

Peroxide Hot Fire Test Procedures

Test Date _____ May 26, 2016 _____

Test Information

- Assign checklist/clipboard person
- Prepare water bath
- Fill eye wash station with water
- Personnel near peroxide must wear proper PPE
 - Face-mask and BB suit
- Ensure the ultravolt switch is in the OFF position
- Turn on 115V power supply
- Turn on test cell lights
- Ensure motor is properly installed and secured to test stand
- Plug in cart and turn on instrumentation box
- Connect USB cable from test stand to cart
- Remove tools from Peroxide cart and place in toolbox
- Connect heater to remote switch
- Verify remote heater switch is in the off position
- Connect heater power
- Setup camera

Pre-Test checks

- Fill dump bucket halfway
- Check that dump line is secure
- Ensure that dump bucket lid is in place, and that dump line passes through lid and is secured
- Ensure USB connection is good between laptop and test stand
- Open CO2 bottle
- Ensure CO2 output pressure is about 100psi
- Start the VI
- Set thermocouple reference junction (Test cell temp 15C)
- Cycle SV1, SV2 and SV3
- Cycle PAS1 and PAS2 valves to ensure proper operation
- Turn on High Voltage switch

- Run spark from test computer and verify spark data looks nominal
- Turn off High Voltage Switch
- Verify thermocouples work
- Laptop user ensures pressures and all other readings look nominal
- Laptop user verifies that both solenoid valves are closed
- Verify the manual vent valves are closed
- Evacuate all non-essential personnel from test cell
- Shut and lock test cell

Fill Procedures

- Ensure MV01 is closed
- Ensure MV02 is closed
- Pour ~200 mL peroxide into the 250 mL graduated cylinder
- Record volume and mass
 - Volume 223mL
 - Mass 301g
 - Concentration 82.7202% (@23.3C)
- Open MV03
- Open MV04
- Pour all peroxide into graduated cylinder
- Record amount of peroxide 576mL
- Place funnel in MV04
- Pour peroxide through funnel into tank
 - VI operator monitors Temp and Pressure
 - If anomaly, open PAS01
- Take funnel and graduated cylinders to water bath and rinse thoroughly
- Close MV03
- Pulse PAS2 valve briefly
- Close MV04
- Slowly open the Nitrogen tank
- Adjust regulator to desired top pressure (~275)
- Record top pressure psi 275(gauge) psi 274 (VI)
- Open GOX tank
- Set heater to desired temperature
- Start camera
- Spray forward test cell with water
- Turn on High voltage switch
- Evacuate all personnel from test cell, and ensure all test cell doors are closed
- Pulse the Nitrogen pressure valve to pressurize the peroxide run tank

- Observe cart during pressurization to ensure that there are no leaks
 - If leak is detected, open PAS 1

Test procedure

- Ask for silence in the control room from all personnel
- Turn on test cell fan
- Restart VI and assign proper filenames
- Set VI test run time 4 seconds
- Give a 5-second countdown and initiate test
- After test is complete, stop running test in VI
- Save data as desired filename

***Optional**

- Start heater, Let heater reach desired temp
- Set VI test run time 2 seconds
- Give a 5-second countdown and initiate test
- Save data as desired filename
- Repeat until peroxide is exhausted

Post Test

- Dump excess peroxide by opening and PAS1 from the VI
- Open PAS1 then SV3 to vent remaining pressure
- Open SV2 for 3 seconds
- Give the group 2 minutes to celebrate your successful test before entering the test cell.
Personnel must wear face shields and other PPE when entering the test cell
- Stop Camera
- Start again from * if testing is to resume

Flush Procedures

- Ensure MV01 is closed
- Ensure MV02 is closed
- Open MV03
- Open MV04
- Place funnel in MV04
- Pour ~500 mL DI water through funnel into tank
- Pulse the SV1 (Nitrogen pressure valve) to pressurize the peroxide run tank
- Open SV1 and PAS2 for 8 seconds
- Open SV3 then PAS1 to dump excess water and depressurize
- Close Nitrogen bottle
- Vent nitrogen line from one of the two manual vent valves

- **Vent pressure from nitrogen line by turning the regulator counter clockwise until ambient pressure is achieved
- Close CO2 bottle

In the case that an individual gets peroxide in his/her eyes

- Assist the individual to the eye wash station
- Pull down on the marked hatch
- Bend over so that the individual's eyes are in the water stream

In case of spill

- Move personnel and flammable objects away from spill
- Affected personnel should immediately rinse PPE that was exposed to peroxide
- Drench spill with water