



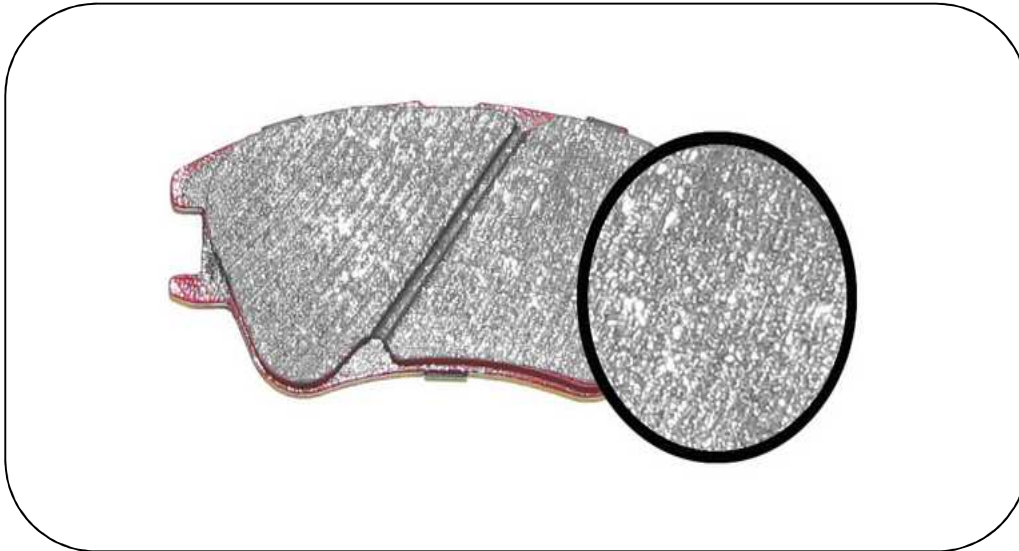
## Metallic Carbon Plus Brake Pads Profile

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## Perfil de las Pastillas Metallica Carbon Plus



## Characteristics



Friction Coefficient FF  
 Coeficiente de Fricción FF

Low Fade  
 Bajo desvanecimiento

Flash Mold Production  
 Producción por molde rápido

Excelent Stopping Power  
 Excelente Potencia de frenado

Materials: - Carbon Elements  
 - Inorganic Fiber, Kevlar  
 - Resin

Long Life  
 Larga duración

Materiales: - Elementos de Carbón  
 - Fibras Inorgánicas, Kevlar  
 - Resin

Low Dust  
 Bajo Polvo



## Physical Properties

### a. Physical Properties

#### Density

	Temperature [°C]	Operation	Remarks
1	R.T.	Weight	In Air
2	R.T.	Weight	In Water

#### Hardness

	Scale	Rockwell	Penetrator Diameter,mm	Standards Loading [N]	Test Loading [N]
1	R	HRR	12.7	98.07	588.4

#### pH Value

	Scale	pH Value (Buffer Solution)	Soak Solution
1	0.00~14.00	4.00,6.86,9.18	KCl(aq.3mol/L)

#### Shear Strength

	Positive Pressure [MPa]	Shear Force [KN]	Loading Ratio [N/s]	Power [KW]
1	0-0.5	0-100	4500±500	1.5

#### Porosity

	Temperature [°C]	Time [hr]	Remarks
1	90±10	8	In Oil
2	90±10→R.T.	Over 12	In Oil

#### Impact Strength

	Impact Speed [m/s]	Impact Power [J]	Impact Angel [°]	Sample size [mm]
1	2.9	0.5	150	55*10*6

# Physical Properties

## b. Physical Properties

Density (g/cm <sup>3</sup> )	2.95~3.05	Hardness/HRR	105~115
pH Value	7.50~8.20	Shear (N/mm <sup>2</sup> )	>5.0
Porosity/%	2.50~3.00	Impact (KJ/m <sup>2</sup> )	1.130~1.450

## Compressibility

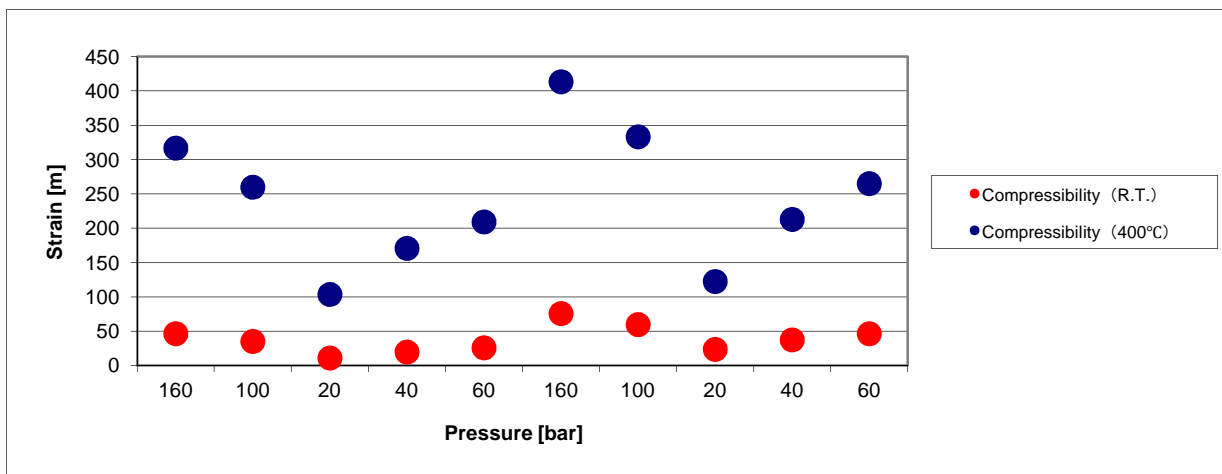
	Load Increment Ratio [Mpa/sec]	Initial Loading [Mpa]	Test Loading [Mpa]	Cycle
1	8±1	0.5	2~16	3

## Compressibility (R.T.)

Load/bar	160	100	20	40	60	160	100	20	40	60
Cycle	3↓	3↑	3↑	3↑	3↑	1↓	1↑	1↑	1↑	1↑
Mean Value	[μm] 46.6	[μm] 35.3	[μm] 11.1	[μm] 19.8	[μm] 26	[μm] 75.8	[μm] 59.8	[μm] 23.7	[μm] 37.5	[μm] 46.5

## Compressibility (400°C)

Load/bar	160	100	20	40	60	160	100	20	40	60
Cycle	2↓	2↑	2↑	2↑	2↑	1↓	1↑	1↑	1↑	1↑
Mean Value	[μm] 316.8	[μm] 259.9	[μm] 103.7	[μm] 170.8	[μm] 209.4	[μm] 413.6	[μm] 333.4	[μm] 122.6	[μm] 213.1	[μm] 265.1

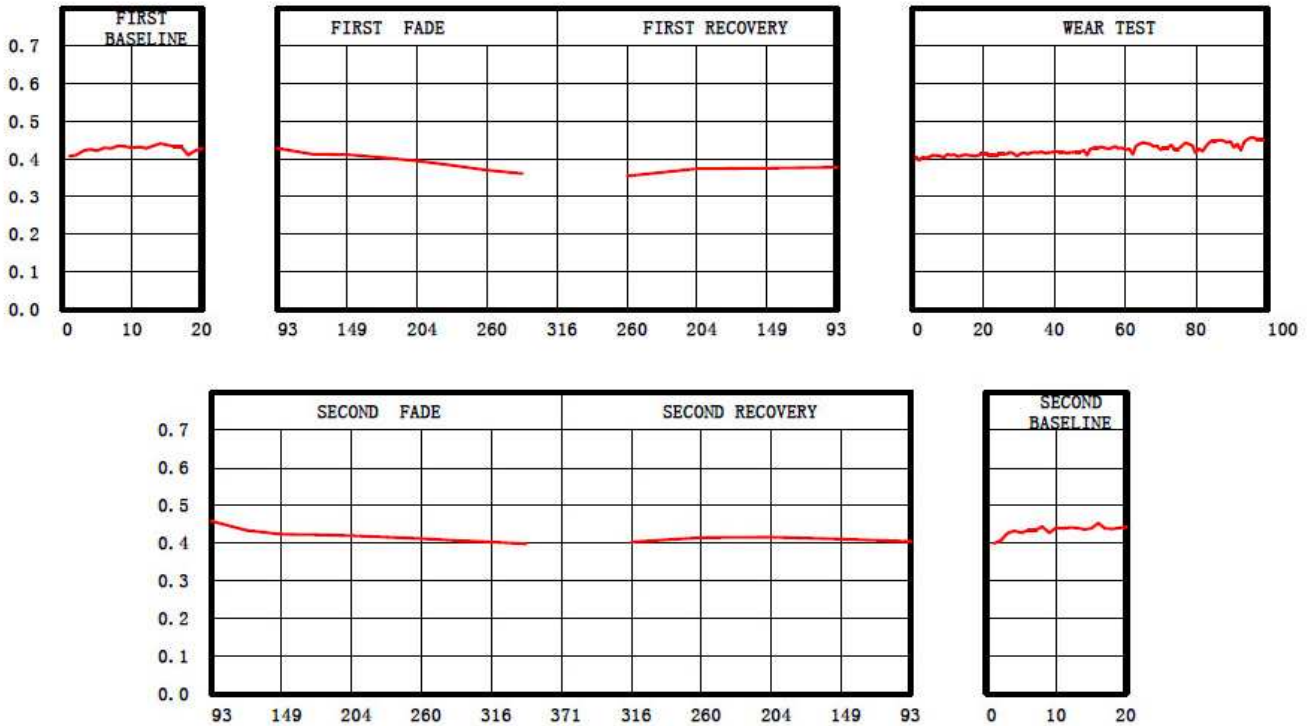


# SAE J-661 Chase Test

## a. Friction and wear

	Before Test	After Test	Loss	Loss%
Mass (g)	13.13	12.96	0.17	1.29%
Thickniss (mm)	6.74	6.69	0.05	0.74%
$\mu$	normal	0.414	hot	0.404%

### HY206 SAE J661 FRICTION MATERIAL TEST REPORT



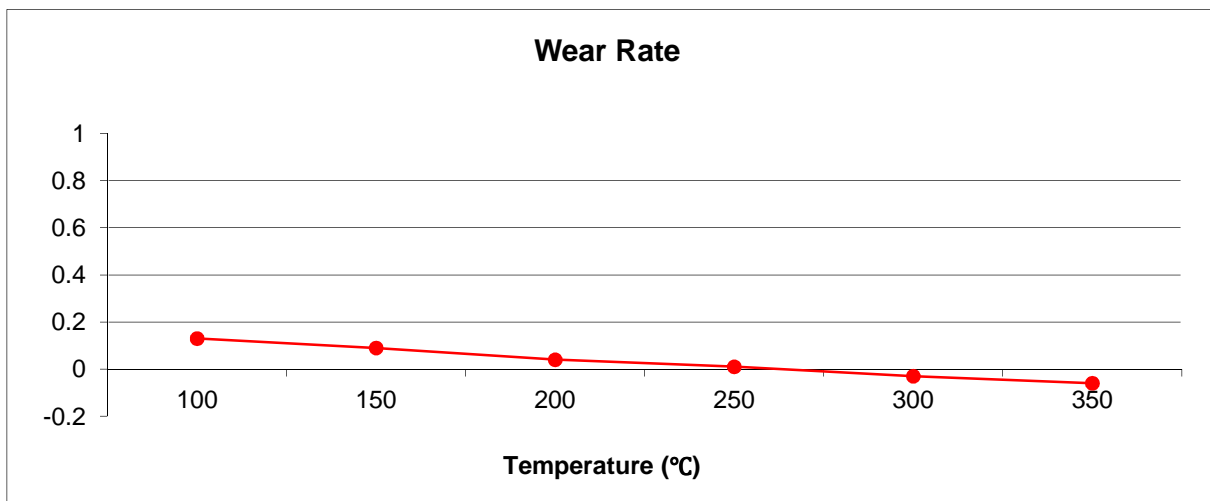
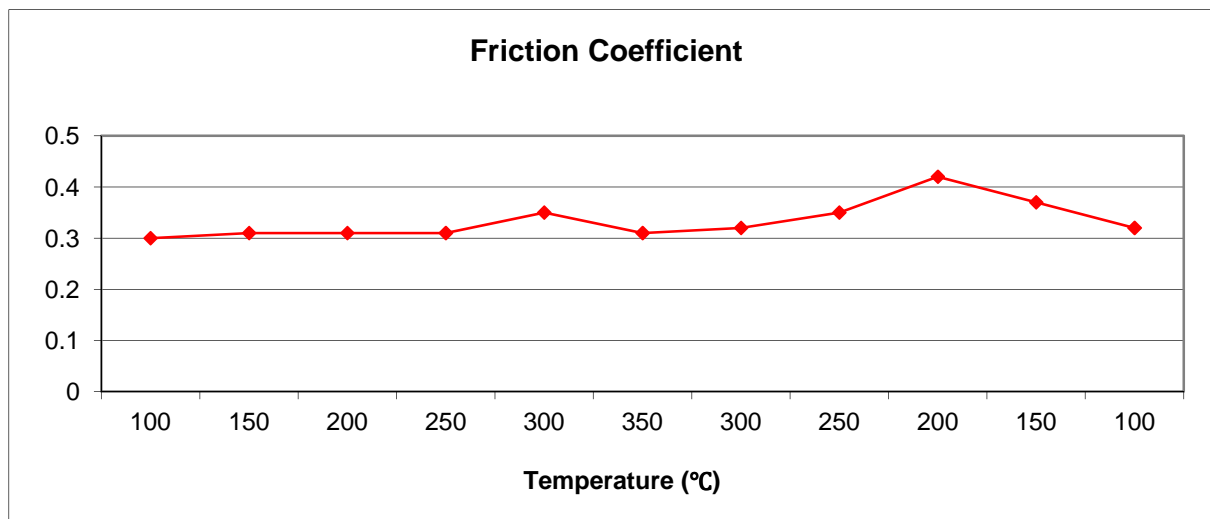
## Friction and Wear - Constant Speed

### b. Friction and wear


Equipment Name: Constant speed tester

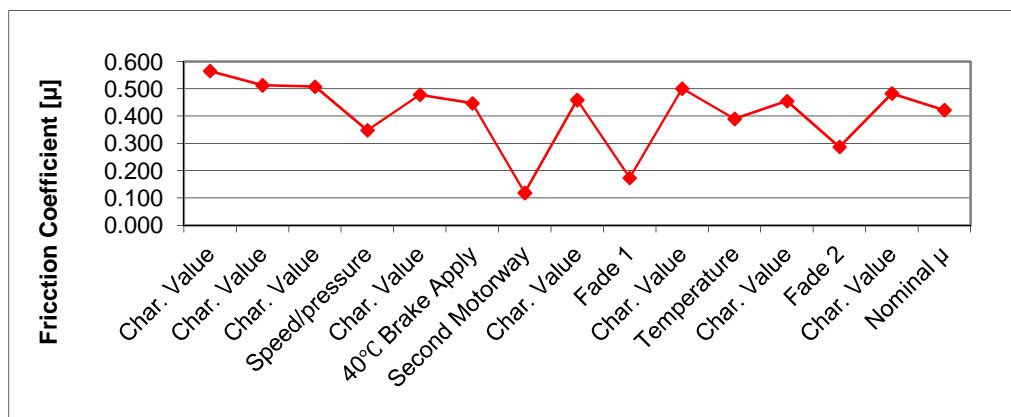
Standard Applied: GB5763-2008

Test Temperature (°C)	Friction Coefficient	Coefficient appointed	Wear Rate 10-7cm <sup>3</sup> /(N·m)	Test Temperature (°C)	Friction Coefficient		Wear Rate 10-7cm <sup>3</sup> /(N·m)
					Warming	Cooling	
100	0.25-0.65	0.35±0.08	0-0.50	100	0.30	0.32	0.13
150	0.25-0.70	0.35±0.10	0-0.70	150	0.31	0.35	0.09
200	0.25-0.70	0.35±0.10	0-1.00	200	0.31	0.42	0.04
250	0.25-0.70	0.35±0.10	0-1.50	250	0.31	0.37	0.01
300	0.25-0.70	0.35±0.12	0-2.00	300	0.35	0.32	-0.03
350	0.25-0.70	0.35±0.12	0-2.50	350	0.31		-0.06



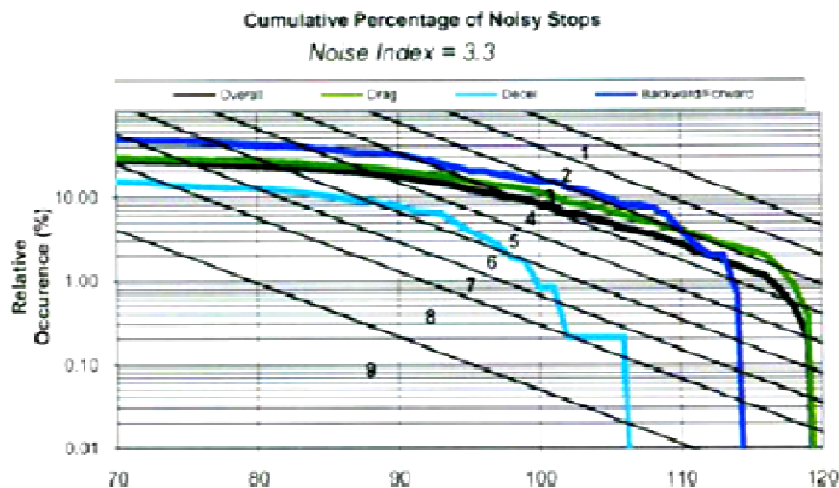
# SAE J-2522 DYNAMOMETER BRAKE EFFECTIVENESS

<b>Vehicle</b>	<b>Sample Model</b>		D787-7656	
	Engine Size		2.4	
	Required Load		942 Kg	
	Required Inertia		111.8 Kg·m2	
	Piston Diameter		56.6 mm	
	Effective Radius		112.0 mm	
<b>Dynamometer Brake</b>				
<b>Characteristic Values <math>\mu</math></b>			AVG	MIN
Char. Value	(6.1)	$\mu_{avg}$	0.565	
Char. Value	(6.2)	$\mu_{avg}$	0.513	
Char. Value	(6.3)	$\mu_{0p6}$	0.508	
Speed/pressure	(6.4.3)	$\mu_{v120}$	0.348	
Char. Value	(6.5)	$\mu_{0P6}$	0.478	
40°C Brake Apply	(6.6)	$\mu_{T40}$	0.447	
Second Motorway	(6.7)	$\mu_{Mw2}$	0.119	
Char. Value	(6.8)	$\mu_{0P18}$	0.459	
Fade 1	(6.9)	$\mu_{F1}$		0.174
Char. Value	(6.10)	$\mu_{0P18}$	0.501	
Temperature	(6.12)	T500/ $\mu_{T300}$		0.390
Char. Value	(6.13)	$\mu_{0P18}$	0.455	
Fade 2	(6.14)	$\mu_{F2}$		0.287
Char. Value	(6.15)	$\mu_{0P18}$	0.483	
Nominal $\mu$		$\mu_{avg}$	0.422	



## SAE J-2521 Noise Performance

**Fixture Identification:** D787-7656  
**Required Wheel Load:** 528.5 Kg  
**Actual Wheel Load:** 528.5 Kg  
**Required Inertia:** 55.2 Kg·m2  
**Actual Inertia:** 55.0 Kg·m2  
**Pri/Lead/Inner Lining:** XBP 2701 FF  
**Sec/Trail/Outer Lining:** XBP 2701 FF  
**Comments:** With Normal shim No Knuckle



Frequency Range	Threshold	Number of Noisy Stops (per frequency range / apply type)				Percentage (%) Noisy Stops (per frequency range / apply type)			
		Overall	Drag	Decel	Back/Fwd	Overall	Drag	Decel	Back/Fwd
2 kHz to 17 kHz	>70 dB(A)	381	235	74	72	26.6%	29.4%	15.4%	48.0%
	>80 dB(A)	331	209	60	62	23.1%	26.2%	12.4%	41.3%
2 kHz to 4 kHz	>70 dB(A)	55	35	6	14	3.8%	4.4%	1.2%	9.3%
	>80 dB(A)	30	18	1	11	2.1%	2.3%	0.2%	7.3%
4 kHz to 6 kHz	>70 dB(A)	35	29	0	6	2.4%	3.6%	0.0%	4.0%
	>80 dB(A)	20	17	0	3	1.4%	2.1%	0.0%	2.0%
6 kHz to 10 kHz	>70 dB(A)	348	217	70	61	24.3%	27.2%	14.5%	40.7%
	>80 dB(A)	291	183	59	49	20.3%	22.9%	12.2%	32.7%
10 kHz to 14 kHz	>70 dB(A)	86	62	3	21	6.0%	7.8%	0.6%	14.0%
	>80 dB(A)	44	35	1	8	3.1%	4.4%	0.2%	5.3%
14 kHz to 17 kHz	>70 dB(A)	182	123	22	37	12.7%	15.4%	4.6%	24.7%
	>80 dB(A)	125	91	7	27	8.7%	11.4%	1.5%	18.0%
		<b>Total # of Stops</b>				<b>1430</b>	<b>798</b>	<b>482</b>	<b>150</b>

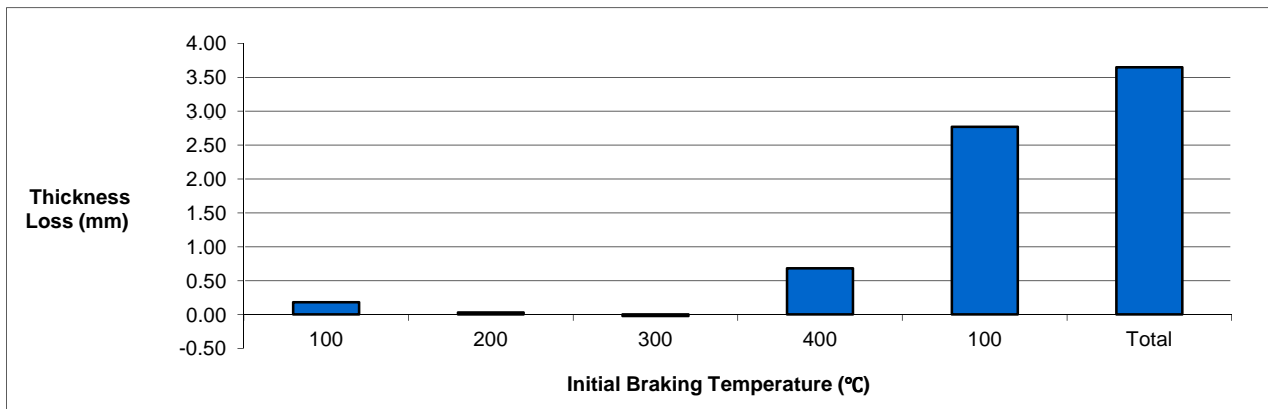


## SAE J-2521 Noise Performance

Applied Standar	Appended Table 1 List of Test Items				Remark
	initial speed	Initial brake temperature °C	Braking deceleration G	Number of applications	
JASO C427	50	100	0.3	500	Measure the thickness of pads for each specified temperature in parentheses are optional.
	50	200	0.3	500	
	50	300	0.3	500	
	50	400	0.3	500	
	100	100	0.3	500	

### Thicknees Loss

Fixture	100	200	300	400	100	Total
<b>D787-7656</b>	0.18	0.03	-0.02	0.68	2.77	3.65



### Weight Loss

Fixture	100	200	300	400	100	Total
<b>D787-7656</b>	3.75	0.75	2.75	15.75	43.50	66.50

