

The instantaneous amplitude of the induced voltage is proportional to the "RATE" of change of the magnetic flux and therefore is proportional to the rate of change of current! (electric current is the rate at which charge is moved from one point to another. R.A.C. Study Guide - Basic Qualifications, Page 2-3, also Henry on Page 4-3).

X_L or inductive reactance is equal to 2π times F times L or the opposition offered by the counter EMF, of an inductance is directly proportional to both the inductance and frequency.

The greater the inductance of any winding or circuit the greater will be its counter EMF at any given moment during the AC cycle.

The measurement of inductance is merely the measurement of the induced counter EMF under given circumstances.

Also the counter EMF depends not only upon the amount of the current change but upon the TIME interval required for that change. The higher the frequency the shorter is the time required for the current to change from zero to Max and consequently the greater the induced counter EMF. (Henry Basic RAC 4-2-3)

Because the rate of change of current increases directly with frequency, less current is required for a given induced voltage in an inductance of fixed value as the frequency is raised.

Also since the induced voltage is proportional to inductance for a given rate of change of current, less current is needed at a given frequency if the inductance is increase!

(Reference: Course in Radio Fundamentals, ARRL 1972, Chapter 7, Page 29)