

## Recommending I-Rod / Nu-Bolt products based on temperature

Nu-bolt assemblies have two polymer components: The pipe support, and the U-Bolt Coating. There are three I-Rod materials available, and three possible U-bolt options. Choosing the right Nu-bolt for your application can be tricky.

Using these materials at temperatures outside of their rated range will result in loss of strength (softening and melting), cracking and ultimately lead to failure.

The following tables summarize key points and tested data for the materials. If no data is listed, it has not been tested. In addition, some materials may perform outside of these boundaries, but they are not rated, or proven to do so.

*Table 1: Pipe Support Materials*

Pipe Support Material	Temperature Notes
<b>I-Rod (White)</b>	For cryogenic and normal atmospheric temperature service
<b>I-Rod HT (Amber)</b>	For high temperature service
<b>I-Rod PEEK (Tan)</b>	For high strength, high temperature service
U-Bolt Coating Material	
<b>Bare U-Bolt</b>	For cryogenic and extremely high temperature service
<b>Polyolefin (Black, thick)</b>	Medium temperature service
<b>HT Shrink</b>	For high temperature service

*Table 2: Nu-Bolt Polymer Material Temperature Limits*

Material	Max. Excursion Temp. (melt)	Max. Continuous Temp.	Min. Continuous Temp.
<b>I-Rod (White)</b>	168°C / 329°F	83°C / 181°F	-110°C / -166°F
<b>I-Rod HT (Amber)</b>	210°C / 410°F	171°C / 340°F	
<b>I-Rod PEEK (tan)</b>	340°C / 644°F	249°C / 480°F	
<b>Polyolefin (Black, thick)</b>		110°C / 230°F	-55°C / -67°F
<b>HT Shrink (black, thin)</b>		220°C / 428°F	-55°C / -67°F
<b>I-Rod Adhesive</b>	100°C / 212°F	22-50°C	-40°C

On the graph below, we can see the recommended operating temperatures for various polymer Nu-bolt materials. The dashed lines indicate excursion ranges; the temperature that the material can reach for brief periods of time without immediate failure. The solid lines indicate the appropriate temperature range for the product to reach its maximum lifetime.

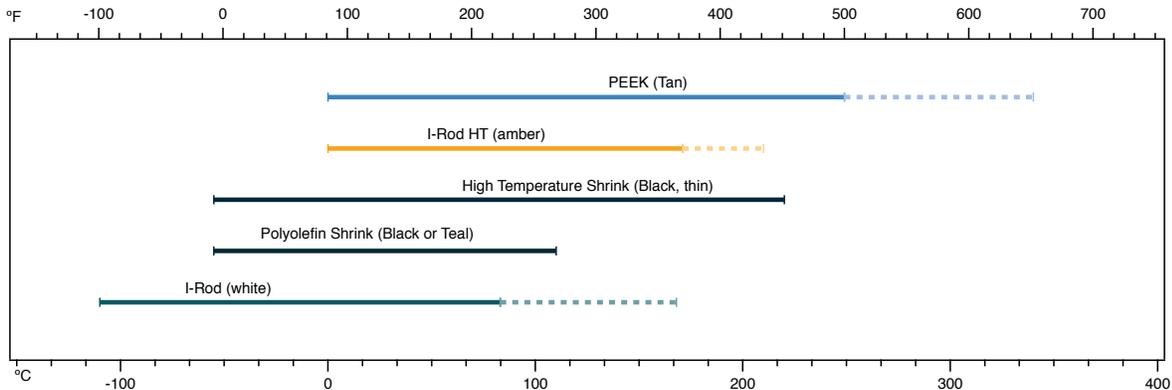


Figure 1: Temperature ranges of Nu-Bolt Materials

The following chart can be used as a guide to determine what is the most likely combination of support and U-bolt for a given customer's needs (not including excursions).

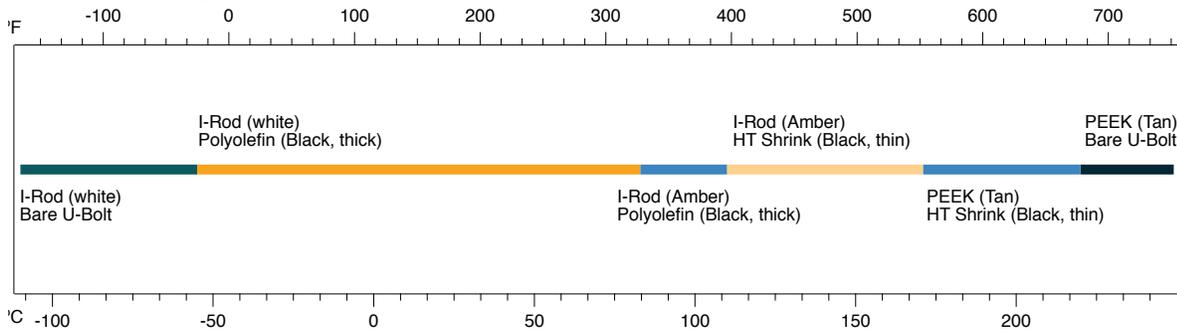


Figure 2: Recommended Nu-Bolt Configuration for a given continuous maximum temperature range.

I-Rod strips (White) can be adhered to concreted, bare, or painted metal using I-Rod Adhesive. I-Rod, I-Rod HT (Amber) and I-Rod PEEK (Tan) can be bolted down per our normal installation procedures. Since the useful temperature range for I-Rod Adhesive is well below that of I-Rod HT, it is not recommended for elevated temperature use.

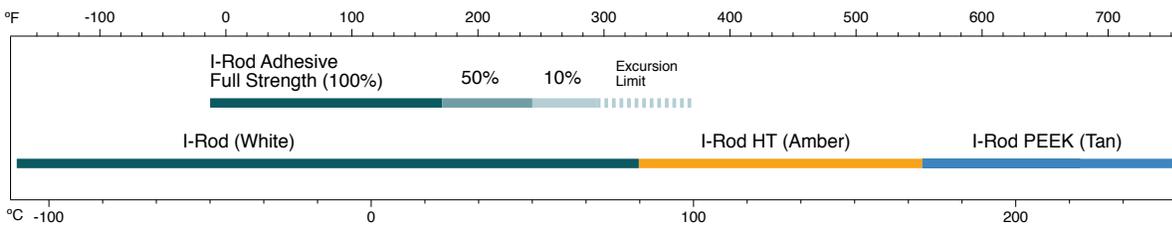


Figure 3: I-Rod strips and I-Rod Adhesive Useful Ranges

**Note:** I-Rod Adhesive must be stored between 8-28°C (47-82°F) and applied as warm as possible; 20°C (68°F) preferred.