High voltage testing – Direct current (DC)

High voltage testing - Direct current (DC) - Photo by www.powertechlabs.com

DC Tests

DC tests are used mainly to do **"*pressure tests*" on high voltage cables**. Although the cables operate with AC, AC testing is not practical.
The high capacitance of the cables necessitates AC test sets with a high kVA rating to be able to supply the capacitive current. In the case of DC, **once the cable is charged**, only the losses have to be supplied.

DC test sets usually consist of ***half wave rectification, using HV selenium rectifiers***.

Typical DC test set-up is shown in ***Figure 1.***

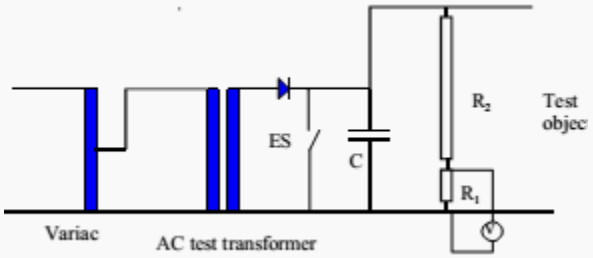

Figure 1 - Typical circuit for DC tests

An ***AC high voltage test transformer*** is again supplied via a ***variac*** and a ***rectifier*** is used together with a filter ***capacitor C*** to limit the ripple to acceptable values. The earthing switch ES is a safety feature and closes automatically when the power is switched off to discharge the capacitor C.
Note that the peak inverse voltage required of the rectifier is ***2 Vm***.

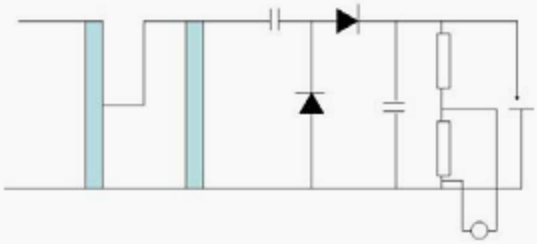

Figure 2 - Typical doubling circuit for DC tests

Doubling and multiplier circuits (*as used in TV's and household appliances*) are also used to obtain an even higher voltage. A typical ***Cockcroft-Walton*** (*in Germany: Greinacher*) doubling circuit is shown in ***Figure 2***.

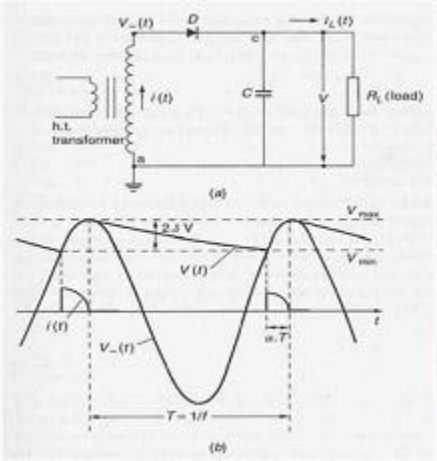

Figure 3 - Typical waveforms and a typical doubling circuit DC test source

Resource: *High Voltage Engineering Practice and Theory – Dr JP Holtzhausen; Dr WL Vosloo*

Source:

http://electrical-engineering-portal.com/high-voltage-testing-direct-current-dc