

 Title: Oil sampling from a sealed transformer using Trans-Sample non-return coupling		Procedure No: TrS 000
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Purpose

This procedure highlights the need to ensure precautions are taken when removing oil from transformers for the purpose of dissolved gas analysis when using the Non-Return Trans-Sample coupling

Health & Safety

General caution, health, safety and environmental protection.

This procedure does not purport to address all the safety problems associated with its use. It is the responsibility of the user of the standard to use appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

The mineral insulating oils which are the subject of this procedure should be handled with due regard to personal hygiene. Direct contact with the eyes may cause irritation. In the case of eye contact, irrigation with copious quantities of clean running water should be carried out and medical advice sought.

Procedure

Identifying free breathing transformers

- a. Identify if the transformer or device is sealed – i.e. no breather.
- b. Ensure the transformer or device has a Non-Return Trans-Sample fitted. See images at the end of this document to confirm.
- c. Remove the dust cap from the Non Return Trans-Sample (NRTS) coupling. If necessary, wipe down and ensure connection area is clean. Do not use solvents – these may contain a hydrocarbon.
- d. Place drip tray beneath the valve and NRTS assembly, open the valve on transformer side of NRTS coupling. Check for leaks. Do not tighten – inform supervisor if leaks exist.
- e. Place the vent end of the sampling tube in waste bucket.
- f. Push the top sleeve of the coupling back to the acceptance point, connect the sampling tube to the NRTS in one solid motion. Oil **must** flow away from the transformer. If this does not happen, the transformer or device is under vacuum and cannot be sampled. Try when the transformer is under load and at higher temperatures or contact Trans Sample for advice on their vacuum pump system for oil sampling.
- g. Allow oil to flow until approx. 3 times the volume of the NRTS and the TX valve assembly, ensuring any stagnant oil has been flushed. Note – flushing when using a NRTS is not for “cleaning of the fittings” as with legacy sampling methods.

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- h. Open new clean glass sampling bottle ensuring no pollutant enters bottle or contacts inside of lid. The use of plastic bottles is not recommended. Insert sampling tube into the bottle.
- i. Allow 50-100ml of oil to enter the bottle. Cap bottle, swish the oil in bottle to clean inside of bottle. Empty and repeat. Bottle must be cleaned two times.
- j. Wipe down sampling tube with clean cloth. Place tube into bottle to the very bottom of the bottle.
- k. Fill the first bottle¹ in one motion to overflowing². Remove tube carefully from bottle. Cap and seal the bottle. No allowance is required for oil expansion in the bottle other than the small space left after tube is removed if quality bottles and caps are supplied by your laboratory.
- l. Repeat the previous step with the second bottle, however this time, using a thermometer to measure the inflow oil temperature at the closest point to the NRTS and record.
- m. Attach a 50ml glass syringe to the sampling tube using the fitted Leur Lock device and start the oil flow into the waste bucket through the stopcock in the bypass position. This flow should be slow and steady.
- n. Rotate the stopcock away from bypass and allow the oil to enter the syringe. Do not pull the syringe plunger. Watch carefully for bubbles forming around plunger lead edge. Rotate the plunger clockwise and anti-clockwise 360° to ensure seal. Tilt syringe to 60° stopcock up, and allow the syringe to fill at a rate of no faster than 1ml per second.
- o. Overfill the syringe to around 60ml and keeping the syringe tilted, close stopcock to bypass and close small ball valve. Disconnect the Leur-Lock and rotate syringe to vertical.
- p. Carefully open stopcock back to sample position making sure the plunger is firmly held and slowly expel any air bubbles in syringe. This is easiest done by using a screwing motion on the plunger. When complete, re-stow and ensure and ensure no direct sunlight reaches the syringe.
- q. Remove the sampling tube from the NRTS – be prepared for a little oil to drip out during this process. Do not close the main transformer valve until the tube has been removed to always ensure oil integrity of the device.
- r. Clean down area. Replace dust cap on the NRTS

¹ If bottle has been previously opened or it is suspected the bottle may be contaminated, and no other new bottles are available, fill the bottle to approx. 1/8th full and use this oil to swish around the bottle to clean. Ensure cap is included in cleaning.

² Oil in flow temperature must be recorded using laser temperature device. If not conducting thermography on TX, also record the TOT as well as Top Tank Temperature



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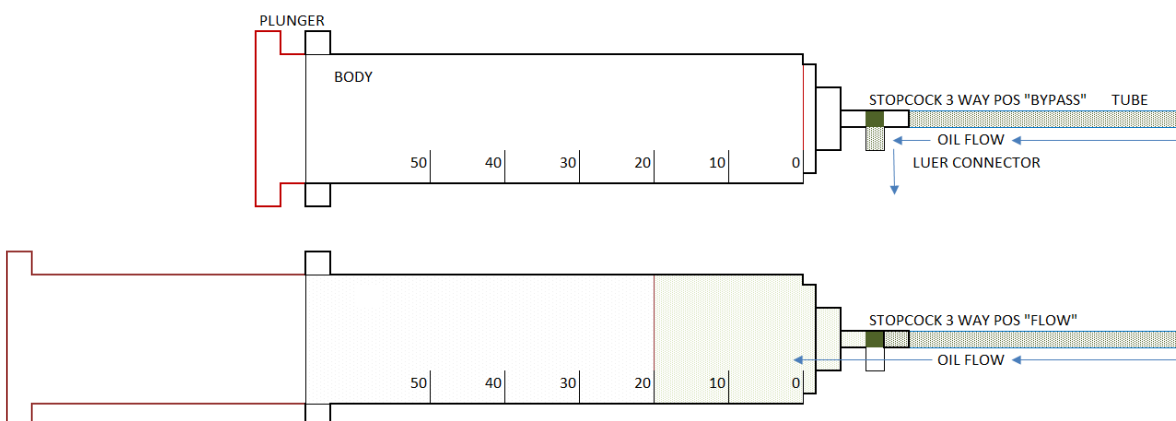
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Trans Sample recommends new sample tubes on every critical sample, and never use the same tube between OLTC and TX.



NRTS



TS