

# TECH TIPS

# TIMKEN

WORLDWIDE LEADER IN BEARINGS AND STEEL

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Promoting safe, proper bearing handling practices for the heavy-duty market

## Proper heating and freezing practices when installing press-fit cones or cups

**T**apered roller bearings often must be cooled or heated to aid in assembly or removal from housings with a press fit. Since temperature extremes can cause permanent bearing metallurgical damage, it is important to take proper precautions and use correct methods when heating and cooling bearings.

Cups that are to be assembled in hubs or housings with a press fit, particularly in aluminum or magnesium hubs, may be shrunk in a deep freeze unit. Standard class bearings should not be cooled below  $-65^{\circ}\text{F}$ . In addition to cooling the bearing cup, in some instances it may be necessary to heat the housing.

To control temperature, it is best to use a thermostat along with a freezer unit or a properly calibrated thermometer. If a suitable freezer or thermometer is not available, your Timken service representative can suggest liquid combinations that freeze the bearing cup at the optimal temperatures. Regardless of the method, check the cup's final seating against the housing shoulder with feeler gauges.

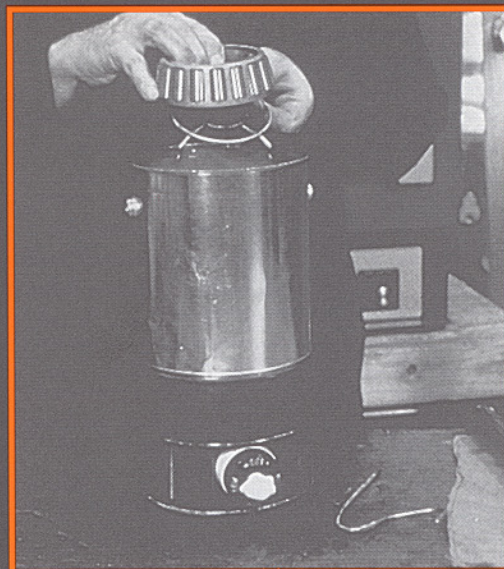
Take extreme care that standard product bearings are never heated above  $300^{\circ}\text{F}$  ( $149^{\circ}\text{C}$ ). If bearings are heated above this temperature, their metallurgical structure may soften, rendering them unsuitable for use.

There are a number of recommended methods for heating bearings. Electric ovens or electrically heated oil baths may be used, but only when accompanied by proper thermostatic control. If you use a hot plate to heat the oil, never rest bearings directly on the bottom of the pan. Instead, protect bearings from the heat source with a simple wire screen holder or similar device.

Use heat-resistant gloves to handle heated cones. Hold the hot cone solid against the cold shoulder on the shaft until the cone grabs on to the shaft. The hot cone will pull away from the cold shoulder unless it is held in position. Use feeler gauges to make sure the cone is fully seated against the shoulder after the parts are cooled. Many loose bearing settings (excessive end play) are caused by an unseated cone working back against the shoulder in service.



Thermostatically-controlled freezer units aid in the installation of tight-fitted cups in housings.



Hot oil pots, with a tray or hook to support the cone, effectively ease the installation of tight cones on shafts.