



INSULATING MINERAL OIL SAMPLING PROCEDURE

1. OBJECTIVE

Set a sampling procedure for insulating mineral oil, to be used in electrical equipments.

2. FIELD OF APPLICATION

It applied to the sampling of insulating mineral oil collected by the client or Lorencini Serviços for tests defined in the Norm, at Lorencini's Laboratory.

3. RESPONSIBILITIES

3.1 Clients

Take the oil collection flasks and syringes at Lorencini's Laboratory, perform the sampling following the work instructions and deliver the recipients in the laboratory of Lorencini Serviços. The materials borrowed from Lorencini must be returned in perfect conditions. If it is lost or broken, the Client must reconstitute them according to the amount previously defined in the service supply invoice. (Client Obligations field).

3.2 Lorencini's Collection Team

They will take the flasks and syringes at the Laboratory, proceeding the sampling according to the work instructions and deliver the oil samples returning them to the laboratory.

3.3 Laboratory

Provide the flasks and syringes in perfect conditions and clean for use to external clients or collection team.

Receive the insulating oil samples, checking date and identification notes, storing them properly, in order to not absorb humidity neither loss their identification. Register the samples in the system and check if there is any prior history. Perform tests according to the work instructions. Record test results in the system and emit the Test Report of insulating mineral oil. Empty, clean and store the recipients for a new sampling.

4. REGISTERS

The test results are registered in the Test Reports system of Insulating mineral oil.

5. SAMPLING

5.1 Taking the sample of insulating oil from electric equipments

5.1.1 Sample for physical-chemical tests

The sampling must be collected, preferably, in the faucets of electric equipments. When it is not possible, the sample can be taken through an inspection cap, by using pipettes, hoses or syringes.

During the sampling, the following procedures must be observed:

- Clean the oil removal faucet;
- Connect the proper sampling device in the equipment's faucet;
- Put a contention plate or any other material that avoids the oil leakage in the soil;
- Open the faucet slowly and let a bit of useless oil without come out;
- Use a 1 liter glass flask with screwed cap. It must be clean and completely dry;
- Let approximately 200ml flow into the flask, close the faucet and with rotary movements, rinse the flask with oil;
- Dispose the oil;
- Open the faucet again and fill the flask up its overflow. Close the flask and the faucet immediately;
- Clean the flask carefully;
- When the faucet has a tampon, pass the threadlocker before connecting it again;
- Make sure that the faucet is closed properly and there is no leakage;
- Identify the sample correctly;
- Store the flask in a dark place till sending it to the laboratory.

5.1.2 Sample for chromatographic tests

The samples must be collected, preferably, in the faucets of electric equipments. When it is not possible, the sample can be taken through the inspection cap, by using syringes.

During the sampling, the following procedures must be observed:

- Clean the oil removal faucet;

- Connect the proper sampling device to the equipment's faucet;
- Put a contention plate or any other material that avoids the oil leakage in the soil;
- Open the faucet slowly and let a bit of useless oil come out;
- Use a clean and dry syringe with a volumetric capacity of at least 20ml;
- Connect the three way cock to the sampling device and then, open the faucet in order to let the oil penetrating slowly into the syringe. The piston may not be pulled, but can be retracted under pressure of the oil column;
- Dispose the oil;
- Repeat the syringe filling operation with a volume higher than that measured in it;
- Close the three way cock and, then, the sampling valve;
- Disconnect the syringe with the three way cock of the sampling device;
 - If there are some bubbles, hold the syringe vertically (cock facing up) and press the piston to eliminate the existing bubbles. Close the cock immediately (syringe in the vertical position);
- Clean carefully the syringe and accommodate it in the proper box;
- Identify the sample correctly.

5.2 Taking the insulating oil sample from drums or tanks

The new or regenerated oil sample supplied in drums must be collected after the drum has remained idle for at least 8 hours and at ambient temperature.

The sample must be removed by using a pipette or hose, which must be clean and dry.

It must be washed many times with the drum oil and the sample must be taken from a height of 2 cm from the bottom of the recipient.

If the sample is taken from the tank car, it is more practical to obtain them from the tank's lower valve. The valve must be cleaned completely, let 1 liter oil overflow before taking the sample.

IMPORTANT:

1. When collecting for physical-chemical tests, the oil can be taken only in a dry day, when the air relative humidity is lower than 70%;
2. The oil temperature must be equal or higher than the ambient temperature;
3. **The disposal of drained oil must follow the valid legislation and it may not be disposed in the environment.**

6. SAMPLING IDENTIFICATION

The samples must present, at least, the following identification:

- Company
- Substation
- Equipment type
- Serial number
- Voltage
- Power
- Identification in the substation
- Sampling date
- Sampling point