

## 1.3. Alloy

### High-strength Zinc Alloy

The high-strength zinc alloy, developed as an alloy for bearings, is composed of Al, Cu, Mg, Be and Ti as well as zinc as the base. It is excellent in mechanical properties, seizure resistance and wear resistance.

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

#### ●Physical Properties

Specific gravity:	6.8
Melting point:	390 °C
Specific heat:	460 J/(kg·K)
Linear expansion ratio:	24 × 10 <sup>-6</sup>

#### ●Wear Resistance

The wear resistance of the high-strength zinc alloy is superior to that of class-3 brass and class-3 bronze, almost equal to that of class-2 phosphor bronze.

Amsler wear-tester:	
Test piece rotation speed:	185 min <sup>-1</sup>
Load:	392 N
Lubricant:	Dynamo oil

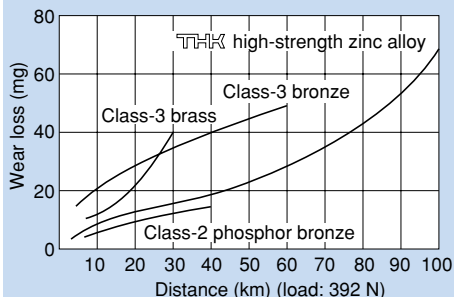


Fig. 1 Wear Resistance of the High-strength Zinc Alloy