening reaction. In all cases, hang or place parts away from the bottom and sides of the tank to ensure uniform coating.

Note: The surface condition of the part will significantly affect the final appearance of the black oxide finish. A polished part will result in a shiny black coating, while a media-blasted surface will produce a dull, matte black finish. Surface imperfections such as scratches, heat-treat marks, mill scale, or rust are not removed by the black oxide process and may remain visible on the finished part.

Tru Temp® Stainless Process

Step	Chemical	Temperature	Time	Notes
1	Safe Scrub ST	150-180°F	5-10 min	Complete cleaning is important for a uniform coating. Agitate parts if needed, to remove machining oils and grease.
2	Fresh water rinse	Room Temp	1 min	Thoroughly rinse cleaner residue off parts
3	Muriatic Acid	Room Temp	5-20 min	Activate parts for blackening with acid conditioner. Agitate if needed
4	Fresh water rinse	Room Temp	1 min	Thoroughly rinse muriatic acid residue off parts
5	Tru Temp Stainless	200-210°F	30-60 min	Submerge away from bottom and sides of bucket. Agitate to reduce contact points between parts and allow complete conversion coating. 303 blackens faster, 400 series takes longer, and 316 takes longest.
6	Fresh water rinse	Room Temp	1-2 min	Thoroughly rinse caustic residue off parts. Agitate to rinse holes and corners. Rinse water must be replaced often to maintain a clean rinse tank
7	Dri Touch Oil	Room Temp	1-2 min	Water-displacing oil removes moisture and adds a layer of protection against corrosion. Agitate parts to ensure all water is removed from tight spaces. Allow to drain and dry 1-2 hrs

Once dry, that's it! The parts are now ready to be used, assembled or packaged!

All the solutions in the line are stable when stored properly. Cover the four chemical tanks between uses to keep dust and dirt out of the chemical solutions. It is suggested to dump and refill each rinse tank with fresh water, OFTEN – usually every 10 – 30 square feet of parts processed. This helps prevent contamination of chemical solutions with carry-over from previous tanks.

LINE MAINTENANCE

Water evaporates from the heated tanks. **REFILL TO OPERATING LEVEL WITH FRESH WATER ONLY. DO NOT REPLENISH LOST VOLUME WITH CHEMICAL CONCENTRATE.** Running at high chemical concentrations will hurt the quality of the black coating.

It is sometimes necessary to make **small** additions to replace lost chemicals and to boost performance. **After each month of moderate use, if needed, add 4-8 Fl Oz (100-200mL) of Tru Temp 2nd Gen concentrate.** Larger additions will not achieve better coatings. This addition replaces the small amount of chemical dragged out with normal use. Additions to all other chemicals are not necessary unless specific issues arise.

Tru Temp working bath life depends on many factors like use, contamination level, and types of parts run through the system. **If the coating becomes light or inconsistent, check with the troubleshooting guide on the next page.** If the bath has been used for multiple months already, it may be time to swap with fresh chemistry. A typical bath life is 3-6 months of moderate use. The included chemistry is enough for small additions and to re-make all baths.

DISPOSAL

All solutions must be treated as hazardous waste unless neutralized to pH 8-10. Share the SDS' with your local wastewater treatment facility to see if they will accept neutralized mineral acids and bases with your facility's other wastewater. Use an acid like PN 611651 Tru Temp Neutralizer to bring the pH to a neutral level before dumping. Email metalfin@birchwoodtechnologies.com for the neutralization procedure. A chemical waste service provider should be used to dispose of non-neutralized baths.

TROUBLESHOOTING GUIDELINES

PROBLEMS/OBSERVATIONS	PROBABLE CAUSES	CORRECTIVE MEASURES
Spotty finish or mottled appearance Oil slick on surface of Safe Scrub ST Oil slick on surface of other baths	Incomplete cleaning Burnt-on coolants or machining oils Oil causing contamination in baths Inconsistent surface condition	Increase Safe Scrub ST temperature to 180°F. Longer cleaning time. Agitate parts. Add Safe Scrub concentrate. Remove oil from surface. Make sure parts are clean before next step. Swap Safe Scrub.
Prolonged blackening time	Low Muriatic Acid concentration Difficult alloy Difficult surface condition	Increase concentration and/or immersion time of muriatic acid. Polished parts take longer to blacken. Media blast or other surface prep.
Brown Coating	TruTemp® bath temperature or concentration is low; Muriatic acid is old or weak, or insufficient immersion times	Stir Tru Temp bath and check temperature. Increase Tru Temp immersion time or concentration. Increase muriatic acid concentration or immersion time
Inconsistent results. Some parts blacken others don't.	Galvanic interactions between parts and tank. Overloaded tank. Inconsistent temperatures.	Do not use steel or stainless basket, use insulated polypropylene basket or hang parts away from sides and bottom of tank. Check Temps.
Little or no black coating development throughout	Poor cleaning; insufficient surface activation. TruTemp® temperature too low. Tank chemicals may be low or contaminated through drag-in of previous chemicals.	Improve cleaning, check temperatures, longer immersion times, check concentrations. If contaminated or fully used, swap with fresh chemistry.

Problems? Call our Technical Support Chemists at 952-937-7945

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