How to design induction coils yourself

The induction heater's **heating effect and output power** will be influenced by **shape, size, turns of induction coils, material and heating area of work-piece, turn ratio of secondary coil, coupling degree between induction coil and work-piece**. A well designed induction coil is the key of running an induction heater.

Standard **turn ratio** of **secondary coil** of our machines are always be X(16≤X≤20):1, and some applications need other turn ratio like X:2 or X:4, different turn ration need different induction coils to match.

Output frequency of our machines are depend on **dimension and turns of induction coils**, **shorter induction coils will bring higher output frequency**, but each machine have a **best output frequency (40KHz~50KHz is the best frequency range of our High Frequency machines) to bring a best heating effect**.

When output frequency is **too high**, machine will reduce output power and some element like IGBT or MOSFET will be **easy burn**, when output frequency is **too low**, machine will also reduce output power and machine will **stop working or appear Low Frequency alarm**.

- Turns of induction coils of **HF** machines (UM-15A-HF ~ UM-70AB-HF) for forging rods under **X:1** turn ratio.

Rod Diameter(mm)	For forging steel rods	For forging copper or aluminum rods	Remark
Ø20	**4 turns**	**8 turns**	When total length of induction coil is too short (turns can't be increased anymore), you can change other turn ratio machine or use the parallel induction coils to increase turns as **photo A** or **photo B**
Ø30	**3 turns**	**6 turns**	
Ø40	**3 turns**	**6 turns**	
Ø50	**3 turns**	**6 turns**	
Ø70 ~ Ø80	**2 turns**	**4 turns**	
Ø110	**1~2 turns**	**2~4 turns**	
Ø150 ~ Ø200	**1 turn**	**2 turns**	

- Turns of induction coils of HF machines (UM-15A-HF ~ UM-70AB-HF) for forging rods under X:1 turn ratio.

Turn Ratio (in secondary coil)	Total length of induction coil
X(16≤X≤20):1	**0.4~0.7 meter**
X(16≤X≤20):2	**1.2~1.6 meter**
X(16≤X≤20):3	**2.4~3.2 meter**

2 parallel induction coil with 8 turns

Photo A

3 parallel induction coil with 4 turns

Photo B