



Birchwood Laboratories LLC  
7900 Fuller Road  
Eden Prairie, MN 55344  
TEL: (952) 937 – 7931  
FAX: (952) 937 – 7979  
www.birchwoodtechnologies.com

**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 black oxidizing of iron and steel substrates on tool room scale. The BK-TT Mini-Kit utilizes the Tru Temp® low-temperature black oxide process and includes all necessary equipment and chemical products needed to black all iron and non-stainless steel substrates, on a 5 – gallon scale.

The following components are included in the Tru Temp® BK-TT Mini-Kit:

<b>PART #</b>	<b>DESCRIPTION</b>	<b>QUANTITY</b>
225500	▪ Steel Pail	3
316100	▪ Lid for Steel Pail	3
297302	▪ Plastic Pail w/Handle	4
297402	▪ Lid for Plastic Pail	1
225603	▪ Hotplates (110V/1100watt)	2
870551	▪ 5 gallon pail Safe Scrub® ST biodegradable liquid cleaner	1
881050	▪ 1 gallon Oxyprime® XPL Heavy Duty Liquid	2
611351	▪ 5 gallon pail Tru Temp® XL black oxide concentrate	1
810451	▪ 5 gallon pail Dri-Touch® Amber IRP2 rust preventative	1

Complete Instructions, tank labels, and Safety Data Sheets (SDS') for all products. Should any instructions or SDS' be missing, you can find them on our website at:

<https://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. If there are questions or concerns don't hesitate to contact your Birchwood Technologies representative.**

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

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

<b><u>Tank #</u></b>	
1	Steel pail – Attach Safe Scrub® ST label. Mix ½ gallon Safe Scrub® ST liquid with 4 ½ gallons of tap water. Mix well. Set tank on top of a hot plate. Heat to 140° – 150°F.
2	Plastic pail – Attach Rinse tank label. Then fill cold tap water.
3	Plastic pail – Attach Oxyprime® XPL label. Mix 1 gallon of Oxyprime® XPL Heavy Duty Liquid with 4 gallons of tap water. Mix well.
4	Plastic pail – Attach Rinse tank label. Then fill cold tap water.
5	Steel pail – Attach Tru Temp® XL label. Mix 2 ½ gallons of Tru Temp® XL blackening concentrate with 2 ½ gallons of cold tap water. Mix well. Set tank on top of a hotplate. Heat to 190° – 210°F.
6	Plastic pail – Attach Rinse tank label. Then fill cold tap water.
7	Steel pail – Attach Dri-Touch® Amber IRP2 label. Fill with Dri-Touch® Amber IRP2.

Normal tank heat up time is approximately 30 – 45 minutes. Once tanked have reached recommended temperatures, the tank line is ready for blackening.

## **TRU TEMP® TANK LINE PROCESSING RECOMMENDATIONS**

Most parts can be carried on steel wires. Very small parts can be processed in bulk by using a plastic colander, or mesh basket to carry them. Mild agitation during each immersion can be helpful during processing. Rusty or scaly parts should be bead blasted first.

Standard steps taken to achieve blackened parts:

<b><u>Steps</u></b>	<b><u>Description</u></b>
1	Cleaning part – Immerse part/s for 5 – 10 minutes at 140 – 150°F.
2	Rinsing Part – Immerse part/s for 30 – 60 seconds.
3	Primer/Conditioning (Oxyprime) – Immerse part/s for 2 – 10 minutes at room temperature.
4	Rinsing Part – Immerse part/s for 30 – 60 seconds.
5	Blackening Part – Immerse part/s for 5 – 15 minutes, or until the parts are uniform black at 190° – 210°F.
6	Rinsing Part – Immerse part/s for 30 – 60 seconds.
7	Sealant/Rust Preventative – While part/s are still wet, immerse part/s for 60 seconds. When parts are removed, allow to drain and dry.

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

All the solutions in the line are completely stable when stored properly. They will not deteriorate except when used in the blackening reaction. Cover the four chemicals tanks between uses to keep dust and dirt out of the chemical solutions. Also, 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**

As parts are processed, the Safe Scrub® ST, Oxyprime® XPL, and Tru Temp® XL solutions will gradually weaken and work more slowly. Once this becomes noticeable, the solutions can be strengthened by replenishing with fresh concentrate. Add approximately a third (1/3) of the amount used to originally mix the tank. The use of the Go/NoGo Test Kit (PN 891503), available from Birchwood Technologies®, can also be used to test the solutions. These chemicals operate best when smaller, more consistent replenishment additions are added instead of large quantities less often, to maintain chemical balance. As the solutions age and become more saturated with oil or iron, they should be replaced with fresh solutions. This should take place about every 3 – 6 months, under normal workload conditions.

REMEMBER, cleaning the parts is the most important step. Keep the rinse tanks clean by changing out the water, regularly. Good maintenance practices make for longevity of chemical tanks, as well as consistent, quality black oxide results.

The BK-TT Mini Kit chemicals should be sufficient to operate the process line for 3 – 6 months and will cover approximately 2000 – 3000 square feet of surface area. Replacement chemicals can be purchased, as needed, from Birchwood Technologies®. Please see enclosed price list for further details.

Thank you for your interest in Birchwood Technologies® products! Please feel free to call us at any time if you have questions, or if we can be of further assistance, at 1-800-328-6156.

## **BK-TT HELPFUL HINTS**

Tank 1 – Safe Scrub® ST  
140° – 150°F (5 – 10 min. immersion)

- As water evaporates, add tap water to maintain level
- When floating oil slick is observed, skim oil off and add 1 – 2 quarts of Safe Scrub® ST concentrate
- Check for water breaks on parts after immersing in Tank 2. If water breaks do occur, your cleaning was inadequate. Increase concentration of cleaning chemical, or increase time of immersion.

Tank 2, 4, 6 – Rinses  
(30 – 60 second immersion)

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

Tank 3 – Oxyprime® XPL  
Room Temp. ( 2 – 10 min. immersion)

- Part may out gas slightly as the solution works.
- When reaction slows, add ¼ gallon Oxyprime® XPL concentrate. Replace bath after eight (8) additions of fresh chemical.

Tank 5 – Tru Temp® XL  
190° – 210°F ( 5 – 15 min. immersion)

- As water evaporates, add tap water to maintain level. Replenish as indicated by Go/NoGo Test Kit. Unplug hotplate when idle. Use rheostat to maintain operating settings.
- When the reaction slows, add two (2) quarts of Tru Temp® XL concentrate.

Tank 7 – Dri-Touch® Amber IRP2  
Room Temp. (60 sec. immersion)

- This product is a water displacing oil. Dip parts while still wet from the rinse. The water will shed off the bottom of the parts, and drop to the bottom of the tank. The water should be removed periodically with siphon hose.
- Allow parts to hang and dry after dipping.
- Add Dri-Touch® Amber IRP2 to maintain 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® XPL, 10 minutes in Tru Temp® XL).

Category 2: Medium-carbon, heat treated grades of steel are less reactive and require longer immersion times (8 – 10 minutes in Oxyprime® XPL, 10 – 12 minutes in Tru Temp® XL).

Category 3: High speed steels, the least reactive, require even longer immersions (10 – 15 minutes in Oxyprime® XPL and 15 minutes in Tru Temp® XL).

**NOTE:** Parts can usually soak for long periods of time in tanks 1, 5, and 7 without any ill effects. Rinse times should be at least ten (10) seconds, but no more than two (2) minutes. The Oxyprime® tank should be a monitored, timed operation, as described above, in order to optimize the quality of the black coating.

**TRU TEMP® XL  
TROUBLESHOOTING GUIDELINES**

<b>PROBLEMS/OBSERVATIONS</b>	<b>PROBABLE CAUSES</b>	<b>CORRECTIVE MEASURES</b>
Non-blackened areas or mottled appearance	Incomplete cleaning; Oxyprime® concentration is below recommended concentration or insufficient contact time; Tru Temp® concentration is below recommended concentration	Agitate parts. Longer cleaning time. Make sure parts are ‘water break free’ in Rinse #2. Reprocess part/s, starting in Tank 1, but longer immersion times. Severe cases – bead blast part/s.
Prolonged blackening time	Insufficient Oxyprime® coating development. Oxyprime® concentration is below recommended concentration or insufficient contact time; Tru Temp® concentration is below recommended concentration	Increase immersion time in Oxyprime®. Replenish chemicals as necessary.
Sooty Black Coating (“smutty”)	Excessive immersion time in Oxyprime®	Try reducing Oxyprime® immersion time by one (1) minute increments to zero in on the best time.
Brown Coating	Tru Temp® bath temperature is outside recommended parameters; Oxyprime® chemical is old or weak, or insufficient immersion times	Tru Temp® – adjust temperature so that it is within recommended parameters. Some parts are “heat sinks” and temperature should be ran closer to 210°F. Oxyprime® – dump and recharge with fresh chemical; or change immersion times.
Flash Rusting	Entrapped water in rust preventative. Excessive immersion times in rinse tanks.	Drain water from rust preventative/sealant tank. Agitate parts to drive water off. Rinse parts for 20 seconds.
Little or no black coating development throughout	Poor cleaning; insufficient surface activation. Tru Temp® temperature too low. Tank chemicals may be contaminated through drag-in or previous chemicals.	Add cleaner or longer immersion time in cleaner; consider acid pickling prior to Oxyprime®; Raise temperature of Tru Temp® to 205° – 210°F

**Questions? Problems? Please call our facility at 1-800-328-6156  
Or, call your local Birchwood Technologies® representatives for assistance.**