

KEPITAL NX-10 Introduction

(high-viscosity and wear-resistance grade)

R&D Center

1. Characteristics

- (1) KEPITAL NX-10 is a high viscosity polyacetal which has good friction and wear resistance.
- (2) KEPITAL NX-10 exhibits excellent tribological properties under moving conditions against various counterpart materials.
- (3) KEPITAL NX-10 has good mechanical properties and creep resistance compared to other types of friction and wear grades provided by KEP.
- (4) KEPITAL NX-10 can be applied to various applications which require good friction and wear resistance without sacrificing mechanical properties in automotive, electric & electronics and industrial fields.

2. General Properties

The general properties of KEPITAL NX-10 grade are displayed in table 1. KEPITAL NX-10, a high viscosity and friction & wear resistance grade, exhibits not only better mechanical properties compared to our competitor's grade, but also excellent creep and friction & wear resistance.

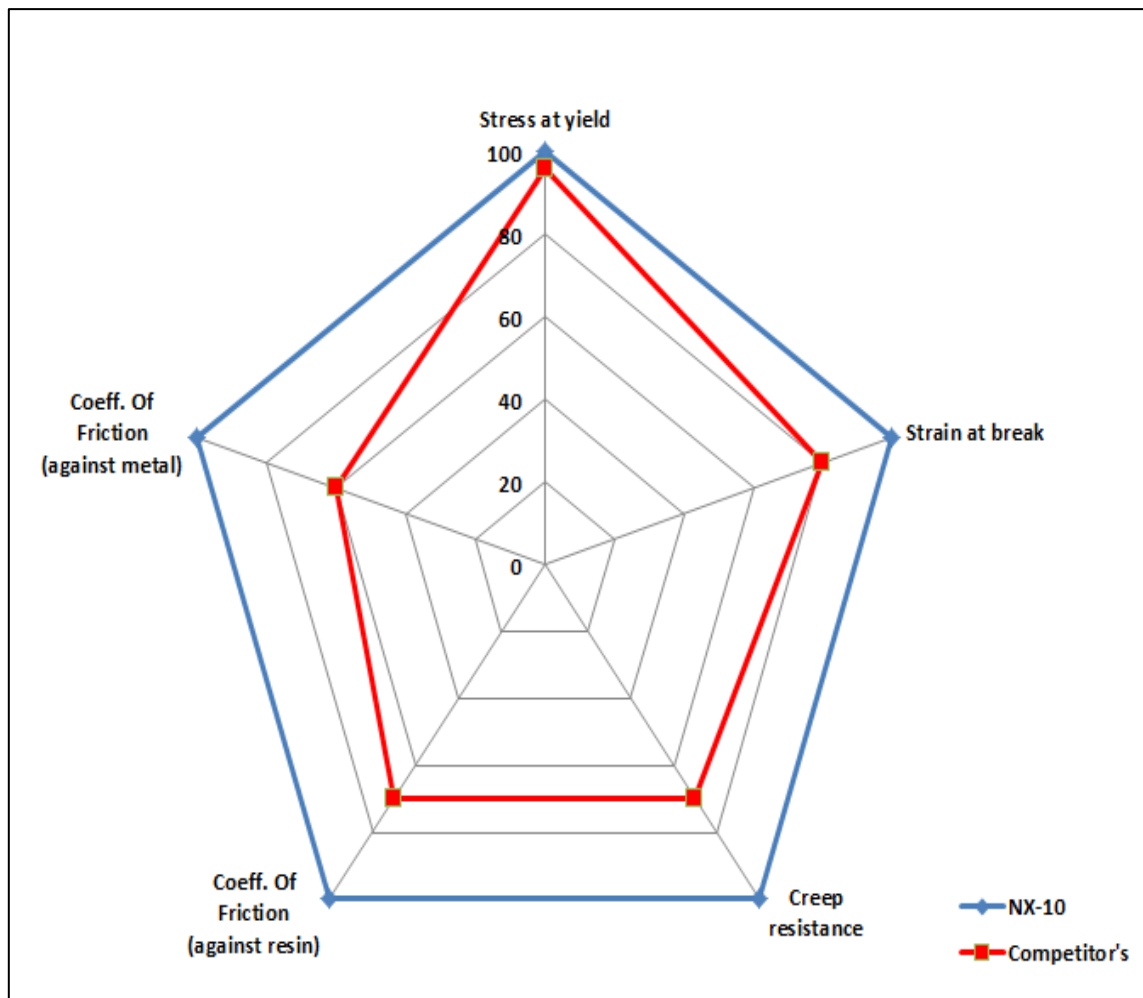


Table 1. Typical properties of KEPITAL NX-10

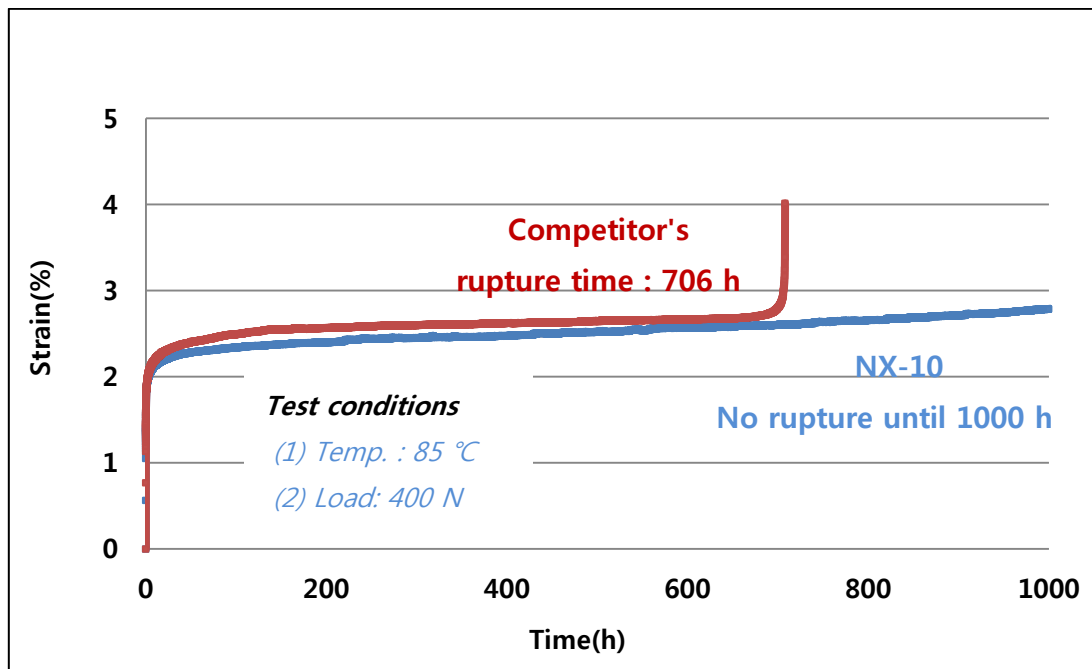
Description		Test method	Unit	KEPITAL NX-10 ^a	Competitor's ^b
Physical	Density	ISO 1183	g/cm ³	1.37	1.37
Thermal	Melt index	ISO 1133	g/10min	3.3	9.0
	Melting temperature	ISO 3146	°C	165	165
	HDT (1.8 MPa)	ISO 75	°C	100	100
Mechanical	Tensile strength	ISO 527	MPa	60	58
	Elongation at yield	ISO 527	%	14	11
	Nominal strain at break	ISO 527	%	25	20
	Flexural strength	ISO 178	MPa	80	84
	Flexural modulus	ISO 178	MPa	2,400	2,500
	Charpy impact strength (notched, 23 °C)	ISO 179/1eA	kJ/m ²	6.5	5.6

a. KEPITAL NX-10 data is preliminary data .

b. The competitor's properties as measured by KEP.

3. Creep Resistance

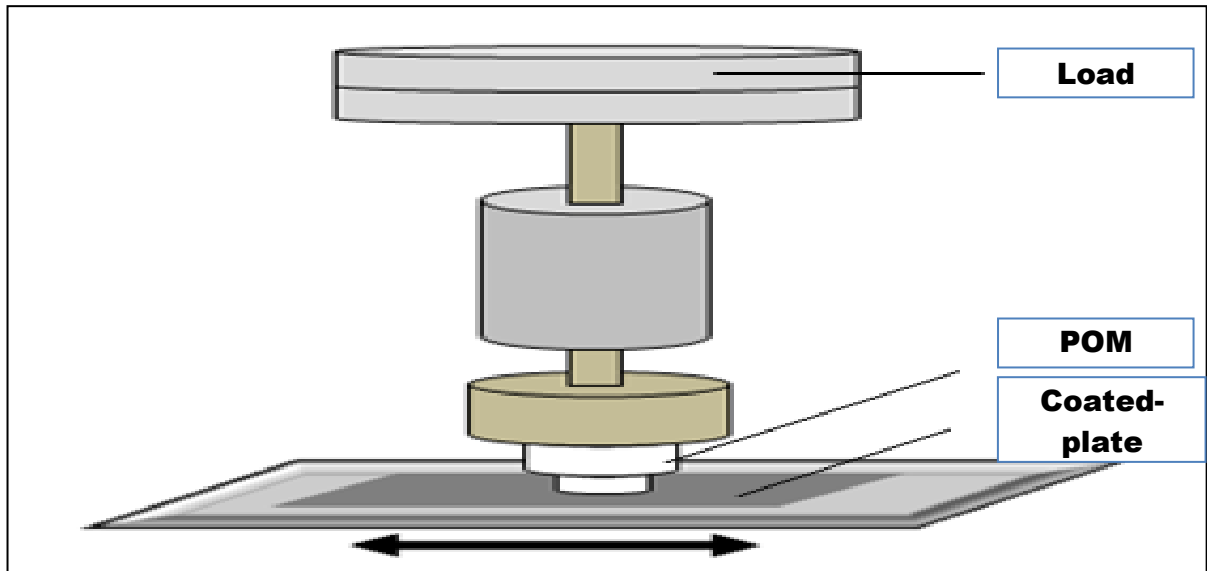
The tensile creep resistance of KEPITAL NX-10 grade is displayed in figure 1. Creep deformation occurs due to constant stress over long periods. As such, creep resistance properties are inversely proportional to deformation. KEPITAL NX-10 exhibits better creep resistance compared to our competitor's grade.



[Figure 1] Tensile creep resistance of KEPITAL NX-10

4. Tribological Properties




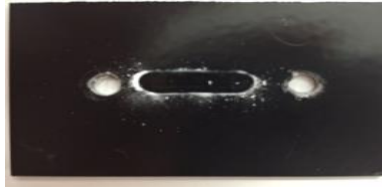
KEPITAL NX-10 exhibits better tribological properties against various counterpart materials compared to our competitor's grade. The Pin-on-Disk type (linear reciprocation motion) test method is shown in figure 2 and the test results such as dynamic friction coefficient and surface of counterpart material are displayed in table 2 and figure 3.



[Figure 2] Test method for Pin-on-Disk type

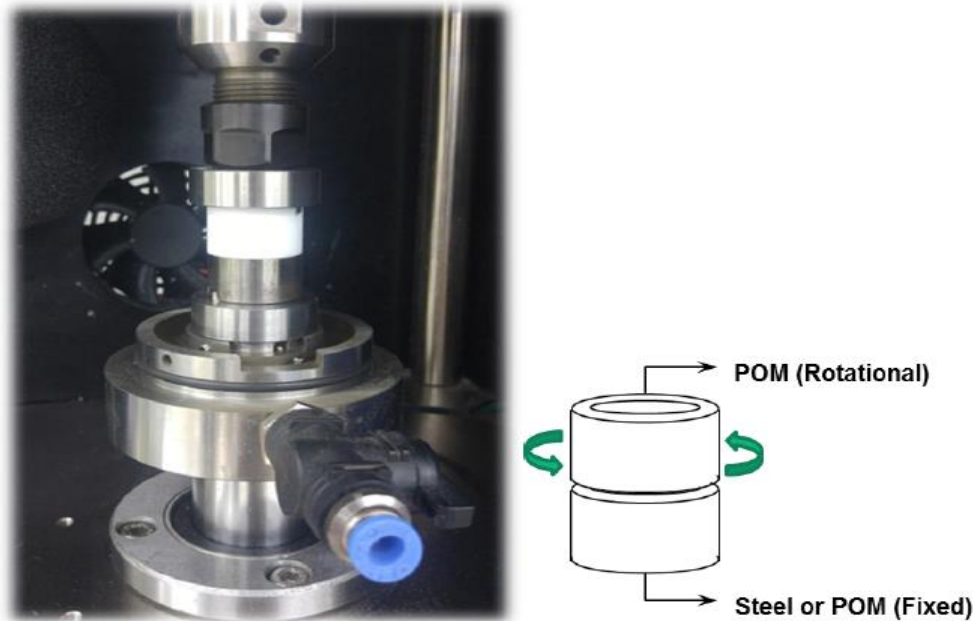
Table 2. Dynamic friction coefficient under various loads

Load	Dynamic friction coefficient (-)	
	NX-10	Competitor's
5 kgf	0.020	0.034
10 kgf	0.036	0.065

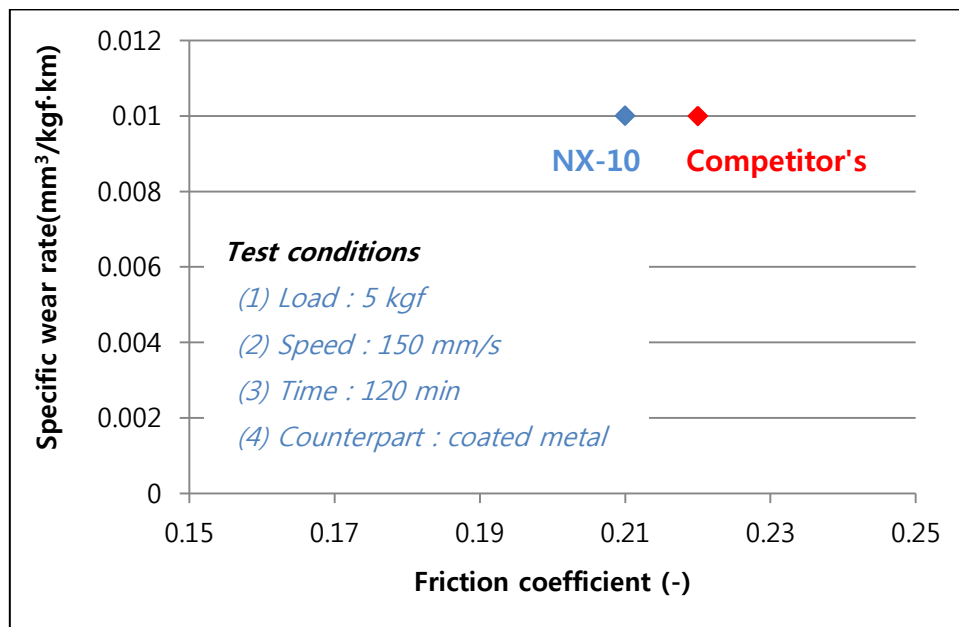
Load	NX-10	Competitor's
5 kgf		
10 kgf		

[Figure 3] Surface of counterpart material after evaluation

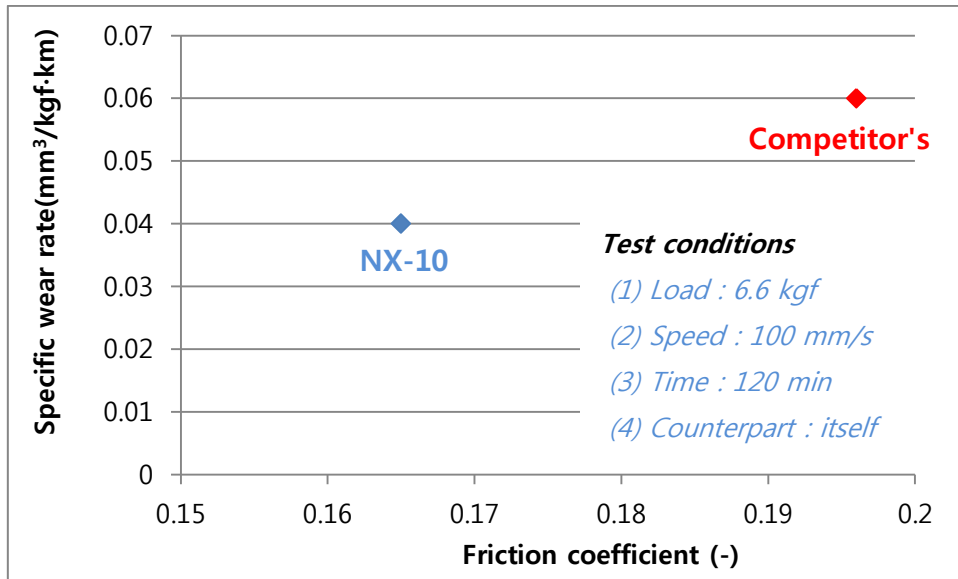
The friction and wear resistance properties of plastics generally change contingent upon pressure, operation speed, temperature and humidity. In addition, they can change according to which machine is used for the test. Another type test method, Thrust Washer(rotation motion), is shown in figure 4. The test results of friction and wear resistance properties (dynamic friction coefficient, specific wear rate) against various counterpart materials are also shown in figures 5, 6 and 7.



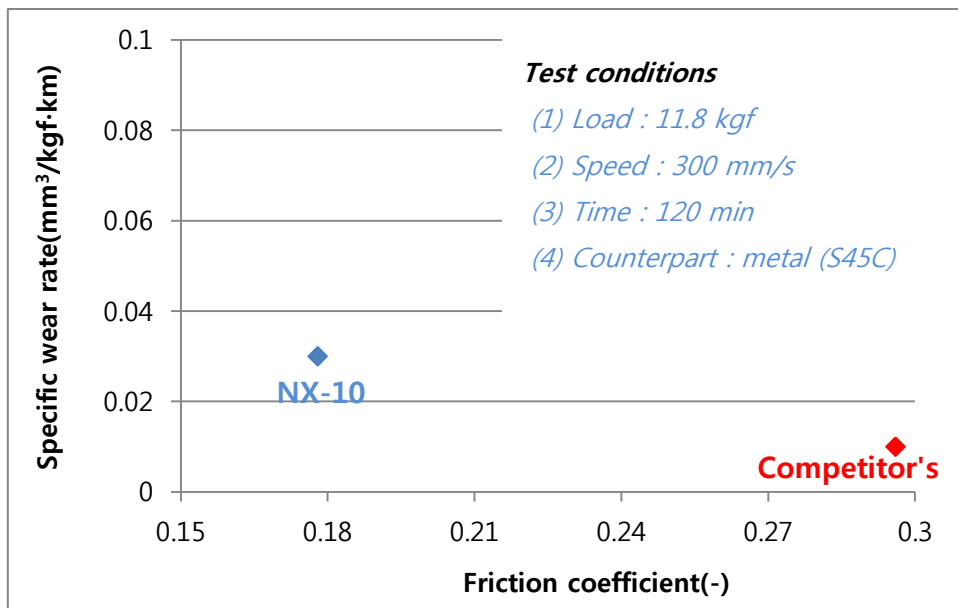
[Figure 4] Test method for Ring-on-Ring type (Thrust Washer)



[Figure 5] Friction coefficient and specific wear rate of KEPITAL NX-10 (vs. coated metal)



[Figure 6] Friction coefficient and specific wear rate of KEPITAL NX-10 (vs. resin)



[Figure 7] Friction coefficient and specific wear rate of KEPITAL NX-10 [vs. metal(S45C)]

5. Injection Molding Guide

(1) Standard molding conditions

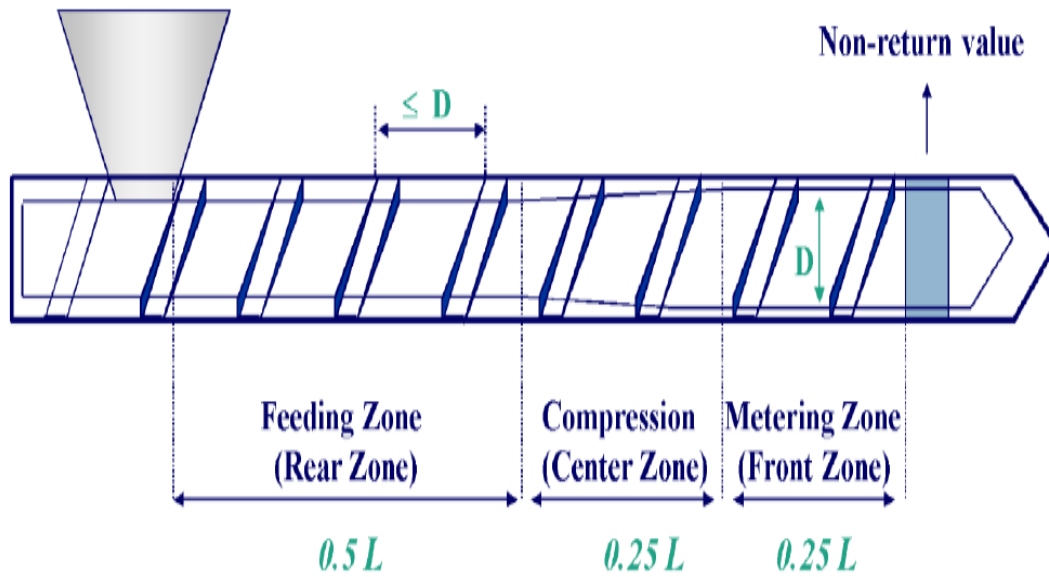


Table 3. Standard molding conditions of KEPITAL NX-10

Classification		Celsius	Fahrenheit
Pre-drying		80 ~ 100 °C (3~4 h)	175 ~ 212 °F (3~4 h)
Cylinder temperature	Feeding part	170 °C	338 °F
	Compression part	190 °C	374 °F
	Metering part	190 ~ 200 °C	374 ~ 392 °F
	Nozzle part	180 ~ 210 °C	356 ~ 410 °F
Mold temperature		60 ~ 80 °C	160 ~ 175 °F

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