Bearing Induction Heaters — Why Heat Beats Force, the 110 °C Rule and SKF TIH/TWIM/TMHN

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Why interference-fit bearings go on with controlled heat instead of a hammer or press, what 90 K of expansion buys on a shaft seat, the 110 °C ceiling and automatic demagnetisation that induction heaters enforce, picking between the stocked SKF TIH, TWIM and TMHN classes, and the mounting sequence that ends premature failures.

The physics of a clean mount

An interference-fit bearing must grow before it slides onto its seat — a modest 90 K temperature rise expands a 100 mm bore by roughly a tenth of a millimetre, exactly the clearance a typical fit needs. Force it cold instead and the mounting force passes through the rolling elements, brinelling raceways before the machine ever turns: the classic 'new bearing, old noise' story. Controlled heating is therefore the method — and induction is the controlled way: fast, flameless, no oil bath to contaminate the very component made of tolerances (bearing selection guide).

Two rules the good heaters enforce for you

110 °C ceiling: standard bearing steel begins to lose its stabilised hardness with overheating, and seals/cages tolerate less — mounting practice keeps ordinary bearings at or below ~110 °C, measured at the ring, not assumed from time. Temperature-probe control (the stocked units' mode) beats stopwatch heating every day.

Demagnetise on completion: induction leaves residual magnetism that collects wear swarf on raceways; proper heaters run an automatic demag cycle at switch-off. A heater without it is half a tool.

The stocked SKF classes

Class | Pattern | Fits |

TIH 15 / 230 V | The bench yoke heater — swing-arm, interchangeable support ledges | Workshop mounting of small/mid bearings and ring-shaped parts (couplings, gears heat too) |

TWIM 15 | Flat portable induction plate | Field work and odd shapes — heats without a yoke through the component resting on it |

TMHN 7-34 | Compact ring-nut/small-component heater class | Small-bore series work |

Sizing is by the largest bearing's weight and bore the shop must mount — a heater one class up costs less than one brinelled spherical roller (the SRB finder has the bore tables). Around 300 heater-and-tool rows sit in the stocked SKF maintenance-products range.

The mounting sequence that works

Measure shaft seat and bore; confirm fit class (ISO 286 chart). Clean, deburr, oil film on the seat.

Heat to target (90–110 °C for ordinary fits), slide in one motion to the shoulder, hold square until it grips — a cooling bearing that stopped 2 mm short is mounted wrong forever.

Let it cool clamping the seat; then lubricate per the grease guide (quantity, not 'full') and align per the coupling guide.

Sealed bearings, polymer cages and anything pre-greased check their own temperature limits first — some caps sit below 110 °C.

Heaters, fitting tool kits, hydraulic nuts and the bearings themselves quote within 24 hours — state the largest bearing designation the tool must handle and the mounting cadence (occasional vs production) and the right class comes back justified.

Frequently asked questions
Why not mount bearings with a press or hammer?Cold mounting drives the fit force through the balls or rollers into the raceways, denting them microscopically (brinelling) — the bearing then fails early with a characteristic rhythmic noise. Heat expands the ring so it slides on with no force through the rolling elements at all.How hot should a bearing be for mounting? Enough for the fit — typically 80–110 °C does it, and 110 °C is the ceiling for standard bearings before metallurgical and seal/cage risks begin. Probe-controlled induction heaters hold the target; never judge by time or smoke.Does an induction heater magnetise the bearing?Yes, inherently — which is why proper units end every cycle with an automatic demagnetisation sweep. Skipping it leaves raceways that attract steel wear particles, quietly grinding themselves.Can I heat gears and couplings on a bearing heater?Any ring-shaped steel part within the heater's weight and geometry limits mounts the same way — couplings, gear rims, labyrinth rings. The flat TWIM-pattern units are especially flexible for awkward shapes.Is an oil bath still acceptable for heating bearings?It works thermally but soaks a precision component in a contamination source and offers crude temperature control. Induction took over for cleanliness, speed and the built-in temperature/demag discipline — the bath survives only where no heater exists.

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