

THERMAL CONDUCTIVITY – STAINLESS STEEL

Galling during assembly with automatic screwdrivers

Overview

When assembling stainless-steel nuts on screws or threaded parts, galling can occur (nut locking on the male thread). The phenomenon mainly depends on two factors: a physical one (material properties) and a technical one (tool settings).

Factor 1: thermal conductivity

Stainless steel has a low thermal conductivity k . During tightening, friction rapidly heats the contact surfaces; poor heat dissipation can contribute to galling.

Material	k at 20°C (W/(m×K))
Steel Cr 20% (INOX)	22
Bronze Cu 75%, Sn 25%	26
Lead	35
Carbon steel C 1.5%	36
Carbon steel C 0.5%	54
Steel Cr 1%	61
Tin	64
Platinum	70
Iron	73
Brass Cu 70%, Zn 30%	111
Zinc	112
Aluminium	204
Copper	386
Silver	407

Stainless steel grade	k at 20°C (W/(m×K))
1.4301 (AISI 304)	15
1.4401 (AISI 316)	15
1.4305 (AISI 303)	15
1.4567 (AISI 302Cu)	11.3
1.4460 (AISI 329)	15
1.4016 (AISI 430)	25
1.4006 (AISI 410)	30
1.4029 (AISI 416)	30
1.4031 (AISI 420)	30
1.4057 (AISI 431)	25
1.4542 (AISI 630)	16

Factor 2: screwdriver speed

Automatic screwdrivers are often factory-set for zinc-plated fasteners. With stainless steel, reducing tightening speed helps limit galling.

How to limit galling?

FIMINOX provides different solutions and methods for each application. Contact our offices for details.