

COMPÔ

INDUSTRIAL FRICTION SHEETS



**HINDUSTAN
COMPOSITES
LIMITED**

WHERE SAFETY IS AN ONGOING CONCERN

FRICION SHEET COMP^o WAS – 80

COMP^o WAS-80 is a clutch facing material having a non – metallic woven asbestos base impregnated with an infusible bond which gives it good durability and resistance to fade. It possesses a medium coefficient of friction and is capable of satisfactory performance under reasonably high clutch temperatures.

It is recommended for general engineering requirements where exigencies of exceptional flange width or other dimensions force the adoption of facings in two or more segments. It is intended for use under dry conditions of operations. It is available in flat sheet form.



APPLICATIONS INDUSTRIAL CLUTCHES:

General engineering application. Tractor main engine clutches.

TECHNICAL DATA:

Friction
 μ for design purpose : 0.30 (Dry)

PHYSICAL PROPERTIES(NOMINAL):

Data based on standard test methods.

Ultimate Tensile strength : 280 kg/cm²
 Ultimate shear strength : 360 kg/cm²
 Ultimate compressive strength : 1547 kg/cm²
 Rivet holding capacity : 1200 kg/cm²
 (load to failure on rivet lead hole projected area).
 Specific gravity : 1.6

CLUTCH DESIGN:

The applied load in a clutch is not transmitted as efficiently as in a brake and the full effective torque radius is not always developed. It is usual, therefore, to use a lower design friction value for a clutch than for a brake with similar torque characteristics. The coefficient of friction for design should be based upon severity of the application and the maximum anticipated operating temperature. Normal engineering practice should be followed in applying an appropriate safety factor to the torque requirements of the unit.

RECOMMENDED OPERATING TEMPERATURES:

Maximum temperature : 350°C
 Maximum continuous temperature : 125°C

NOTE:

It is possible to exceed the recommended maximum continuous temperature in commensurate with a reasonable rate of wear.

RECOMMENDED MATING SURFACE:

- Good quality close grain or alloy cast-iron.
- If steel, then forged or cold rolled with a Brinell hardness of 150 or over. Cast steels are not recommended for use as mating surface.

MACHINING:

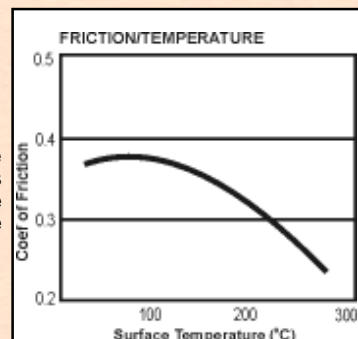
High speed steel tools are satisfactory for use with this material.

SIZE RANGE:

Thickness : 3 mm to 10 mm
 Sheet size : 1752 mm x 950 mm

Thickness : 11 mm to 32 mm
 Sheet size : 914 mm x 914 mm

This graph is derived from the results of a large number of tests and therefore represents the average friction level of the material.



FRICION SHEET COMP^o WASM – 80

COMP^o WASM-80 is a clutch facing material having a woven asbestos base with metallic inclusions in the form of brass wire. It is impregnated with an infusible bond capable of withstanding reasonably high clutch temperatures. It has a medium coefficient of friction, combined with good resistance to temperature and wear. WASM-80 is intended for use under dry operating conditions and is available in flat sheet form.



APPLICATIONS INDUSTRIAL CLUTCHES:

General engineering applications Tractor main engine clutches.

TECHNICAL DATA:

Friction
 μ for design purpose : 0.32 (dry)

PHYSICAL PROPERTIES(NOMINAL):

Data based on standard test methods.

Ultimate Tensile strength : 280 kg/cm²
 Ultimate Shear strength : 360 kg/cm²
 Ultimate Compressive strength : 2250 kg/cm²
 Rivet holding capacity : 1230 kg/cm²
 Specific gravity : 1.7

CLUTCH DESIGN:

A friction clutch should be capable of transmitting without slip, the maximum torque that can be applied to it once the clutch is fully engaged. The applied load in a clutch is not transmitted as efficiently as in brake and the fully effective torque radius is not always developed. This should be borne in mind when selecting the design co-efficient of friction, also taking into account the severity of the application and maximum operating temperatures of clutch surface. Normal engineering practice should be followed in applying an appropriate safety factor to the torque requirements of the unit.

RECOMMENDED OPERATING TEMPERATURE:

Maximum temperature : 350°C
 Maximum continuous temperature : 125°C

NOTE:

It is possible to exceed the recommended maximum temperature for a short period. The recommended maximum continuous temperature is commensurate with a reasonable rate of wear.

RECOMMENDED MATING SURFACE:

- Good quality close grain or alloy cast-iron.
- If steel, then forged or cold rolled with a Brinell Hardness of 200 or over. Cast steels are not recommended for use as mating surfaces.

MACHINING:

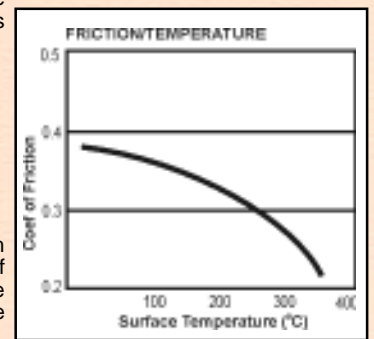
High speed steel tools are satisfactory for use with this material.

SIZE RANGE:

Thickness : 3 mm to 10 mm
 Sheet size : 1752 mm x 950 mm

Thickness : 11 mm to 32 mm
 Sheet size : 914 mm x 914 mm

Note This graph is derived from the results of a large number of tests and therefore represents the average friction level of the material.



FRICITION SHEET COMP^o CM-11



COMP^o CM-11 is a rigid moulded non-metallic friction material with a random fibre asbestos base. It possesses high mechanical strength together with a medium co-efficient of friction and a low rate of wear. It is suitable for either dry or under oil immersed conditions. CM-11 is

available in flat sheet form. Gear tooth can be cut from CM-11 with normal gear cutting facilities.

APPLICATIONS:

Industrial clutches, Marine Gear Box clutches, Tractor steering Clutches and Industrial Brakes.

TECHNICAL DATA:

Friction
 μ for design purpose : 0.3(Dry)

PHYSICAL PROPERTIES (NOMINAL):

Data based on standard test methods.

Ultimate tensile strength : 280 kg/cm²
 Ultimate shear strength : 112 kg/cm²
 Ultimate compressive strength : 1800 kg/cm²
 Specific gravity : 1:8

RECOMMENDED OPERATING TEMPERATURE:

Maximum Temperature : 350°C
 Maximum continuous temperature : 175°C

NOTE:

It is possible to exceed the recommended maximum temperature for short periods. The recommended maximum continuous temperature is commensurate with a reasonable rate of wear.

RECOMMENDED MATING SURFACE:

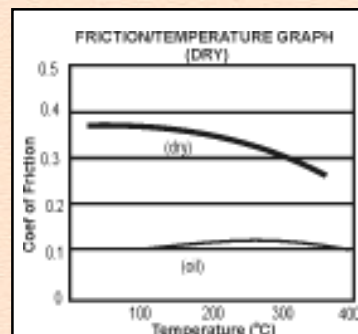
a) Good quality closes grain or alloy cast iron.
 b) If steel, then forged or cold rolled with a Brinell hardness of 200 or over. Cast steels are not recommended for use as mating surfaces.

SIZE RANGE:

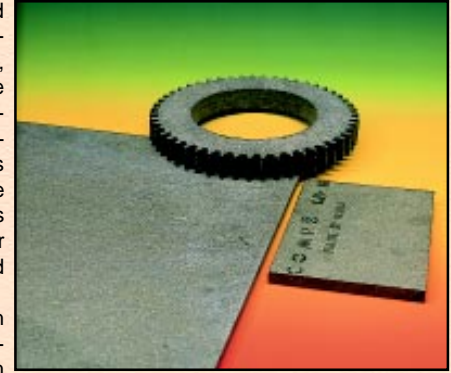
Thickness
 3mm to 50 mm
 Maximum length : 838 mm (33")
 Maximum width : 533 mm (21")

MACHINING DATA:

Carbide tipped tools are recommended for use with this material for drilling and boring. More details on machining data can be supplied on request.



FRICITION SHEET COMP^o CM-16



COMP^o CM-16 is a rigid moulded friction material, slate grey in colour, having a random fibre asbestos base and containing metallic inclusions in form of brass chippings. It is available in flat sheet form and is suitable for use either dry or in oil immersed applications.

CM-16 possesses high mechanical strength together with a medium

coefficient of friction and a low rate of wear. It machines well and discs can be gear-cut on the circumference, for use in multi-plate, clutches. When used in oil, the coefficient of friction is reduced considerably as the curves show. The friction level in oil can be influenced by the presence of or lack of a suitable grooving pattern. This material is suitable for use at medium to heavy levels of duty.

APPLICATIONS:

Clutches for marine gear boxes.
 Steering clutches for tractors.
 Clutches for power presses, machine tools and other industrial plant & machinery etc.,

TECHNICAL DATA:

Friction
 μ for design purposes : 0.28 (dry)

PHYSICAL PROPERTIES (NOMINAL):

Data based on standard test methods.

Specific gravity : 2.2
 Ultimate tensile strength : 290 kg/cm²
 Ultimate compressive strength : 2760 kg/cm²
 Ultimate shear strength : 120 kg/cm²

RECOMMENDED OPERATING RANGE

UNIT PRESSURE:

Dry : 1.0-7.0 kg/cm²
 In oil : 2-21 kg/cm²
 Maximum temperature : 350°C
 Maximum continuous temperature : 175°C

RECOMMENDED MATING SURFACES:

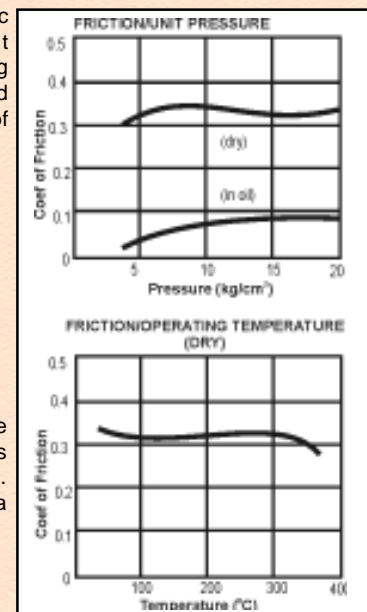
Good quality fine grained pearlitic cast iron. Cast steel is not suitable for use as a mating surface but forged or cold rolled steel with a Brinell hardness of 200 or more may be used.

SIZE RANGE:

Thickness
 3mm to 50 mm
 Maximum length - 838mm(33")
 Maximum width - 533 mm (21")

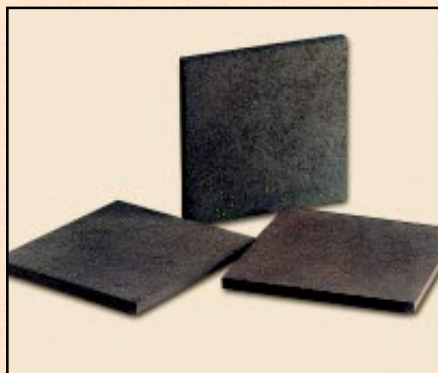
MACHINING DATA:

Carbide tipped tools are recommended for use with this material for drilling and boring. More details on machining data can be supplied on request.



ASBESTOS FREE FRICTION SHEETS

COMP^o FRICTION SHEET HCAF 211 GG



COMP^o HCAF 211 GG is one of the 'COMPO' range of Non asbestos friction materials, it is rigid moulded product, dark grey in colour and having short filaments of Steel and non-metallic substances in a random dispersion and uses a specially developed resin as matrix which contributes to both the strength and performance of material. This material is produced only in flat sheet form and suitable for use under

dry or oil immersed operating conditions HCAF 211 GG has medium friction with excellent fade and wear resistance. It machines well and suitable for use at a variety of duty levels, yielding consistent performance characteristics. This material is manufactured with ground finish on both surfaces, so may be bonded on either side.

APPLICATIONS:

Industrial Disc Brakes
Industrial Clutches
Tractor Steering Clutches

TECHNICAL DATA:

Friction

μ for design purpose : 0.35 (dry)

PHYSICAL PROPERTIES:

Data based on standard test methods.

Specific Gravity : 2.00
Rockwell Hardness : L65
Ultimate Compressive Strength : 850 kg/cm²
Ultimate Shear Strength : 115 kg/cm²
Ultimate Tensile Strength : 135 kg/cm²
Thermal conductivity : 0.97 W/m °C

RECOMMENDED OPERATING RANGE:

Maximum temperature : 350°C
Maximum continuous temperature : 150°C
Unit Pressure : 70-600 KN/m²
Maximum rubbing speed : 18m/sec.

SIZE RANGE:

Thickness : 3mm to 25mm.
Length : 304 mm (12")
Width : 304 mm (12")

NOTE:

The continuous temperature quoted is for constant slip condition. It is possible to exceed the recommended maximum continuous temperature for intermittent applications upto 225°C for long periods.

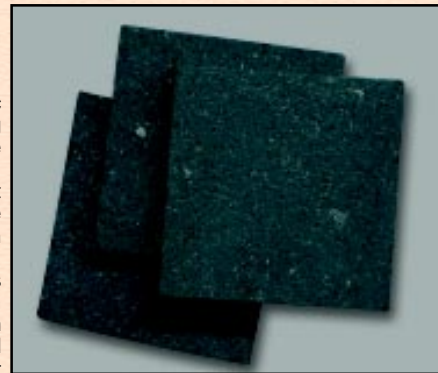
RECOMMENDED MATING SURFACE:

- (a) Good quality close grained pearlitic Cast iron.
- (b) If steel, then forged or cold rolled with a Brinell Hardness of 200 or over.
- (c) Cast Steels are not recommended for use as mating surface.

MACHINING DATA:

Carbide tipped tools are recommended for use with this material for drilling, turning and boring.

COMP^o FRICTION SHEET HCAF 216 GG



COMP^o HCAF 216 GG is a rigid moulded friction material which is mottled slate Grey in appearance, having random organic fibre base and containing metallic inclusions in the form of brass chippings. It is available in flat sheet form only and is suitable for use in either dry or in oil immersed applications. HCAF 216 GG possesses high mechanical strength together with a medium co-efficient of friction and low rate of wear. It

machines well and discs can be gear-cut on the circumference, for use in multiplate clutches. When used in oil, the co-efficient of friction reduces considerably from 0.32 to 0.17 level. The friction level in oil can be influenced by the presence of or lack of suitable grooving pattern. This material is suitable for use at medium to heavy levels of duty.

APPLICATIONS:

Clutches for marine gear boxes.
Steering clutches for tractors.
Clutches for power presses.

TECHNICAL DATA:

Friction

μ for design purpose : 0.32 (Dry)

PHYSICAL PROPERTIES:

Data based on Standard Test Methods:

Specific Gravity : 2.1
Ultimate Tensile Strength : 150 kg/cm²
Ultimate Shear Strength : 125 kg/cm²
Ultimate Compressive Strength : 900 kg/cm²
Rockwell Hardness : L 65
Gear Tooth Strength : 350 kg/cm²
Thermal conductivity : 0.529 W/m °C

RECOMMENDED OPERATING RANGE:

Maximum Temperature : 350 °C
Maximum continuous temperature : 150 °C
Unit Pressure (Dry) : 70-600 KN/m²
Unit Pressure (in oil) : 30-300 KN/m²
Maximum rubbing speed : 18m/sec.

SIZE RANGE:

Thickness : 3 mm to 25 mm.
Length : 304 mm (12")
Width : 304 mm (12")

NOTE:

The continuous temperature quoted is for constant slip condition. It is possible to exceed the recommended maximum continuous temperature for intermittent applications upto 225°C for long periods.

RECOMMENDED MATING SURFACE:

- (a) Good quality close grained pearlitic Cast iron.
- (b) If steel, then forged or cold rolled with a Brinell Hardness of 200 or over.
- (c) Cast Steels are not recommended for use as mating surface.

MACHINING DATA:

Carbide tipped tools are recommended for use with this material for drilling, turning and boring.



L. B. S. Marg, Ghatkopar (W), Mumbai - 400 086. Tel : 00-91-22-5171491/4

Fax : 91-22-5171495. email : sales@hindcompo.com. •Visit us at : <http://www.hindcompo.com>

Regional Sales Offices

- L. B. S. Marg, Ghatkopar (W), Mumbai - 400 086. Tel : 00-91-22-5171491/4, 5170491 Fax : 91-22-5171495. email : wro@hindcompo.com
- 20-A Camac Street Calcutta - 700 016. Tel : 00-91-33-2470229, 2402545. Fax : 00-91-33-2478142. email : hclcal@cal2.vsnl.net.in
- Meco House, 47 Mount Rd. Channi - 600 002 Tel : 00-91-44-8570952, 8570976. Fax : 00-91-44-8549822 email : compochn@md3.vsnl.net.in
- Hamilton House, Block A, Connaught Place, New Delhi - 110001. Tel : 00-91-11-3327110, 3329159. Fax : 00-91-11- 3324126. email : delcompo@mantraonline.com