where $A_c$ is the effective core cross sectional area of the desired core ($cm^2$).
$V_{in(nom)}$ is the typical operating input voltage (V).
$B_{max}$ is the maximum operating flux density (gauss (webers/$cm^2$)).

In the MKS System (Europe) system this is

$$N_{pri} = \frac{V_{in(nom)}}{4 \cdot f \cdot B_{max} \cdot A_c} \qquad (3.20b)$$

where $A_c$ is the effective core cross sectional area of the desired core ($m^2$).
$V_{in(nom)}$ is the typical operating input voltage (V).
$B_{max}$ is the maximum operating flux density (teslas (webers/$m^2$)).

Some core companies use still a third metric system, milliTeslas (mT), and mil imeters. These companies tend to be Japanese.

$$N_{pri} = \frac{V_{in(nom)} \cdot \quad ^{9}}{4 \cdot f \cdot B_{max} \cdot A_c} \qquad (3.20c)$$

where $A_c$ is the effective core cross sectional area of the desired core ($mm^2$).
$V_{in(nom)}$ is the typical operating input voltage (V).
$B_{max}$ is the maximum operating flux density (mT (webers/$mm^2$)).

This number of turns now serves as the reference winding upon which all the other windings will be determined.

Next, one determines the number of turns of the highest power output secondary winding. The voltage drop across the output rectifiers cannot be ignored. The equation to determine the number of turns for this winding is

$$N_{sec} = \frac{\cdot\ (V_{out} + V_{fwd})}{N_{pri}(V_{in(min)})\mathrm{DC}_{max}} \qquad (3.21)$$

where $V_{fwd}$ is the forward voltage drop of the anticipated output rectifier.
$DC_{max}$ is the maximum expected duty cycle (0.95 is good).
$V_{in(min)}$ is the minimum expected input voltage.

This equation can be solved for the needed secondary turns at the lowest anticipated input voltage. At any input voltage lower than that, the regulator will fall out of regulation.

The next step is to determine the number of turns for the other secondaries based on the turns of the first secondary winding. The starting point is

$$N_{sec(n)} = \frac{(V_{out(n)} + V_D)N_{sec(1)}}{(V_{out(1)} + V_{D1})} \qquad (3.22)$$

where $V_{out(n)}$ is the additional output voltage.
$V_D$ is the anticipated rectifier's forward voltage drop.

The result of this calculation will always yield a noninteger number, but many cores can only accept an integer number of turns. Therefore, one must round off the results to the closest integer. This results in an error in the eventual
One must ow check t
errors are too much for the applicati Using the original output's "volt
turn" value, calculate the new output volt

consider changing t echnology of the rectifier—to one t