Preheating a titanium billet to temperature prior to rolling

**Objective**
To preheat a titanium billet to 1800 °F prior to entering a rolling mill

**Material**
- Customer supplied 4” (102mm) diameter/24” (610mm) long titanium billet

**Temperature**
1800 °F (1000 °C)

**Frequency**
2.7 kHz

**Equipment**
- Ambrell EKOHEAT 200kW 1.5-4.5 kHz induction heating system equipped with a remote work head containing six 40 μF capacitors
- A multi-turn helical induction heating coil designed and developed specifically for this application

**Process**
The titanium billet was placed inside the multi-turn induction heating coil. The part was heated for five minutes, which was necessary to reduce the temperature difference between the center and outside of the billet. Due to the considerable diameter of the part, a high power, low frequency induction power supply was used. Considerable effort went into designing the coil to ensure the most uniform heating possible while still minimizing heating time.

**Results/Benefits**
- Speed: Induction heated the large billet quickly, and will also heat the client’s longer 15 foot billets
- Uniform heating: Induction’s rapid, even heating enabled a uniform temperature throughout the billet
- Repeatability: This process will provide consistent results, so the client can design their process around the five-minute heating time
The billet inside the induction heating coil

The billet heating inside the induction heating coil