



Metal Finishing Systems

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## **TRU TEMP® BK-TT Mini-Blackening Kit**

### **Operating Instructions**

#### **PRODUCT DESCRIPTION**

The TRU TEMP® BK-TT Mini-Kit is a complete 7-tank blackening line designed for tool room scale black oxidizing of iron and steel components. The BK-TT Mini-Kit utilizes the TRU-TEMP® low-temperature black oxide process and includes all the equipment and chemical products needed to blacken iron or non-stainless steel on a 5-gallon scale.

The BK-TT Mini-Kit includes the following components:

- 3 steel pails and lids
- 4 plastic tubs and 1 plastic lid
- 2 hotplates (110V, 1100 watt)
- 5 gallons SAFE SCRUB® ST biodegradable liquid cleaner
- 10 pounds OXYPRIME® POWDER surface conditioner
- 5 gallons TRU-TEMP® XL black oxide concentrate
- 5 gallons DRI-TOUCH® AMBER IRP2 rust preventive
- Complete instructions, tank labels and Material Safety Data Sheets for all products

#### **SETTING UP THE TANK LINE and MIXING THE CHEMICALS**

Begin by attaching the enclosed tank labels to the empty tanks. Then, fill each tank, as described below:

- Tank 1** Steel Cleaning Tank. Attach SAFE SCRUB label. Then, mix ½ gallon SAFE SCRUB® liquid cleaner into 4.5 gallons of tap water. Set the tub on top of the first hotplate. Heat to 150°F.
- Tank 2** Plastic Rinse Tank. Attach RINSE label. Then, fill with cold tap water.
- Tank 3** Plastic Surface Conditioning Tank. Attach OXYPRIME label. Then, mix 5 pounds of OXYPRIME® POWDER surface conditioner into 5 gallons of tap water. Stir to dissolve.
- Tank 4** Plastic Rinse Tank. Attach RINSE label. Then, fill with cold tap water.
- Tank 5** Steel Blackening Tank. Attach TRU TEMP label. Then, mix 2.5 gallons TRU-TEMP® XL blackening concentrate into 2.5 gallons of cold tap water. Set the tank on top of the second hotplate and warm to 200-205°F.
- Tank 6** Plastic Rinse Tank. Attach RINSE label. Then, fill with cold tap water.
- Tank 7** Steel Oil Tank. Attach DRI TOUCH label. Then, fill with DRI-TOUCH® IRP2.

Normal tank heat-up time is 30-45 minutes. Once heated, the tank line is ready for blackening.

***Before Using These Products – Please Read, Understand and Follow all the Precautions shown on the Product Labels and on the Material Safety Data Sheets.***

The Material Safety Data Sheets can be found on our website: [www.birchwoodcasey.com](http://www.birchwoodcasey.com)

### **PROCESSING PARTS through the TRU TEMP LINE**

Most parts can be carried on steel wires. Very small parts can be processed in bulk by carrying them in a plastic colander or mesh basket. Mild agitation during each immersion is helpful. Rusty or scaly parts should be bead blasted first. Then, use the following sequence:

- Step 1        CLEAN in Tank 1. Immerse parts for 5 minutes at 150°F.
- Step 2        RINSE in Tank 2 for 20 seconds.
- Step 3        CONDITION SURFACE in Tank 3. Immerse for 5-10 minutes at room temperature.
- Step 4        RINSE in Tank 4 for 20 seconds.
- Step 5        BLACKEN in Tank 5 for 10-15 minutes, or until parts are a uniform black.
- Step 6        RINSE in Tank 6 for 20 seconds.
- Step 7        SEAL in Tank 7. While still wet from the rinse, immerse in sealant for 1 minute. Remove parts and allow to drain and dry.

That's it! The parts are now ready to be assembled or packaged.

All the solutions in the line are completely stable in storage and will not deteriorate except through blackening. Cover the four chemical tanks between uses to keep dust and dirt out of the solutions. Also, it is a good idea to dump and re-fill each RINSE tank with fresh water OFTEN -- usually every 10-30 square feet of parts processed -- in order to prevent contamination of chemical solutions by residues carried in from previous tanks.

### **LINE MAINTENANCE**

As parts are processed, the SAFE SCRUB, OXYPRIME and TRU TEMP solutions will gradually weaken and work more slowly. Once this becomes noticeable, the solutions can be strengthened by replenishing with fresh concentrate. Add about 1/3 the amount used to originally mix the tank. Or, test the solutions by using the GO/NOGO TEST KIT, available from BIRCHWOOD CASEY. As the solutions age and become saturated with oil or iron, they should be replaced with fresh solutions – about every 4-6 months, under normal workload conditions.

The BK-TT Kit chemicals should be sufficient to operate the process line for 4-6 months and will cover 2000-3000 square feet of surface area. Replacement chemical products can be purchased, as needed, from BIRCHWOOD CASEY. Please see the enclosed price list.

Thanks for your interest in BIRCHWOOD CASEY products! Please feel free to call us at 952-937-7931 if there are questions.

### **BK-TT HELPFUL HINTS**

Tank #1 – SAFE SCRUB® ST  
150°F 5 minute soak

- As water evaporates, add tap water to maintain level.
- When floating oil slick is observed, skim off oil and add 1-2 quarts of SAFE SCRUB® concentrate.
- Check for water breaks on part after rinsing in tank 2. If water breaks occur, your cleaning is inadequate. Add SAFE SCRUB® concentrate, or increase time and temperature.
- Replace SAFE SCRUB® solution after 4 additions of fresh concentrate.
- Unplug hotplate when idle. Leave rheostat knob set at operating setting.

Tank # 2, 4, 6 – RINSES  
20 second immersion

- Dump and refill with fresh water when the water becomes cloudy – about every 30 square feet of work processed.

Tank #3 - OXYPRIME® POWDER  
Room temperature.  
5-10 minute immersion.

- Parts may sizzle slightly as the solution works.
- When reaction slows, add 1 pound of OXYPRIME® POWDER concentrate. Replace bath after 4 additions of fresh powder.

Tank #5 – TRU-TEMP® XL  
200-205°F.  
10-15 minute immersion.

- As water evaporates, add tap water to maintain level. Replenish as indicated by GO/NOGO Test Kit. Unplug hotplate when idle. Leave rheostat knob set at operating setting.
- When reaction slows, add 2 quarts TRU-TEMP® XL concentrate.

Tank #7 – DRI-TOUCH® IRP2  
Room temperature.  
1 minute immersion.

- This product is a water-displacer. Dip parts while still wet from the rinse. The water will drop to the bottom of the tank, and should be removed periodically siphon hose.
- Allow parts to hang and dry after dipping.
- Add DRI-TOUCH IRP2 to maintain the level.

Most users find that parts fall into three general categories:

Category 1: Cast iron, low-carbon steels are quite active and blacken easily with relatively short immersion times – 5 minutes in OXYPRIME; 10 minutes in TRU TEMP.

Category 2: Medium-carbon, heat-treatable grades of steel are less reactive and require longer immersion times – 8-10 minutes in OXYPRIME and 10-12 minutes in TRU TEMP.

Category 3: High-speed steels are the least reactive and require even longer immersion times – 10-15 minutes in OXYPRIME (or a 2 lb/gallon mix ratio) and 15 minutes in TRU TEMP.

Note: Parts can usually soak for long periods in tanks 1, 5 and 7 without any ill-effects. Rinse tank times should be at least 10 seconds and no more than 2 minutes or so. The OXYPRIME tank should be a timed operation, as described above, in order to optimize the quality of the black finish.

Remember, cleaning the parts is the most important step. Keep the rinse tanks clean, as well. Good maintenance practices make for consistently good black oxide results.

**TRU TEMP®  
TROUBLESHOOTING  
GUIDELINES**

<u>Problem/Observation</u>	<u>Probable Causes</u>	<u>Corrective Measures</u>
Non-blackened areas or mottled appearance	Incomplete cleaning; OXYPRIME concentration too low or insufficient contact time; TRU TEMP concentration too low	Agitate parts. Longer cleaning time. Make sure parts are water-break free in Rinse 2. Re-process parts, starting at Tank 1, but with longer times. Severe cases: bead blast parts.
Prolonged blackening time	Insufficient OXYPRIME coating development. OXYPRIME or TRU TEMP concentrations too low.	Replenish baths as necessary or increase contact time in OXYPRIME.
Sooty black coating	Excessive immersion time in OXYPRIME.	Try reducing OXYPRIME immersion times by 1 minute increments to zero in on best time.
Brown coating	TRU TEMP bath temperature too low. OXYPRIME bath too old, too weak or insufficient immersion times.	Adjust bath parameters accordingly. For older baths: OXYPRIME -dump and recharge with fresh product; TRU TEMP – make product addition or raise temperature
Flash rusting	Entrapped water in rust preventive. Excessive immersion times in rinse tanks.	Drain water from oil tank, then top up with DRI TOUCH. Agitate parts to drive water out. Rinse parts for 20 seconds.
Little or no black coating development throughout	Poor cleaning; insufficient surface activation. TRU TEMP temperature too low. Baths may be contaminated through drag-in or previous chemical.	Add cleaner; consider acid pickling prior to OXYPRIME. Raise TRU TEMP temperature to 200-205°F. Replace contaminated baths as necessary.

Questions? Problems? Please call our factory at 952/937 7931.  
Or, call your local BIRCHWOOD CASEY representative for assistance.

TRU TEMP® BK-TT Mini- KIT  
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