

# MAKING COPPER WORK FOR YOU.

## OVERVIEW

COPPERWORKS is proud to offer our innovative fire refined high conductivity (FRHC) Advantage™ and Infinity™ Copper Rod products. Both conductors meet or exceed ASTM B49 specifications, and our Infinity product carries an industry-leading lowest carbon footprint and is certified as being produced with 100% recycled content.

In this Copper Paper, we present the typical process parameters and applications for this material. These products have a proven track record at a variety of downstream wire drawing facilities, and we look forward to adding your facility to the list.

## LEVERAGING COPPERWORKS EXPERTISE

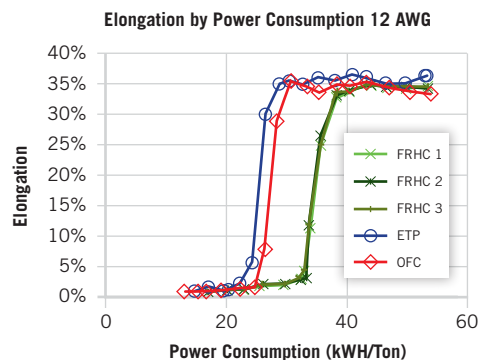
Our expert engineering team will engage with your operations and quality teams to learn about your wire mill equipment and process parameters. Following this investigation, the COPPERWORKS team will visit your facility to assist with a material trial. We have experience with a variety of wire mill and annealing set-ups, and we are often able to establish an annealing curve and achieve required elongation in a single day.

## PROCESS PARAMETERS

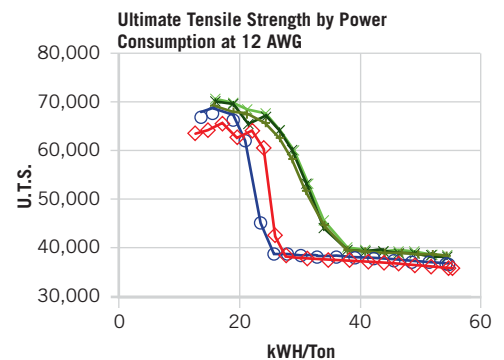
Establishing the annealing curve is the key to making FRHC copper rod a success at your facility. In the graphs shown below, you can see the relationship between the annealer voltage and the corresponding tensile elongation for different copper types at 12 AWG solid.

AWG Size	12 AWG
ASTM Minimum	25%
FRHC 1	34.5%
FRHC 2	35.0%
FRHC 3	35.0%
ETP	36.5%
OFC	35.5%

*Elongation results attained with each material at the tested size*



*Relationship of elongation to the annealing power*



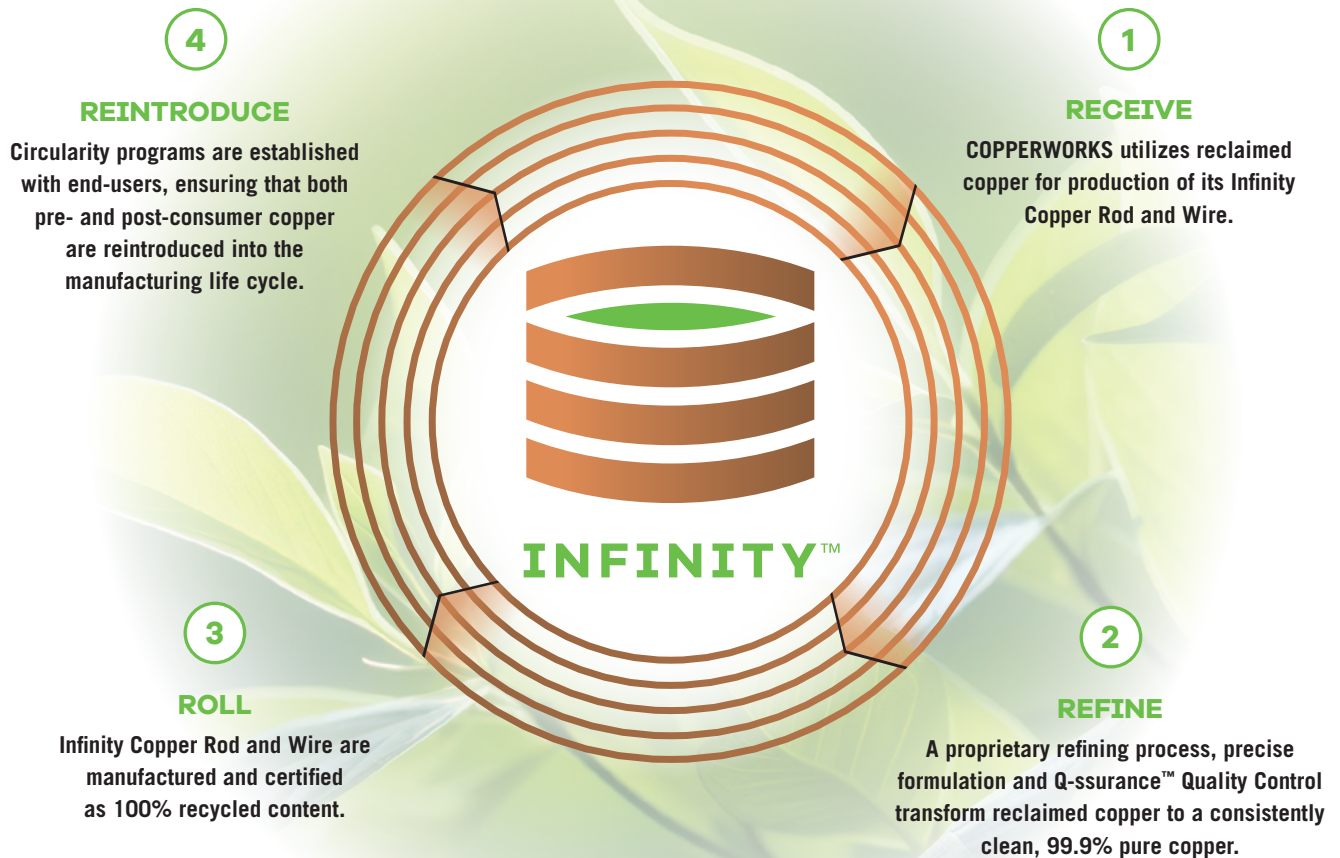
*Relationship of ultimate tensile strength to the annealing*

Most annealers are capable of reaching the required voltages, and slight control modification is sometimes needed to access higher set points. Annealer manufacturers typically control voltage using a square root function with the wire speed. This eliminates the need to change voltage for different sizes and speeds, especially during ramp up and down. This can often be resolved by selecting a different annealer transformer tap setting. Some designs may require a technician or the manufacturer to make an adjustment in the PLC controls to modify or remove this upper voltage limit. Rest assured that the COPPERWORKS team will be involved each step of the way.

---

## CIRCULARITY

COPPERWORKS is proud to offer circularity programs where we collect scrap generated from our customers' manufacturing processes and convert this scrap to new copper rod. These tolling programs ensure you are receiving the full value of the copper scrap.



---

## SUMMARY

COPPERWORKS Advantage and Infinity products have a proven track record at a variety of wire and cable facilities. These products can be leveraged to make a wide range of electrical conductors, giving your facility a leg-up on the competition.

We make copper work for our customers and our planet. Reach out to your COPPERWORKS representative to learn more!  
[COPPERWORKS.COM](https://www.copperworks.com) | 260.748.6565