Polyacetal (POM)

DURACON®

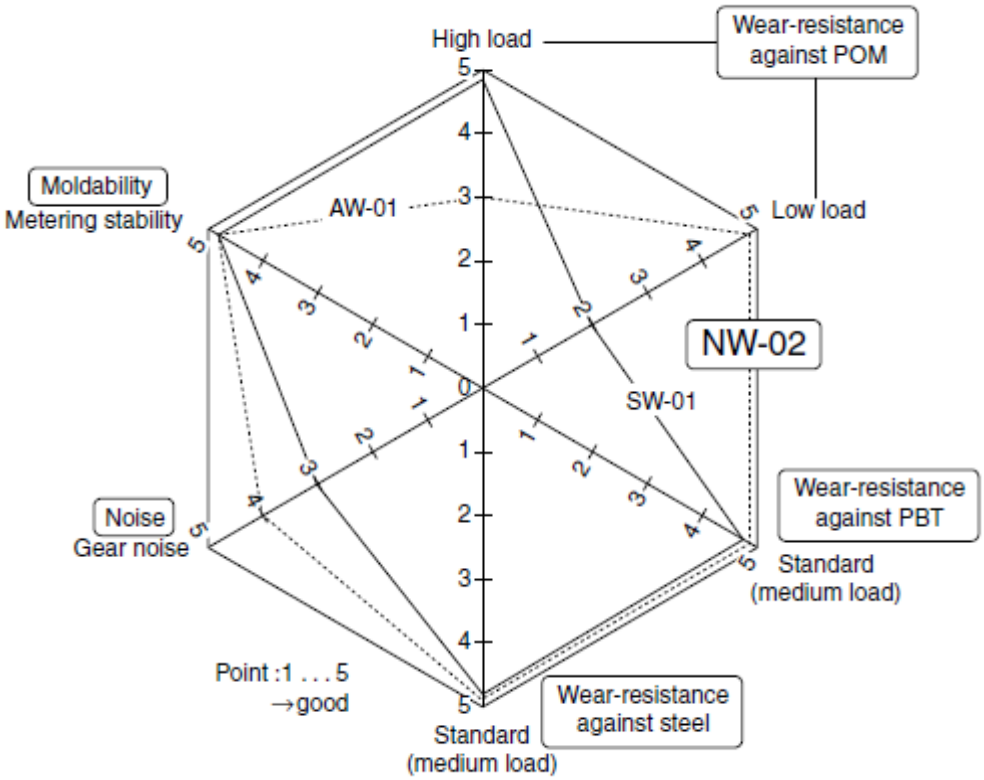
NW-02

CF2001/CD3501

High Sliding

POLYPLASTICS CO., LTD.

The summary chart of DURACON® POM NW-02 characteristics



Introduction

Demands for friction and wear resistance improvements go ever higher standards for DURACON® POM every year. The ultimate goal of these demands is the "greaseless" application. We have developed a wide variety of grades to expand the range of greaseless applications to fully satisfy such a severe demand.

Now we have developed DURACON NW-02, which has both properties of SW-01‘s and AW-01’s for wearing. And NW-02 is one of the most common grade in these area.

Characteristics of DURACON® POM NW-02

Wear-resistant properties

- Stable friction-wear characteristics covering the wide range from low load to high load.
- Stable friction-wear characteriscs over the wide range from low temperature to high temperature.
- Good friction-wear characteristics regardless of the counter materials.
- Low wear noise in gears.
- Superior characteristics over DURACON AW-01 and SW-01.

Processability

- High flowability.
- As good moldability as that of general purpose DURACON.

General Properties of NW-02

table1-1 General Properties（ISO）

Item	Unit	Test Method	High Sliding
			NW-02
			High sliding
Color			CF2001/CD3501
ISO(JIS)quality-of-the-material display:		ISO11469 (JIS K6999)	>POM+PE<
Density	g/cm^3	ISO 1183	1.36
Water absorption (23°C,24hrs,1mmt)	%	ISO 62	0.7
MFR (190℃、2.16kg)	g/10min	ISO 1133	20
MVR (190℃, 2.16kg)	$cm^3/10min$	ISO 1133	18
Tensile strength	MPa	ISO 527-1,2	52
Strain at break	%	ISO 527-1,2	20*1
Tensile modulus	MPa	ISO 527-1,2	2,350
Flexural strength	MPa	ISO 178	72
Flexural modulus	MPa	ISO 178	2,200
Charpy notched impact strength (23℃)	kJ/m^2	ISO 179/1eA	5.9
Temperature of deflection under load (1.8MPa)	℃	ISO 75-1,2	85
Coefficient of linear thermal expansion (23 - 55℃、Flow direction)	$x10^{-5}$/℃	Our standard	12
Coefficient of linear thermal expansion (23 - 55℃、Transverse direction)	$x10^{-5}$/℃	Our standard	12
Electric strength (3mmt)	kV/mm	IEC 60243-1	20
Volume resistivity	Ω·cm	IEC 60093	1×10^{14}
Surface resistivity	Ω	IEC 60093	3×10^{15}
Volume resistivity (Our standard)	Ω·cm		-
Surface resistivity (Our standard)	Ω		-
Mold Shrinkage (60×60×2mmt, Flow direction)	%	ISO 294-4	2.0
Mold Shrinkage (60×60×2mmt, Transverse direction)	%	ISO 294-4	1.8
Rockwell hardness	M(Scale)	ISO2039-2	70
Specific wear amount (Thrust, vs C-Steel, material side, pressure 0.49MPa, 30cm/s)	$x10^{-3}mm^3/(N·km)$	JIS K7218	-
Specific wear amount (Thrust, vs C-Steel, steel side, pressure 0.49MPa, 30cm/s)	$x10^{-3}mm^3/(N·km)$	JIS K7218	-
Coefficient of Dynamic Friction (Thrust, vs C-Steel, pressure 0.49MPa, 30cm/s)		JIS K7218	-
Specific wear amount (Thrust, vs C-Steel, material side, pressure 0.98MPa, 30cm/s)	$x10^{-3}mm^3/(N·km)$	JIS K7218	0.19

Item	Unit	Test Method	High Sliding
			NW-02
			High sliding
Specific wear amount (Thrust, vs C-Steel, steel side, pressure 0.98MPa, 30cm/s)	$x10^{-3}mm^3/(N\cdot km)$	JIS K7218	0.01>
Coefficient of Dynamic Friction (Thrust, vs C-Steel, pressure 0.98MPa, 30cm/s)		JIS K7218	0.17
Specific wear amount (Thrust, vs M90-44, material side, pressure 0.06MPa, 15cm/s)	$x10^{-3}mm^3/(N\cdot km)$	JIS K7218	4.0
Specific wear amount (Thrust, vs M90-44, M90-44 side, pressure 0.06MPa, 15cm/s)	$x10^{-3}mm^3/(N\cdot km)$	JIS K7218	10
Coefficient of Dynamic Friction (Thrust, vs M90-44, pressure0.06MPa, 15cm/s)		JIS K7218	0.32
Flammability		UL94	HB
The yellow card File No.			E45034
Appropriate List number of Ministerial Ordinance for Export Trade Control			Item 16 of Appendix -1

*1) Nominal strain at break

All figures in the table are the typical values of the material and not the minimum values of the material specifications.

1. Wear Resistance of NW-02

1.1 Wear Resistance against POM

At low load under a wide range of temperatures **DURACON® POM NW-02** shows better friction properties than does AW-01 which may increase the functional efficiency in various electro-mechanical parts thus result in saving the power loss.

At medium and high load under a wider range of temperatures, **NW-02** shows much better friction and wear characteristics than dose SW-01 (Fig. 1-1 to Fig. 1-5).

Fig. 1-1 Coeffcient of friction at low load (ASTM friction test)

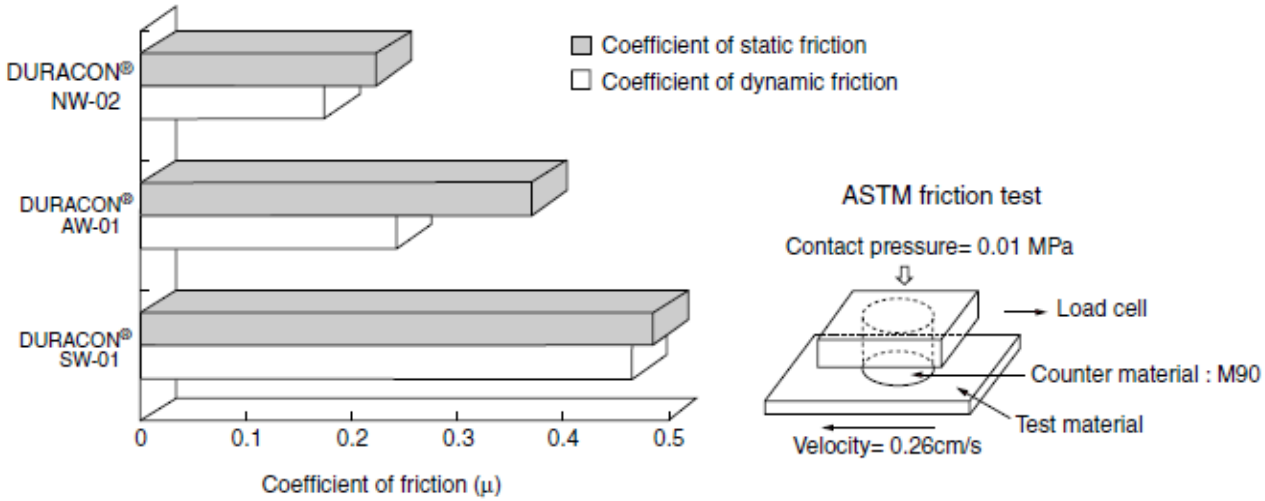


Fig. 1-2 Temperature dependence of coefficient of friction at low load (ASTM friction test)

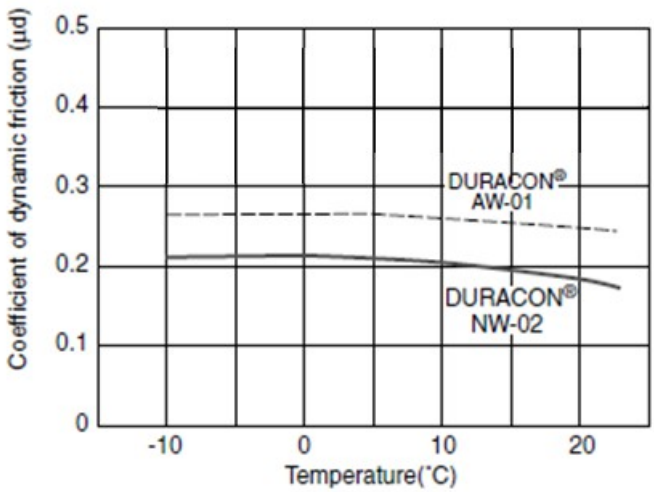


Fig. 1-3 Friction-wear characteristics under load (Suzuki method of wear testing)

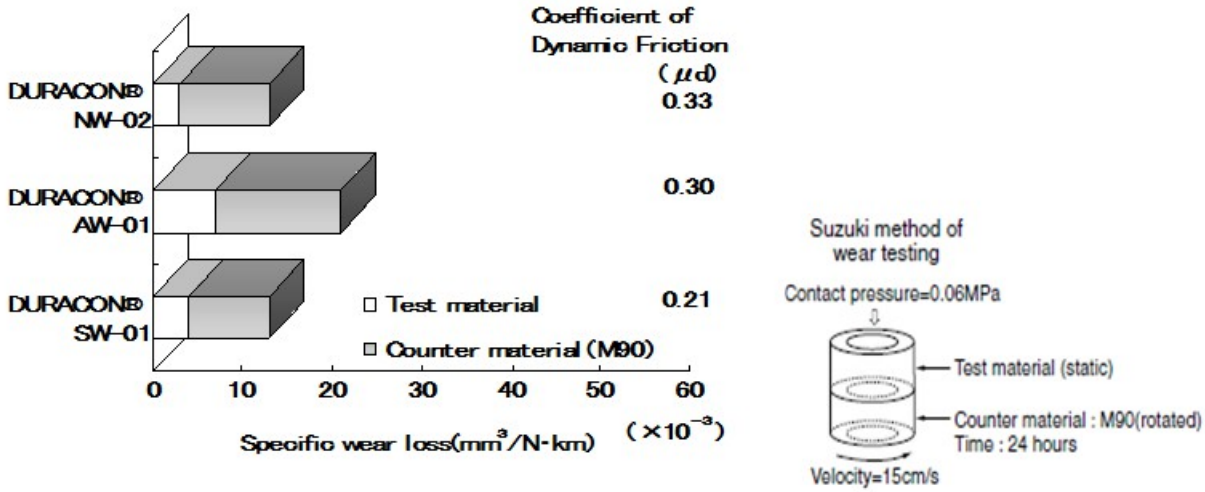


Fig. 1-4 Friction-wear characteristics under medium load at low temperature (-10°C) (Suzuki method)

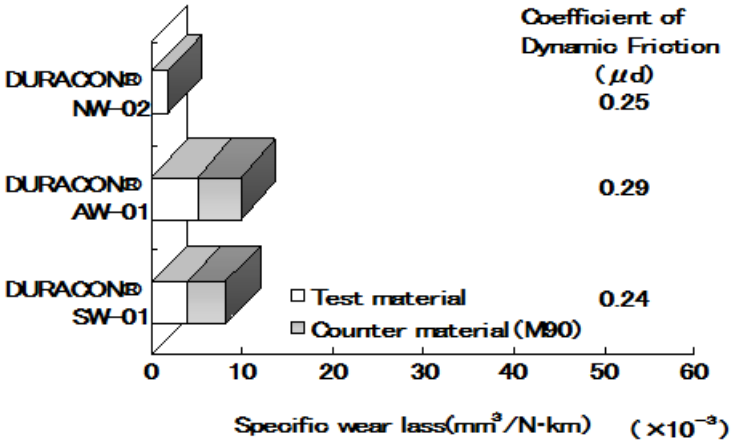
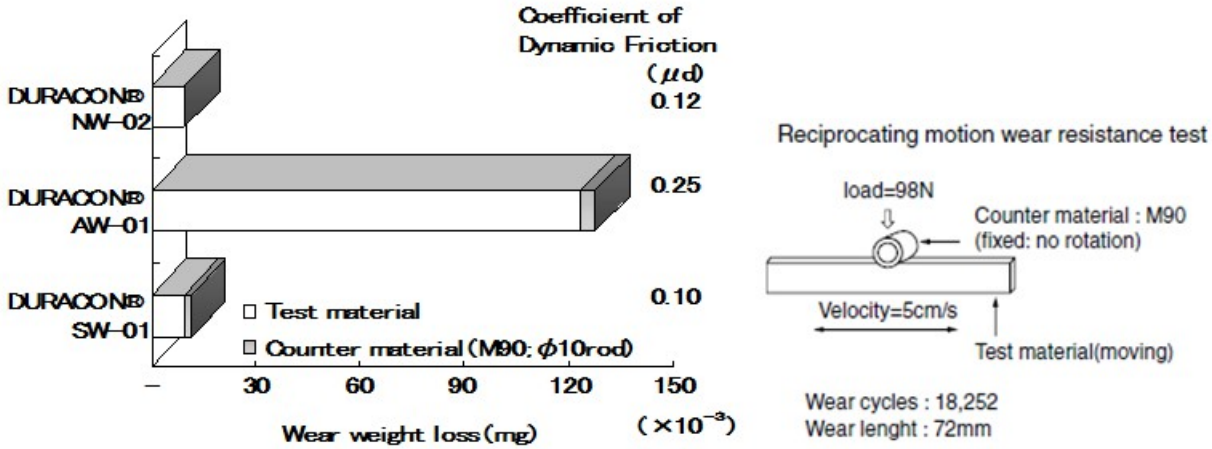


Fig. 1-5 Friction-wear characteristics under high load (reciprocating motion wear test)



1.2 Gear Wear Characteristics (against the same material)

DURACON NW-02 shows good gear wear characteristics under a wide range of conditions and best fits gears as well as other parts in AV/OA applications where various wear properties are required (Fig. 1-6,1-7).

Fig. 1-6 Gear wear characteristics under low load (against the same material)

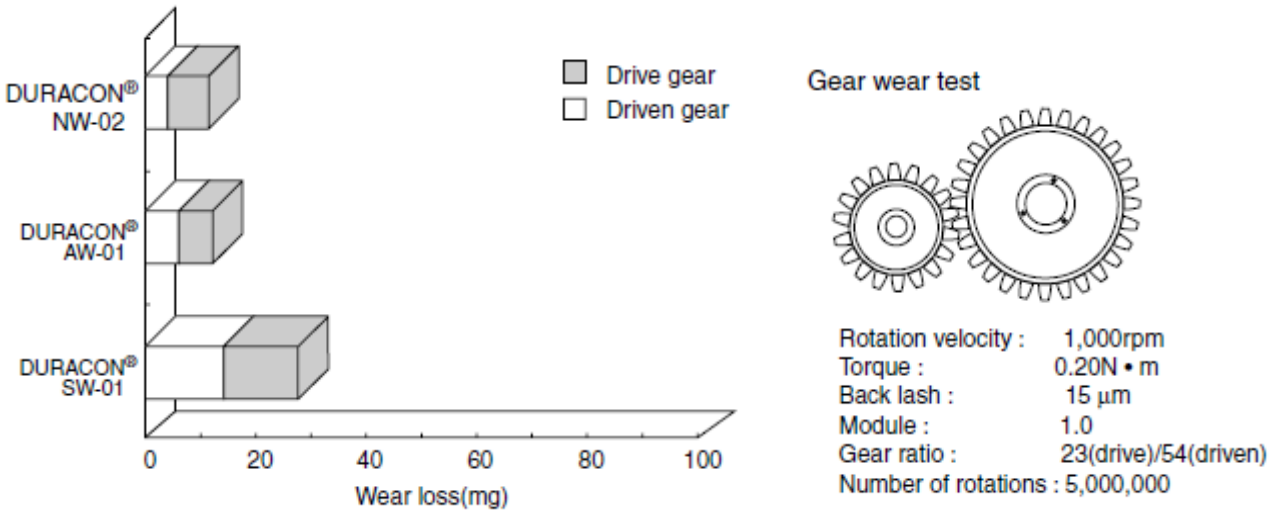
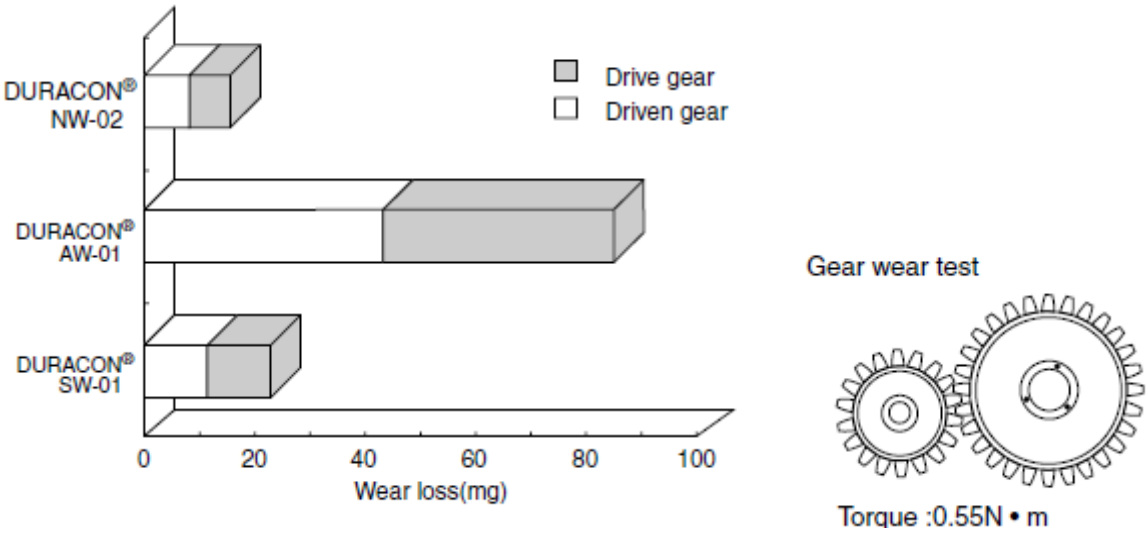


Fig. 1-7 Gear wear characteristics under high load (against the same material)



1.3 Wear Resistance against Steel

DURACON NW-02 shows good property in wear-resistance against metals as well as AW-01 and SW-01 (Fig. 1-8).

1.4 Wear Resistance against PBT

DURACON® POM NW-02 shows good friction-wear resistance against DURANEX® PBT SA series, which are perferablly used for AV/OA chassis applications.
Good characteristics of **NW-02** as the sliding parts against DURANEX 751SA slider or boss on the chassis are illustrated in Fig. 1-9.

Fig. 1-8 Friction-wear characteristics against steel (Suzuki method)

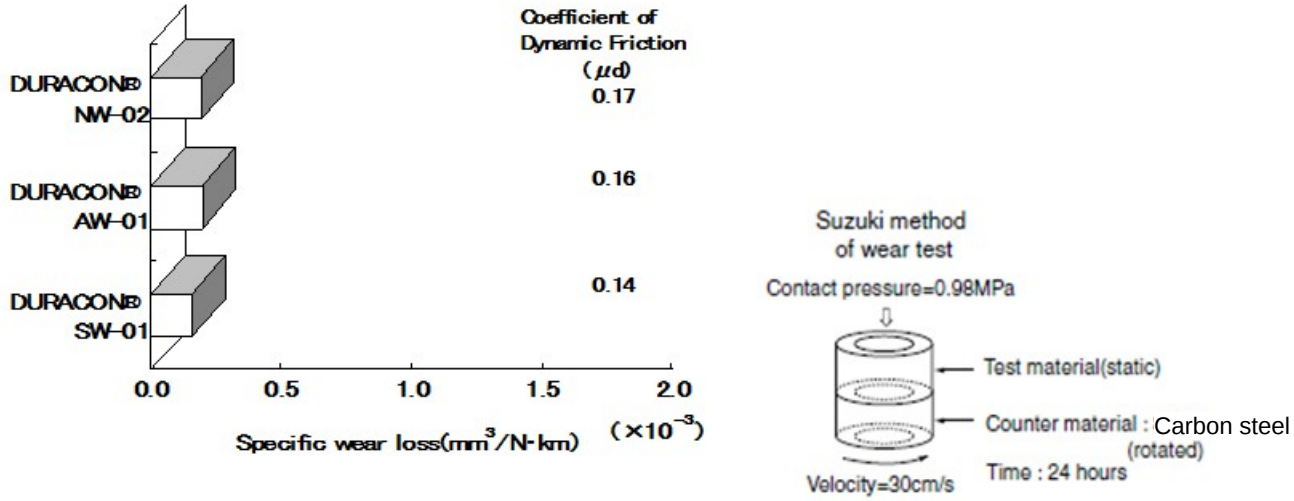
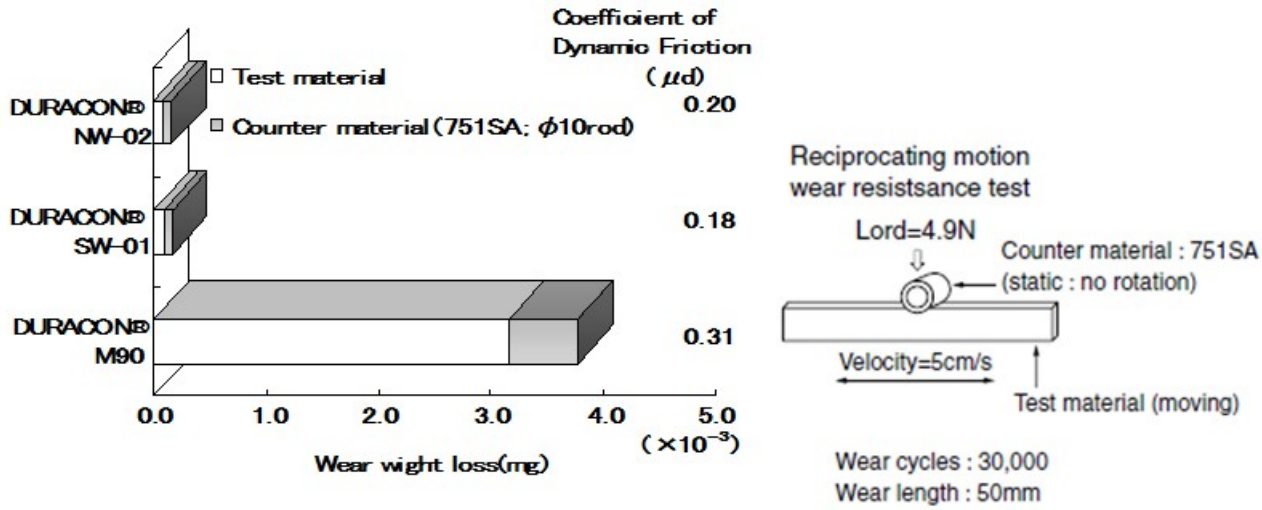


Fig. 1-9 Friction-wear characteristics against PBT (DURANEX® PBT 751SA) (reciprocating motion)



2. Noise Characteristics of NW-02

2.1 Wear Noise

DURACON NW-02, like SW-01, generates little squeaking noise even under high contact pressure friction and also reduces gear noise, thus use of **NW-02** in frictional parts makes the operations comfortablly quiet (Fig. 2-1, 2-2).

Fig. 2-1 Sqeaking noise generation behavior

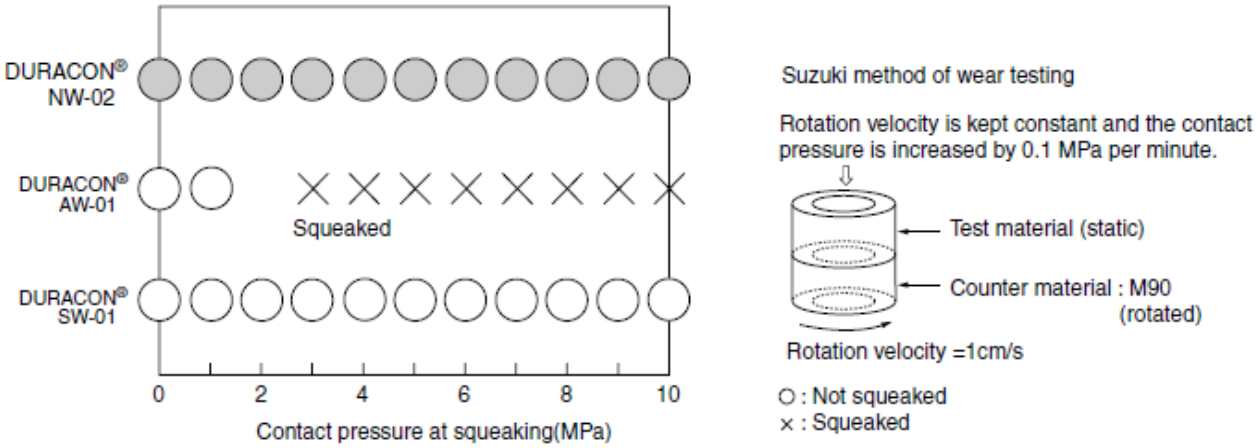
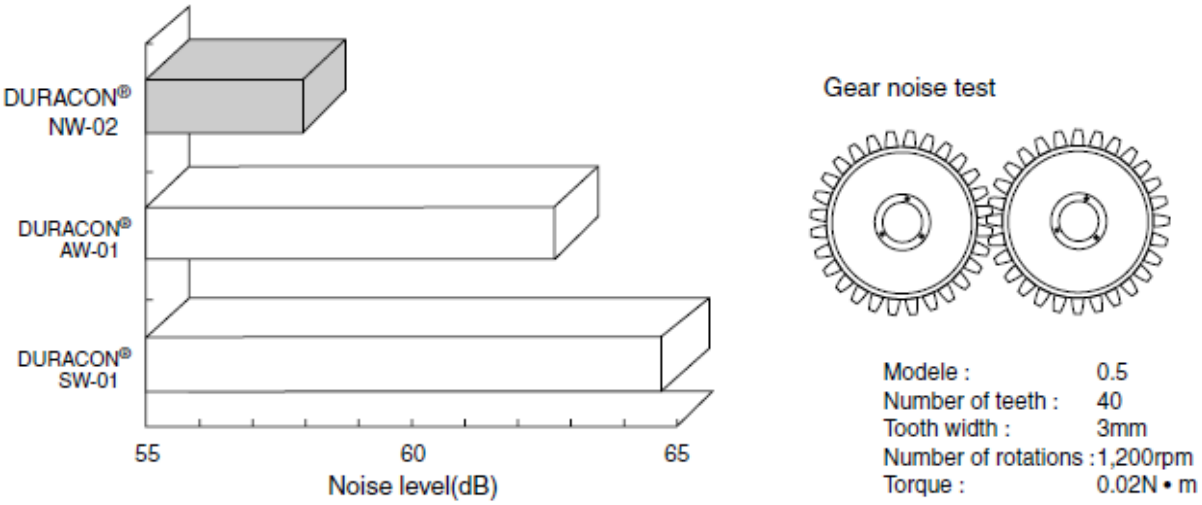


Fig. 2-2 Gear noise (high velocity/low torque)

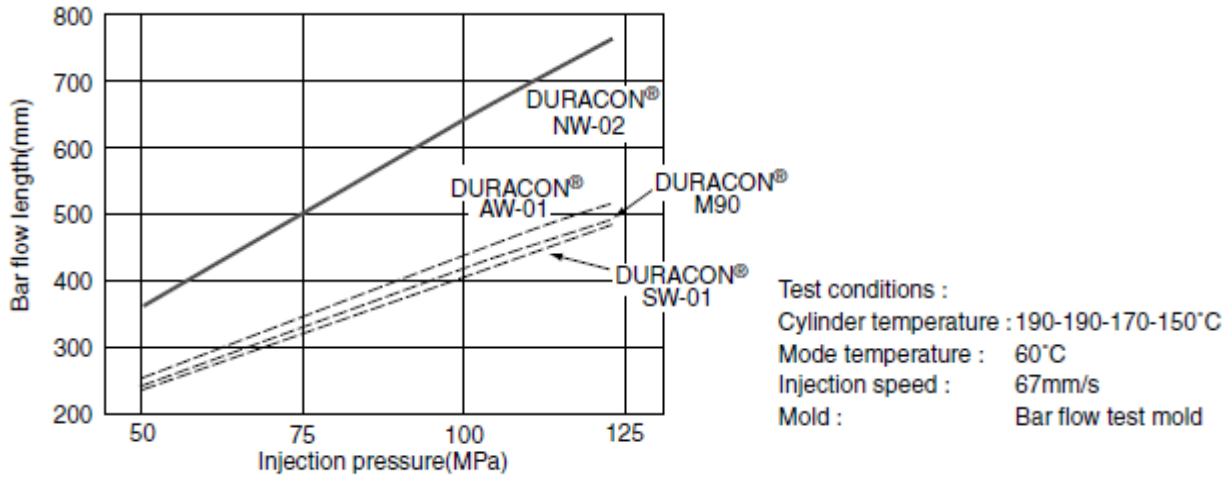


3. Processability of NW-02

3.1 Processability

DURACON NW-02 exhits higher flowability than do the conventional wear-resistant grades, which may result in higher productivity and higher dimensional accuracy in molding (Fig. 3-1).

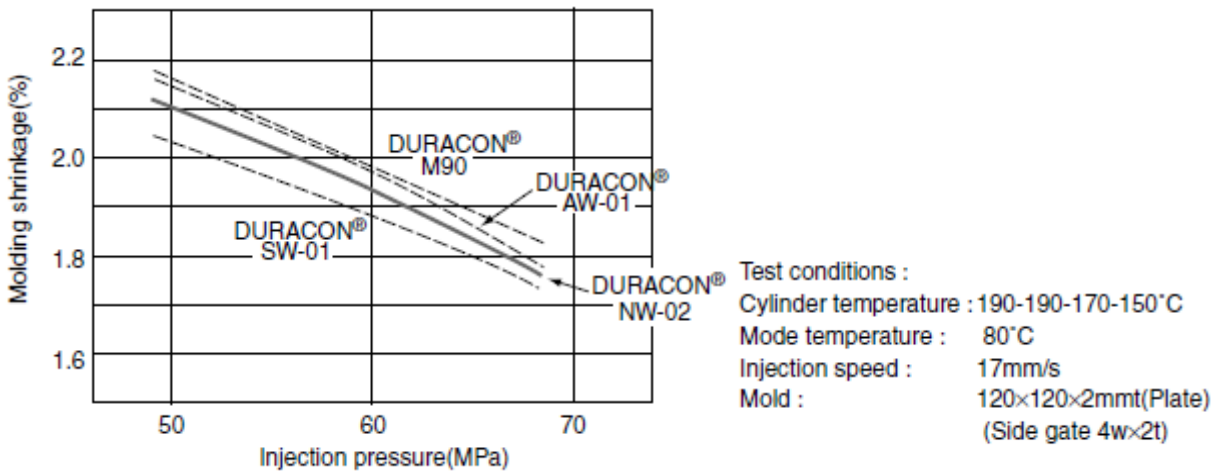
Fig. 3-1 Bar flow length (2mmt)



3.2 Molding Shrinkage

DURACON NW-02 shows molding shrinkage approximately the same as that of AW-01 or SW-01 (Fig. 3-2).

Fig. 3-2 Molding shrinkage (2mmt)



3.3 Metering Characteristics

DURACON NW-02 features metering characteristics (screw feeding characteristics) as good as those of AW-01 or SW-01 and is free from poor metering that the silicon-added materials often encounter while molding operation.

3.4 Other Processing Characteristics

Less mold deposit,which tends to occur during molding of the modified polyacetal,is expected for **DURACON NW-02** than for the conventional grades.

Polyplastics

NOTES TO USERS

- All property values shown in this brochure are the typical values obtained under conditions prescribed by applicable standards and test methods.
- This brochure has been prepared based on our own experiences and laboratory test data, and therefore all data shown here are not always applicable to parts used under different conditions. We do not guarantee that these data are directly applicable to the application conditions of users and we ask each user to make his own decision on the application.
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