OSENSA INNOVATIONS

Engineered for Precision Built for Reliability

# Fiber Optic Use and Handling: Best Practices for Small Diameter Temperature Probes

# The Instructions Apply to the Following OSENSA Probes:

| Model Number | Maximum Temperature | Bend Radius (mm) |
|---|---|---|
| PRB-242-2M-MRI | 150°C | 16 mm |
| PRB-140-#M-MRI | 150°C | 6 mm |
| PRB-G40-#M-MRI | 150°C | 15 mm |
| PRB-G40-#M-C | 250°C | 60 mm |
| PRB-G40-#M-HC | 350°C | 60 mm |
| PRB-G20-#M-C | 250°C | 30 mm |
| PRB-G20-#M-HC | 350°C | 30 mm |
| PRB-400-2M-MRI | 100°C | 45 mm |

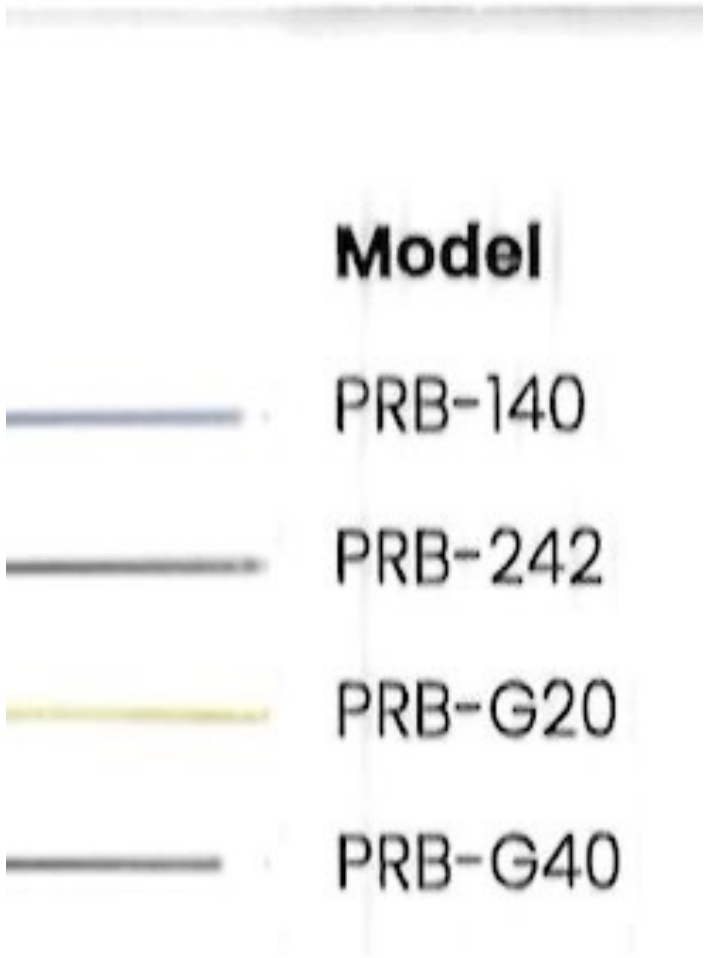
# Application Goals, Temperature Ratings, and Probe Limits

## Purpose and Handling Goals

- The application aims to improve placement accuracy, reduce probe breakage, and minimize cleaning damage.

## Temperature Ratings Importance

- Maximum temperature applies to the probe tip, while connectors have lower limits requiring system-level temperature awareness. Connector Temperature Rating is 100°C.



# Application Goals, Temperature Ratings, and Probe Limits

## Operating Limits and Risks

- Exceeding temperature or mechanical limits risks measurement drift, connector damage, or probe failure, especially near hotspots. For Microwave Heating applications, due to uneven EM fields, local hotspots can occur which may exceed temperature limits so bring up power slowly or vary duration of pulses.

- Understanding bend radius and temperature limits ensures appropriate probe selection and prolonged service life. Bend Radius is specified in the previous chart.

- Calibration and entering offsets for accurate readings

# Mechanical Handling and Installation

## Bend Radius Importance

- Maintaining proper bend radius avoids signal loss and prevents fiber damage or snapping during use.

## Safe Human Handling

- Avoid sharp objects and wear gloves to prevent contamination and physical damage to probes during handling. Do not manipulate probes with pliers.

# Mechanical Handling and Installation

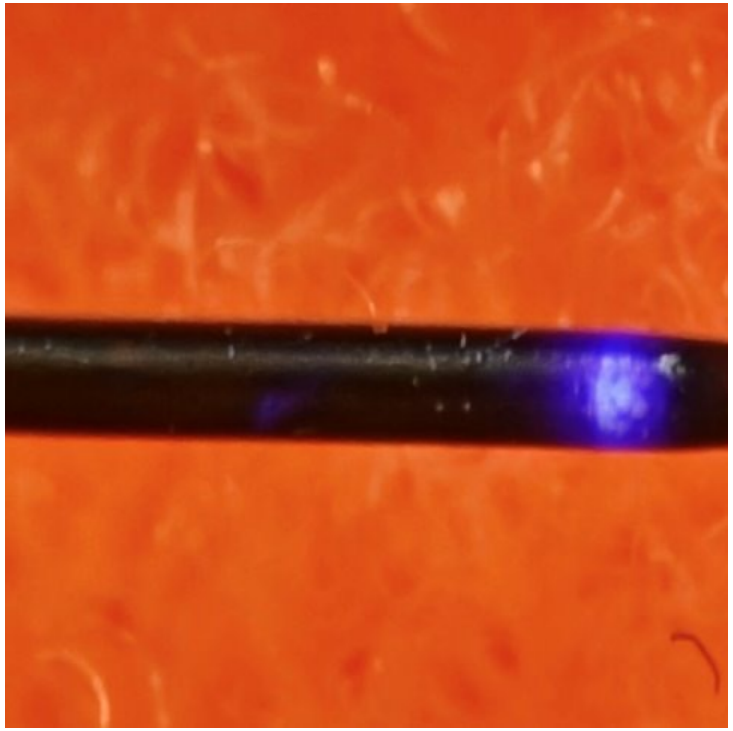
## Mounting Best Practices

- Apply only light pressure and avoid sticky adhesives by using non-adhesive barriers for safe probe mounting. Examples of an adhesive solution that is safe for probes, consider a Band-Aid which have a non-stick section. Removing a sticky tape on a fiber can exceed bend radius during removal process. For MRI, the probe to extension cable interface can be held down with non-magnetic sandbags at the foot of the MRI scanner. Connect cables with plastic (not metallic) ST-ST couplers. It is not recommended to use an adhesive on a probe because the probe may be damaged during the removal process.

## Proper Insertion Techniques

- Create holes beforehand and avoid using probes as awls to prevent bending or breakage during insertion. Holes can be made with Delron Rods for MRI applications in phantoms.

# Mechanical Handling and Installation



## Locating

- Fiber Optic probes glow when excited
- The sensor will glow in dim light
- Use a Fiber Optic Fault Indicator with ST connector to illuminate Sensor
- Align Sensor with Feature for Temperature Measurement.

# Use in Liquids, MRI Environments

## Use in Liquids

- Probes must operate within temperature limits and avoid liquids that degrade materials like Teflon or epoxy. Probes should not be used in strong acids or bases. Protect sensors from strong light.

## MRI Environment Precautions

- Probes should be held down with non-metallic sandbags at the foot of the MRI bed. Fiber Optic couplers should be plastic, not metallic.

# Cleaning and Storage

## Cleaning Procedures

- Rinse first in deionized water. Then use approved disinfectants or isopropyl alcohol for cleaning, avoid immersing connectors, and wipe carefully from 1” past the tip end to the connector strain relief. Clean with McKesson High-Level Disinfectant Solution for Medical Instruments, such as OP-28.

## Proper Storage

- Store probes loosely coiled, respecting the minimum bend radius, with tips protected and clearly labeled to prevent damage and errors. They store well in square transparent plastic bags. Spiral cable wrap can be used to hold coils. Store with Fiber Optic Connector dust caps on the probes and Temperature Transmitters.

# Next Steps…

# Any Questions

OSENSA Innovations Corp.
hvine@osensa.com
973-809-6822
Website: www.osensa.com