

1.4. Alloy

High-strength Zinc Alloy

The high-strength zinc alloy used in the spline nuts, screw nuts and change nuts is a material that is highly resistant to seizure and wear and has a high load carrying capacity. Its composition, mechanical properties, physical properties and wear resistance are given below.

●Composition

Table 1 Composition of the High-strength Zinc Alloy Unit: %

Al	3 to 4
Cu	3 to 4
Mg	0.03 to 0.06
Be	0.02 to 0.06
Ti	0.04 to 0.12
Zn	Remaining portion

●Mechanical Properties

Tensile strength:	275 to 314 N/mm ²
Tensile yield strength (0.2%):	216 to 245 N/mm ²
Compressive strength:	539 to 686 N/mm ²
Compressive yield strength (0.2%):	294 to 343 N/mm ²
Fatigue strength:	132 N/mm ² × 10 ⁷ (Schenck bending test)
Charpy impact strength:	0.098 to 0.49 N·m/mm ²
Elongation:	1 to 5 %
Hardness:	120 to 145 HV

●Physical Properties

Specific gravity:	6.8
Specific heat:	460 J/(kg·K)
Melting point:	390 °C
Thermal-expansion coefficient	24 × 10 ⁻⁶

●Wear Resistance

Amsler wear-tester:	
Test piece rotation speed:	185 min ⁻¹
Load	392 N
Lubricant:	Dynamo oil

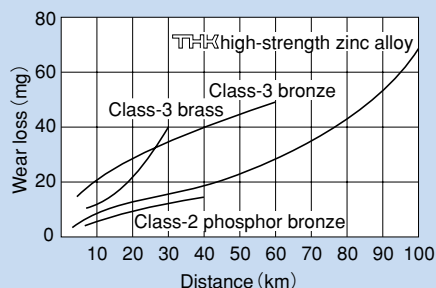


Fig. 1 Wear Resistance of the High-strength Zinc Alloy