Powder Phenolic Resins in the Friction Industry

The Benefits of SG-3378 in Friction

Powder phenolic resins are commonly utilized as the primary binder in most friction linings, pads, or elements. By taking advantage of the phenolic resin technology, the formulator can manipulate the final properties of a friction element.
Epoxy-modified phenolic powder resin brings some unique features to friction elements, contributed to the intrinsic characteristics of epoxy resin. The following list are some benefits:

- Improved toughness
- Superior adhesion to glass/steel fiber
- Shorter stopping distance
- Improved static moment
- Higher compressibility
- Higher friction coefficient

The epoxy-modified powder phenolic resin, SG-3378, can assist with formulating brake pads with a short stopping distance. SG-3378 is ideal for use in disc pads for light vehicles, SUVs, 4x4s, and racing cars. It can also be used in the formulation of railway shoes for heavy axle load.

SG-3378 Characteristics

SG-3378 portrays a combination of characteristics provided by phenolic resin and epoxy resin, including improved flexural strength/toughness and a “softer” binder matrix while retaining high heat resistance.

SG-3378 Properties

SG-3378 powder has a medium flow, medium hexamine level, fine particle size and medium cure rate.

Grade	Flow	Hexamine	Cure Time 160°C
SG-3378	27-32 mm	8.8-9.2 %	20-40 Sec

This resin must be stored away from heat sources and moisture.

SG-3378 Degradation Temperature Data

Starting degradation temperature	200°C
10% Weight loss temperature	454°C
30% Weight loss temperature	550°C

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Formulatory Guidelines

SG-3378 is ideal for use in, but not limited to

- Disc brake pads for light vehicles
- Disc brake pads for high speed cars
- Heavy-freight rail brake blocks
- Tractor brake linings

SG-3378 can also be used in conjunction with

- SG-3130 unmodified powder in disc brake pads, heavy-freight rail blocks, or tractor linings
- Phosphorous-modified phenolic powder resin in disc brake pads for racing cars

Starting Formulations

The following starting formulations are shown expressly for the purpose of demonstrating the broad formulatory approaches that apply, and are not adapted for commercial production.

Semi-Metallic Disc Brake Pad for 4x4

	Parts by Weight
Kevlar	0.3
Graphite	10
Coke	8
Antimony trisulphide	8
Magnesium oxide	0.8
Friction dust	5
Nitrile rubber powder	3
Barytes	13
Calcium carbonate	5.9
Mica	6
Copper powder	2
SG-3378	**10**
Steel fiber	28

Metallic Disc Brake Pad for SUV

	Parts by Weight
Steel fibers	30
Iron powder	20
Graphite	15
Barytes	21.5
Friction dust	5
SG-3378	**8.5**

Tractor Brake Lining

	Parts by Weight
Glass fiber	3.5
Steel fiber	9
Calcium carbonate	13
Barytes	10
Brass powder	3
Zinc oxide	1
Antimony trisulphide	3
Calcined alumina	4
Friction dust	4
Wollastonite	10
Graphite	6
Recycled rubber	3
Nitrile rubber powder	4
SG-3378	**16.5**
Carbon black	2
Kevlar	5
Mineral wool	10

What this means for you

ASK Chemicals' SG-3378 offers unique benefits as the binder in disc brake pads, rigid brake linings, and heavy-freight rail blocks. If friction elements with ashorter stopping distance and greater transverse strength are required, it can be achieved with SG-3378. Please contact your ASK Chemicals sales representative for additional information regarding SG-3378.

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