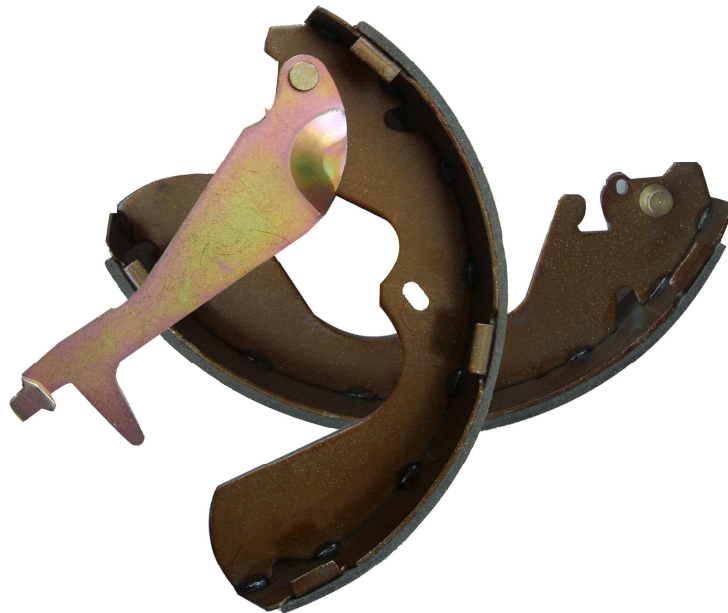




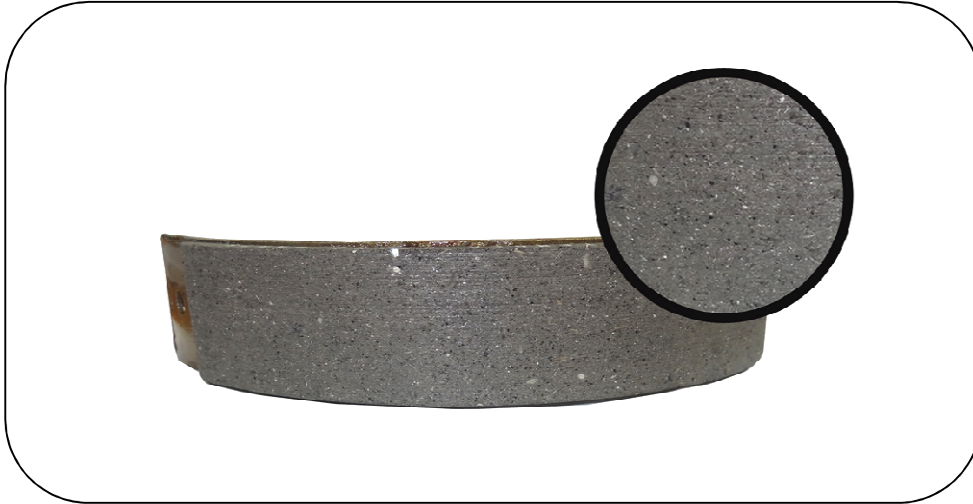
## **Metallic Brake Shoes Profile**

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## **Perfil de las Zapatas Metálicas**



## Characteristics



**Friction Coefficient GG**  
**Coeficiente de Fricción GG**

**Low Fade**  
**Bajo Desvanecimiento**

**Bonded and Riveted Production**  
**Producción Remachada y Vulcanizadas**

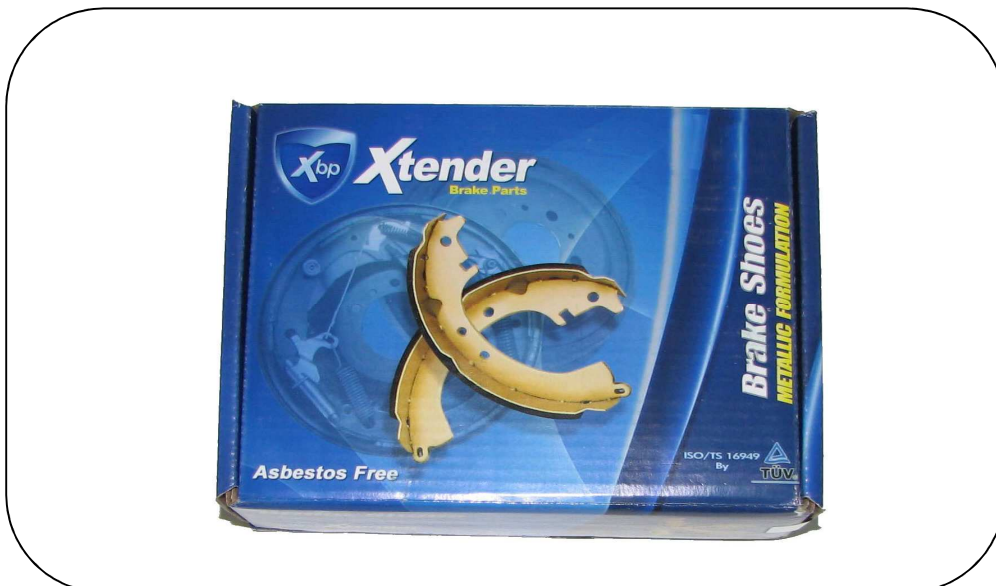
**Excelent Stopping Power**  
**Excelente Potencia de Frenado**

**Materials:**

- Resin
- Steel, Glass, Kevlar Fibers
- Petroleum Coke
- Graphite
- Barium Sulfate
- Alumina

**Materiales:**

- Resina
- Fibras de Hierro, Vidrio y Kevlar
- Coque de Petróleo
- Grafito
- Sulfato de Bario
- Alumina



## 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.mol/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> )	2.98	Hardness/HRR	64
pH Value	7.48	shear	7.3
Porosity/%	6.01	impact	2.073

## Compressibility

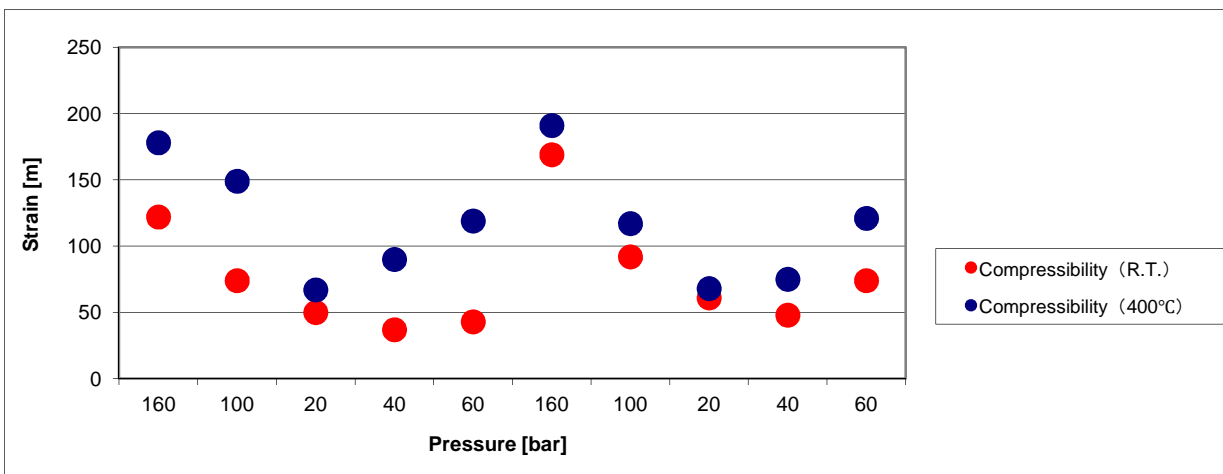
	Load Increment Ratio [Mpa/sec]	Initial Loading [Mpa]	Test Loading [Mpa]	Cycle
1	8±1	0.5	2--16	3

## 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] 122.0	[μm] 74.0	[μm] 50.0	[μm] 37.0	[μm] 43.0	[μm] 169.0	[μm] 92.0	[μm] 61.0	[μm] 48.0	[μm] 74.0

## 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] 178	[μm] 149	[μm] 67	[μm] 90	[μm] 119	[μm] 191	[μm] 117	[μm] 68	[μm] 75	[μm] 121







# SAE J-661 Chase Test

Report 166315  
International Motor Products, Inc.  
Page 2 of 3

## VEHICLE EQUIPMENT SAFETY COMMISSION (VESC) REGULATION V-3 DATA SHEET

Identification Markings: XBP 1-GG

Test No. Test Date	FRICTION COEFFICIENT ( $\mu$ )					Average	Maximum Variation Below Average
	M22-514-01 23 Apr 16	M22-514-02 23 Apr 16	M22-514-20 27 Apr 16	M22-514-21 28 Apr 16	M22-514-22 28 Apr 16		
<b>First Baseline Run</b>							
Appl. No.							
1	0.51	0.54	0.55	0.57	0.55	0.544	
20	0.58	0.58	0.59	0.57	0.58	0.580	
<b>First Fade Run</b>							
Temp. (°F)							
200	0.59	0.59	0.60	0.58	0.59	0.590	
550	0.53	0.50	0.53	0.53	0.50	0.518	
Min at 550°F °F at 10 min	4.1	4.4	4.0	4.0	4.3		
	--	--	--	--	--		
<b>First Recovery Run</b>							
Temp. (°F)							
500	0.56	0.53	0.56	0.57	0.55	0.554	
400	0.56	0.54	0.55	0.56	0.56	H 0.554	
300	0.54	0.54	0.53	0.55	0.55	H 0.542	
200	0.55	0.54	0.53	0.54	0.52	0.536	
<b>Wear Run</b>							
Appl. No.							
1	0.54	0.52	0.53	0.54	0.53	0.532	
100	0.53	0.52	0.53	0.53	0.51	0.524	
<b>Second Fade Run</b>							
Temp. (°F)							
200	* 0.48	* 0.48	* 0.48	* 0.48	* 0.48	N 0.480	0.000
250	* 0.52	* 0.51	* 0.52	* 0.51	* 0.51	N 0.514	0.004
300	* 0.51	* 0.52	* 0.54	* 0.52	* 0.51	N 0.520	0.010
400	* 0.52	* 0.52	* 0.55	* 0.52	* 0.52	N 0.526	0.006
450	* 0.52	* 0.53	* 0.55	* 0.52	* 0.52	H 0.528	0.008
500	* 0.54	* 0.53	* 0.56	* 0.52	* 0.53	H 0.536	0.016
550	* 0.53	* 0.52	* 0.55	* 0.52	* 0.53	H 0.530	0.010
600	0.51	0.50	0.55	0.51	0.50	H 0.514	
650	0.50	0.47	0.53	0.49	0.47	H 0.492	
Min at 650°F °F at 10 min	5.5	5.9	5.3	5.6	5.7		
	--	--	--	--	--		
<b>Second Recovery Run</b>							
Temp. (°F)							
600	0.56	0.54	0.58	0.55	0.53	0.552	
500	0.57	0.54	0.60	0.55	0.54	H 0.560	
400	0.52	0.52	0.55	0.51	0.50	H 0.520	
300	* 0.51	* 0.51	* 0.52	* 0.51	* 0.50	H 0.510	0.010
200	* 0.50	* 0.50	* 0.51	* 0.49	* 0.49	0.498	0.008
<b>Second Baseline Run</b>							
Appl. No.							
1	0.53	0.52	0.52	0.51	0.50	0.516	
20	0.53	0.55	0.55	0.54	0.53	0.540	

# SAE J-661 Chase Test

Report 166315  
 International Motor Products, Inc.  
 Page 3 of 3

## VEHICLE EQUIPMENT SAFETY COMMISSION (VESC) REGULATION V-3 AVERAGE DATA GRAPH

Identification Markings: XBP 1-GG

