



## Custom Processes for Manufacturing Long Bars Used in Magnetometers & Antennas

Within the magnetics industry, the manufacturing of long nanocrystalline bars has a reputation as a difficult item to produce economically. As highlighted in this product development project, MK Magnetics' biggest task was to overcome the fragile nature of long and narrow nanocrystalline bars while maintaining high permeability properties.



Our initial goal involved producing bars with a .500" cross section and length of 24". With our technical insight into nanocrystalline materials and innovative process technologies, we established and then refined specialized manufacturing and assembly methods for producing bars with superior magnetic performance.

Once MK Magnetics stabilized the annealing and bonding process, we developed prototypes and subjected them to a rigorous set of tests to measure core loss, permeability, and inductance. Testing confirmed that we met all of the performance criteria, allowing us to ramp up to production-level manufacturing.

Since the initial development, we have expanded our production capabilities for these products to include even longer bars, up to 84"+ with cross sections as small .125". We also manufacture bars that require specialized machining and unique shapes. The flexibility of the manufacturing processes that we subsequently developed allows us to create geometries that are considered unconventional in the tape core industry. For more information, see the table below or [contact](#) us directly.

## Long Nanocrystalline Bars Case Study Highlights

<b>Project Name &amp; Description</b>	Manufacturing Processes for Long Bars
<b>Capabilities Applied/Processes</b>	<ul style="list-style-type: none"> <li>• Unique assembly and manufacturing processes</li> <li>• Special annealing and bonding processes</li> </ul>
<b>Overall Part Dimensions</b>	Typical Range: cross section from .125" x .125 to 2" x 2"+, lengths up to 84"+
<b>Material Used</b>	Nanocrystalline for maximum permeability
<b>Industry for Use</b>	Oil & Mineral Exploration, Directional Drilling
<b>In Process Testing/Inspection Performed</b>	Core Loss, Permeability/Inductance
<b>Volume</b>	Prototypes to mass production
<b>Delivery/Turnaround Time</b>	3 - 5 weeks typical