PREFACE: Over a period of several decades of talking to many users and designers of airwound coils we have concluded that there are several aspects about these simple devices that are understood differently from person to person. We are therefore presenting the following to clarify these points:

1. NUMBER OF TURNS: Counting turns, as simple as it seems, differs from person to person. One definition is that the number of times that the wire crosses the form or mandrel that it is being wound on is the number of turns. The other method is to count the number of turns "showing" on the top of the finished coil. Please note that the number of turns showing on the bottom of the finished coil is not always equal to the number of turns showing on the top. It is important to specify how you are counting turns.
2. INSIDE DIAMETER: This applies primarily for all air wound coils. The question here relates to the form or mandrel diameter the coil is being wound on v/s the finished coil inside diameter. Most predominately when winding heavier wire gages on larger mandrels or forms a phenomenon many call "spring out" occurs. This is also influenced more by larger numbers of turns coupled with heavier wire gauges and larger diameters. More turns under these conditions result in more "spring out". This results in a larger inside diameter than the mandrel or form that the coil was wound on. Of course, this changes the coil inductance as well. If the coil design assumes no, so-called, "spring out" then compensations must be made to allow for this phenomenon to end up with the proper inside diameter.
3. SPACING: The spacing between turns is also influenced by the so-called "spring out" phenomenon described above. When winding heavier gauge wires on larger diameter forms or mandrels the "spring out" also manifests itself in larger spacing between turns. If the coil design assumes no such "spring out" compensation for the resulting increased spacing must be considered. Also, if the intent is to adjust the coil when tuning it in circuit one must consider having some space between turns. When there is no spacing wanted between turns one can specify that the coil is “close wound”. If some spacing is desired the applicable term would be “spread” and the assumption is that the spacing between all turns is uniform.
4. TUNING: Coils intended for tuning applications require some spacing between turns to allow for the movement needed. These so called "tuning" applications usually occur when the circuit requirements call for inductance tolerances smaller than those achieved in normal component manufacturing yields. Usually the tuning is accomplished in circuit by adjusting the individual turns actively, while observing the frequency response in an analyzer. Once they are "tuned" for the desired response they are usually secured using doping compound that has little affect inductance or Q variations. When the turns are "touching" they are assumed to be "close wound" and turning is either very difficult or impossible. This spacing may be small to allow for some tuning. Of course, the wider the spacing the greater the tuning range. The coil design should allow for any significant spacing between turns to maintain the desired nominal inductance. Coils to be “tuned” should be specified as “spread” windings.

5. LEADS: The leads on wound coils are part of the device. They contribute to the overall inductance of the part. Consideration must be made for the lead contribution to the overall inductance when designing the coil.

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6. TINNING: Tinning leads immediately adjacent to the windings of a coil many times results in "fusing" the first winding or two of the coil together. Of course, once these turns are "fused" together they can no longer be tuned. Cleaning parts that are "fused" together is not a solution. The more mass the greater the problem (bigger wire gauge).
7. SOLDER TEMPERATURE: Many applications call for high temperature solder for lead tinning because the resulting device will be subsequently wave soldered and reflow of the lead could be a problem. Using high temperature solder on small gauge coils presents another problem in that leads could be compromised (at the least will be difficult to solder at these temperatures). Make sure that the insulating wire coating that is specified is adequate for the solder reflow temperature it will exposed to.
8. WINDING DIRECTION: Most applications are wound clockwise but not always. It is important to specify winding direction (clockwise or counter-clockwise) and not assume that it is always clockwise.
9. ASSEMBLY: It is important to remember that if the coil's shape is modified it could also change the inductance value. Do not pick up or grasp the coil across the diameter of the part rather pick it up by the leads. Picking coils up across the diameter may result in modifying the inductance value and damaging the insulating layer on the wire. Since these components are usually mounted on PCBs that have been previously wave-soldered and the coil leads are probably pre-tinned it is only necessary to reflow the solder to attach them to the PCB. It is preferable to pick them up and place them by the lead first by one end of the coil and then by the other end reflowing the solder on each end of the part.

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