COMPŌ

AUTOMOTIVE AND INDUSTRIAL ROLL LININGS & FRICTION SHEETS

Asbestos Free Range

HINDUSTAN COMPOSITES LIMITED

Committed to safety. Always.

COMPO HC AF 10

Compo HC AF 10 is a Non Asbestos Flexible Roll Lining . It is a moulded product having short filaments of Synthetic man made mineral fibers and organic fibers with highly thermally stable Synthetic Rubber (Styrene- Butadiene / Acrylonitrile Butadiene Rubber) as a binder and fused in a matrix which contributes to the strength and performance in terms of Friction/ Wear properties. Suitable for use in Band Brakes, Moped and Scooter Brakes and two-wheeler Clutch application. It is available in both liner and roll form and suitable for use under dry operating conditions only (i.e. it is not suitable for use in oil). Owing to its flexibility, it is easy to form to any radius and accommodates itself on the shoe.
HC AF 10 is also supplied with wire back reinforcement. It is available in Dark Grey and Brown Color.

APPLICATION: -
It is used in Band Brakes, Moped and Scooter Brake applications and Clutch applications.

TECHNICAL DATA: -
Co-efficient of friction for Design Purpose : - 0.48 (Dry Condition)

RECOMMENDED OPERATING RANGE:

Maximum Temperature	:	300°C
Maximum Continuous Operating Temperature	:	150°C
Maximum Continuous Operating Temperature	:	175°C

(Possible to exceed for shorter period)

RECOMMENDED MATING SURFACE
Good Quality Fine Grain pearlitic cast Iron, Forged or Cold Roll Steel also can be used

BRINELL HARDNESS OF MATING SURFACE:
200 minimum or more can be used

MACHINING DATA OF MATING SURFACE
High Speed steel tools are satisfactory for use on this material

BONDING HC AF 10 can be bonded with any of the established Bonding adhesives, although for best results, thermosetting adhesives (rubber base / phenolic powder resin base) should be used. The bonding temperature with aluminium diecasting and mildsteel material is 180°C to 240°C for 45 minutes to 1 Hour using static / conveyor hot air circulating oven. Proper preparation of the bonding surface like shot blasting /vapour degreasing and adhesive coating is required.

HC AF 10 is supplied ground on both the surfaces, so that it can be bonded on either surface as required without any further preparation.

SIZE RANGE Width 15mm to maximum 120mm
Thickness 5mm to 12mm.

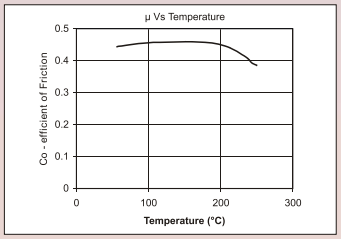
TYPICAL PHYSICAL PROPERTIES

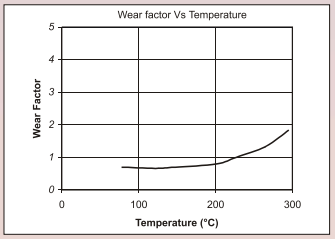
Density	1.9
Hardness	70 in Shore D
Heat Swell @ 200°C	0.18 mm
Water Swell	0.02 mm
Ultimate Compression Strength Kg/cm²	250
Maximum Continuous Operating Temperature (°C)	150
Classification as per SAE J661a	GG

TYPICAL CHEMICAL PROPERTIES

Acetone Extract	1.5%
Loss on Ignition	30.0%

TYPICAL FRICTION/WEAR PROPERTIES





COMPO HC AF 10B

Compo HC AF 10B is a moulded Non Asbestos flexible Roll Lining . It is a product having short filaments of Synthetic man made mineral fibers and organic fibers with highly thermally stable Synthetic Rubber (Styrene- Butadiene / Acrylonitrile Butadiene Rubber) as a binder and fused in a matrix which contributes to the strength and performance in terms of Friction/ Wear properties. Suitable for use in Automotive Drum Brakes, Industrial Drum Brakes and Band Brake applications. It is available in both liner and roll form and suitable for use under dry operating condition only (i.e. it is not suitable for use in oil). Owing to its flexibility, it is easy to form to any radius and accommodates itself on the shoe.
HC AF 10B is also supplied with wire back reinforcement. It is available in Dark Grey and Brown Color

APPLICATION: -
It is used in Automotive Drum Brakes, Industrial Drum Brakes and Band Brake applications

TECHNICAL DATA: -
Co-efficient of friction for Design Purpose: - 0.45 (Dry Condition)

RECOMMENDED OPERATING RANGE:

Maximum Temperature:	275°C
Maximum Continuous Operating Temperature:	150°C
Maximum Continuous Operating Temperature:	160°C

(Possible to exceed for shorter period)

RECOMMENDED MATING SURFACE
Good Quality Fine Grain pearlitic cast Iron, Forged or Cold Roll Steel also can be used

BRINELL HARDNESS OF MATING SURFACE
200 minimum or more can be used

MACHINING DATA OF MATING SURFACE
High Speed steel tools are satisfactory for use on this material

BONDING HC AF 10B can be bonded with any of the established Bonding adhesives, although for best results, thermosetting adhesives (rubber base / phenolic powder resin base) should be used. The bonding temperature with aluminium diecasting and mildsteel material is 180°C to 240°C for 45 minutes to 1 Hour using static / conveyor hot air circulating oven. Proper preparation of the bonding surface like shot blasting /vapour degreasing and adhesive coating is required.

HC AF 10B is supplied ground on both the surfaces, so that it can be bonded on either surface as required without any further preparation.

SIZE RANGE Width 15mm to maximum 120mm
Thickness 5mm to 12mm.

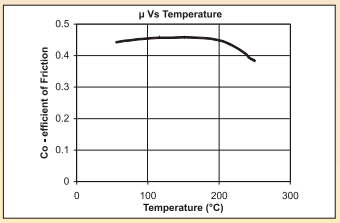
TYPICAL PHYSICAL PROPERTIES

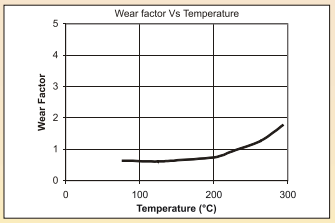
Density	2.0
Hardness	65 in Shore D
Heat Swell @ 200°C	0.12 mm
Water Swell	0.02 mm
Ultimate Compression Strength Kg/cm²	200
Maximum Continuous Operating Temperature (°C)	150
Classification as per SAE J661a	GG

TYPICAL CHEMICAL PROPERTIES

Acetone Extract	2.0%
Loss on Ignition	30.0%

TYPICAL FRICTION/WEAR PROPERTIES





COMPO HC AF 10D

Compo HC AF 10D is a Non Asbestos Flexible Roll Lining. It is a moulded product having short filaments of Steel Fiber and Synthetic man made mineral fibers and organic fibers with highly thermally stable Synthetic Rubber (Styrene- Butadiene / Acrylonitrile Butadiene Rubber) as a binder and fused in a matrix which contributes to the strength and performance in terms of Friction/ Wear properties. Suitable for use in Band Brakes, Two Wheeler and Industrial Drum Brakes. It is available in both liner and roll form and suitable for use under dry operating conditions only (i.e. it is not suitable for use in oil). Owing to its flexibility, it is easy to form to any radius and accommodates itself on the shoe.
HC AF 10D is also supplied with wire back reinforcement. It is available in Dark Grey and Brown color

APPLICATION: -
It is used in Band Brakes, Two Wheeler and Industrial Drum Brakes.

TECHNICAL DATA: -
Co-efficient of friction for Design Purpose: - 0.40 (Dry Condition)

RECOMMENDED OPERATING RANGE:
Maximum Temperature: - 325°C
Maximum Continuous Operating Temperature: - 175°C
Maximum Continuous Operating Temperature: - 200°C
(Possible to exceed for shorter period)

RECOMMENDED MATING SURFACE
Good Quality Fine Grained pearlitic cast Iron Forged or Cold Roll Steel also can be used

BRINELL HARDNESS OF MATING SURFACE
200 minimum or more can be used

MACHINING DATA OF MATING SURFACE
High Speed steel tools are satisfactory for use on this material

BONDING HC AF 10D can be bonded with any of the established Bonding adhesives, although for best results, thermosetting adhesives (rubber base / phenolic powder resin base) should be used. The bonding temperature with aluminium diecasting and mildsteel material is 180°C to 240°C for 45 minutes to 1 Hour using static / conveyor hot air circulating oven. Proper preparation of the bonding surface like shot blasting /vapour degreasing and adhesive coating is required.

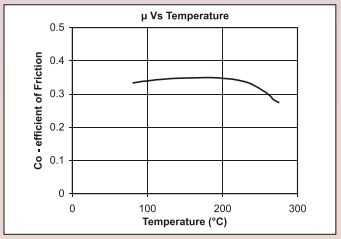
HC AF 10D is supplied ground on both the surfaces, so that it can be bonded on either surface as required without any further preparation.

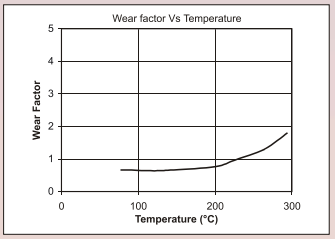
SIZE RANGE Width 15mm to maximum 120mm
Thickness 5mm to 12mm.

TYPICAL PHYSICAL PROPERTIES	
Density	1.9
Hardness	60 in Shore D
Heat Swell @ 200°C	0.12 mm
Water Swell	0.02 mm
Ultimate Compression Strength Kg/cm²	200
Maximum Continuous Operating Temperature (°C)	150
Classification as per SAE J661a	FF

TYPICAL CHEMICAL PROPERTIES	
Acetone Extract	2.0%
Loss on Ignition	35.0%

TYPICAL FRICTION/WEAR PROPERTIES





COMPO HC AF 11

Compo HC AF 11 is a moulded Non Asbestos Flexible Roll Lining. It is a product having short filaments of Synthetic man made mineral fibers and organic fibers with highly thermally stable Synthetic Rubber (Styrene-Butadiene / Acrylonitrile Butadiene Rubber) as a binder and fused in a matrix which contributes to strength and performance in terms of Friction/ Wear properties. Suitable for use in Drum Brakes, Light Trucks and Commercial Vehicles, Band Brakes, Moped, Scooter, and Motor Cycle Brake applications. It is available in both liner and roll form and suitable for use under dry operating condition only (i.e. it is not suitable for use in oil). Owing to its flexibility, it is easy to form to any radius and accommodates itself on the shoe.
HC AF 11 is also supplied with wire back reinforcement. It is available in Dark Grey and Brown color.

APPLICATION: -
It is used in Drum Brakes, Light Trucks and Commercial Vehicles, Band Brakes, Moped, Scooter, and Motor Cycle Brake applications.

TECHNICAL DATA: -
Co-efficient of friction for Design Purpose : - 0.42 (Dry Condition)

RECOMMENDED OPERATING RANGE:
Maximum Temperature: 350°C
Maximum Continuous Operating Temperature: 200°C
Maximum Continuous Operating Temperature: 225°C
(Possible to exceed for shorter period)

RECOMMENDED MATING SURFACE
Good Quality Fine Grained pearlitic cast Iron Forged or Cold Roll Steel also can be used

BRINELL HARDNESS OF MATING SURFACE
200 minimum or more can be used

MACHINING DATA OF MATING SURFACE
High Speed steel tools are satisfactory for use on this material

BONDING HC AF 11 can be bonded with any of the established Bonding adhesives, although for best results, thermosetting adhesives (rubber base / phenolic powder resin base) should be used. The bonding temperature with aluminium diecasting and mildsteel material is 180°C to 240°C for 45 minutes to 1 Hour using static / conveyor hot air circulating oven. Proper preparation of the bonding surface like shot blasting /vapour degreasing and adhesive coating is required.

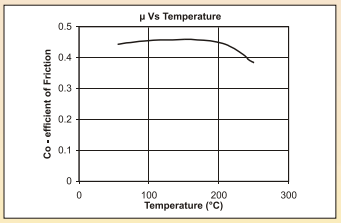
HC AF 11 is supplied ground on both the surfaces, so that it can be bonded on either surface as required without any further preparation.

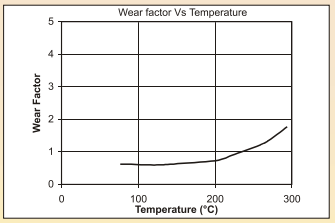
SIZE RANGE Width 15mm to maximum 120mm
Thickness 5mm to 12mm.

TYPICAL PHYSICAL PROPERTIES	
Density	1.98
Hardness	58 in Shore D
Heat Swell @ 200°C	0.14 mm
Water Swell	0.03 mm
Ultimate Compression Strength Kg/cm²	225
Maximum Continuous Operating Temperature (°C)	150
Classification as per SAE J661a	GF

TYPICAL CHEMICAL PROPERTIES	
Acetone Extract	1.85%
Loss on Ignition	31.0%

TYPICAL FRICTION/WEAR PROPERTIES





MAGMA AF 123

MAGMA AF 123 is a semi flexible Composite woven friction material with carded and friction spun yarns of man made mineral fibres (MMF) and natural fibres incorporating brass wire in its construction. The 3- axis construction, in combination with a very high temperature resistant resin, produces a dense tough lining which exhibits excellent resistance to fade and compression under load. The specially developed resin has high temperature resistance, giving the material excellent anti-fade and wear properties. This material is available in roll lining forms. It is suitable for use under dry operating conditions only (i.e. it is not suitable for use in oil). Magma AF 123 is supplied ground on both the surfaces, making it suitable for bonding and riveting to either internal or external contracting braking systems.

APPLICATIONS:
A most efficient general purpose brake lining suitable for use on most applications, including winches, cranes, earth moving and agricultural equipment, forging machinery and many others.

TECHNICAL DATA:
Co-efficient of Friction for Design purpose: - 0.35 (Dry)

RECOMMENDED OPERATING RANGE

Maximum Temperature	350°C
Maximum Continuous temperature	150°C

BONDING
MAGMA AF 123 may be bonded with any of the established bonding adhesives although for the best results thermosetting adhesives should be used

RECOMMENDED MATING SURFACE:
Close Grain Cast iron. Forged or cold rolled steel with a Brinnell hardness of 180 or more may be used.

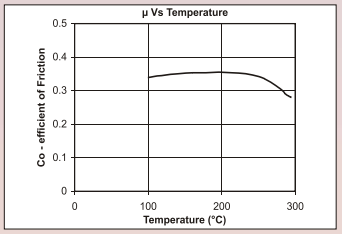
MACHINING DATA.
Carbide tipped tools are recommended for use with this material for drilling, turning and boring. HSS Drills are quite acceptable at the following speeds

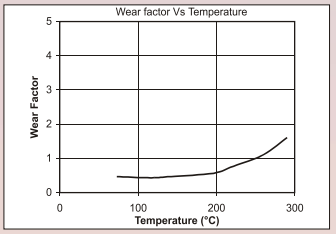
Upto ½" diameter - 850revs/minwith feed rate 0.005"/rev
Over ½" diameter - the revs/min should be reduced accordingly
For example:
At 5/8" diameter - 600 revs/min the feed rate 0.005"/rev.
SIZE RANGE : Thickness - 16.0 mm(max) both sides ground
Width - 300 mm(max) in ground condition
Standard length per roll - 10 metres

TYPICAL PHYSICAL PROPERTIES

Density	1.25-1.5
Hardness (Shore D)	55 +/- 7
Friction (Batch Test Method)	0.35-0.42
Wear by weight (gm)	0.500 (max)
Wear By Thickness (mm)	0.40 (max)
Tensile Strength at room Temperature Kg/cm²	190
Ultimate Compression Kg/cm²	600 (min)
Maximum Temperature (°C)	350
Maximum Continuous Operating Temperature (°C)	150

TYPICAL FRICTION/WEAR PROPERTIES





WAF 110

WAF 110 is a semi rigid, solid woven man made mineral fibre (MMF) and natural Fibre based friction material with a brass wire content. It is primarily intended for use under oil immersed conditions, but can be used under dry operating conditions. When in use for an oil immersed application, should the supply of lubricant fail, WAF 110 will continue to function and avoid immediate failure of the unit. It is available in Roll form and supplied ground on both the surfaces.

APPLICATIONS:
Oil immersed brakes, plate and cone clutches for industrial usage, earth moving Equipment, Agricultural Machinery etc.,

TECHNICAL DATA:
Co-efficient of Friction for Design purpose: - 0.30

RECOMMENDED OPERATING RANGE

Maximum Temperature	260°C
Maximum Continuous temperature	125°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.

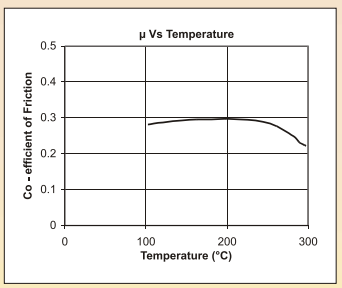
RECOMMENDED MATING SURFACE:
Good Quality fine grain Pearlitic Cast Iron. Cast steel is not suitable as a mating surface but forged or cold rolled steel with a Brinell Hardness of 150 or more may be used.

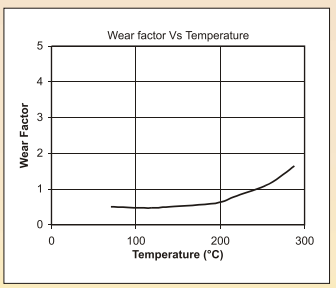
MACHINING DATA.
Carbide tipped tools are recommended for use with this material for drilling, turning and boring.
SIZE RANGE : Thickness - 16.0 mm(max) both sides ground
Width - 300 mm(max) in ground condition
Standard length per roll - 10 metres

TYPICAL PHYSICAL PROPERTIES

Density	1.25-1.5
Hardness	55 +/- 7
Friction (Batch Test Method)	0.30-0.40
Wear by weight (gm)	0.500 (max)
Wear By Thickness (mm)	0.500 (max)
Tensile Strength at room Temperature Kg/cm²	160 (min)
Ultimate Compression Kg/cm²	450 (min)
Maximum Temperature (°C)	260
Maximum Continuous Operating Temperature (°C)	125

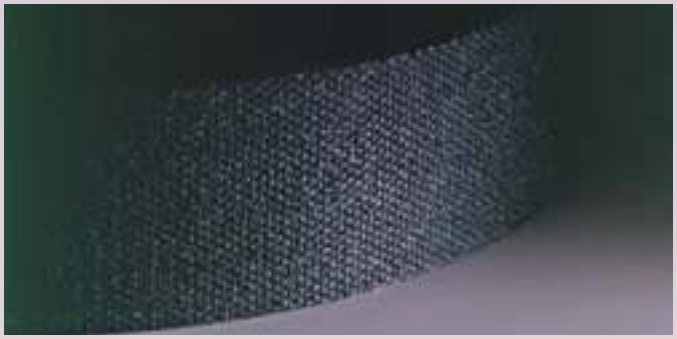
TYPICAL FRICTION/WEAR PROPERTIES





WAF 18

WAF 18 is a flexible, solid woven man made mineral fibre (MMF) based friction material made from yarn, spun around brass wire. It is solely intended for use under Dry conditions. WAF 18 has a medium / high co-efficient of friction with moderate temperature and wear resistance. It is available in Roll form only. Special shapes can easily be cut from it. Forming can be made easier by placing the material in an oven at a maximum temperature of 100°C (212°F).
WAF 18 is supplied in unground condition.



APPLICATIONS:
Industrial Band, Drum Brakes Linings, plate and cone clutch Linings and also for certain Heavy Road Transport Vehicles and Tractors.

TECHNICAL DATA:
Co-efficient of Friction for Design purpose: - 0.30

RECOMMENDED OPERATING RANGE

Maximum Temperature	: 260°C
Maximum Continuous temperature	: 125°C
Unit Pressure	: 10-100 lb/in² (1-7 Kg/Cm²)
Maximum Velocity	60 ft/sec (18 m/sec)

Note: The continuous temperature quoted is for constant slip condition. For intermittent applications, Peak temperature of 160°C is acceptable for long period.

RECOMMENDED MATING SURFACE:
Good Quality fine grain Pearlitic Cast Iron. Cast steel is not suitable as mating surface but forged or cold rolled steel with a Brinell hardness of 200 or more may be used.

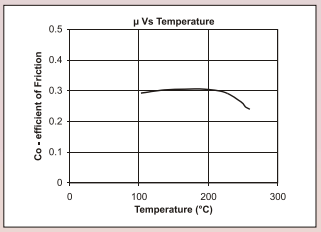
MACHINING DATA.
High Speed Steel tools are recommended for use with this material.

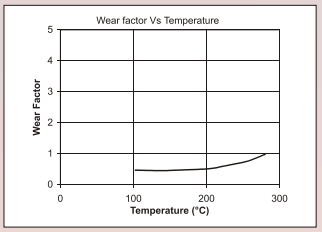
SIZE RANGE : Thickness - 19.0 mm(max)
Width - 635 cms (max)
Standard length per roll - 15 metres

TYPICAL PHYSICAL PROPERTIES

Density	1.2
Friction (Batch Test Method)	0.30 0.40
Wear by weight (gm)	0.7 (max)
Wear By Thickness (mm)	0.7 (max)
Tensile Strength at room Temperature Kg/cm²	160 (min)
Ultimate Compression Kg/cm²	500 (min)
Maximum Temperature (°C	260
Maximum Continuous Operating Temperature (°C)	125

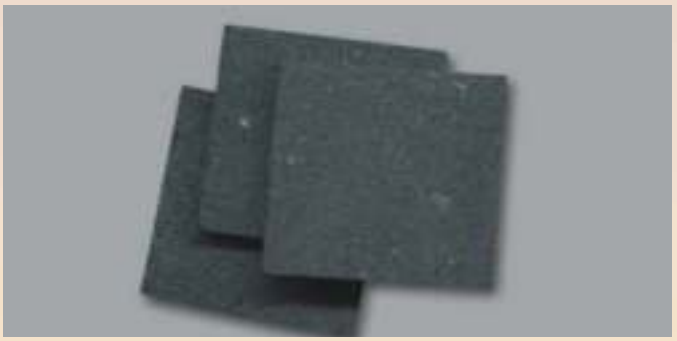
TYPICAL FRICTION / WEAR PROPERTIES





COMPO HC AF 211

Compo HC AF 211 is a Non asbestos friction material. It is a rigid moulded product, dark gray in color 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 the material. This material is produced only in flat sheet form and suitable for use under dry operating conditions only. HC AF 211 has medium friction with excellent fade and wear resistance properties. It machines well and is suitable for use at a variety of duty levels, yielding consistent performance characteristics. This material is manufactured with ground finish on both the surfaces, so may be bonded on either side.



APPLICATIONS:
Industrial Disc Brakes, Industrial Clutches, Tractor Steering Clutches

TECHNICAL DATA:
Co-efficient of Friction for Design purpose: - 0.35 (Dry)

RECOMMENDED OPERATING RANGE

Maximum Temperature	350°C
Maximum Continuous temperature	150°C
Unit pressure	70-600 KN/m²
Maximum rubbing speed	18 m/sec.

SIZE RANGE

Thickness	3.0 mm to 25.0 mm,
Length	500 mm(19.68")
Width	500 mm (19.68")

Note: The continuous temperature quoted is for constant slip condition. It is possible to exceed the recommended maximum continuous temperature for intermittent application upto 225°C.

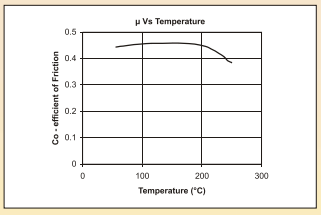
RECOMMENDED MATING SURFACE:
Good Quality close grain pearilitic Cast Iron. If Steel, then forged or cold rolled with a Brinell Hardness of 200 or over. Cast Steels are not recommended for use as mating surface.

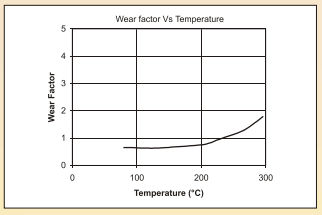
MACHINING DATA.
Carbide tipped tools are recommended for use with this material for drilling, turning and boring.

TYPICAL PHYSICAL PROPERTIES

Density	2.0
Hardness	65 in Rockwell HRL
Ultimate Compression Strenght Kg/cm²	850
Ultimate Shear Strenght Kg/cm²	115
Ultimate Tensile Strenght Kg/cm²	135
Thermal Conductivity W/m C	0.97
Maximum Continuous Operating Temperature (°C)	150
Classification as per SAE J661a	GG

TYPICAL FRICTION / WEAR PROPERTIES





COMPO HC AF 216

Compo HC AF 216 is a rigid moulded friction material which is mottled slate Grey in appearance having random organic fiber 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. HC AF 216 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 0.12 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 marines gear boxes, Steering Clutches for Tractors, Clutches for power presses

TECHNICAL DATA:

Co-efficient of Friction for Design purpose: -	0.32 (Dry) 0.12 (Under Oil Condition)

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	18 m/sec.

SIZE RANGE

Thickness	3.0 mm to 25.0 mm
Length	500 mm (19.68")
Width	500 mm (19.68")

Note: The continuous temperature quoted is for constant slip condition. It is possible to exceed the recommended maximum continuous temperature for intermittent application upto 225°C.

RECOMMENDED MATING SURFACE:

Good Quality close grain pearilitic 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 surface.

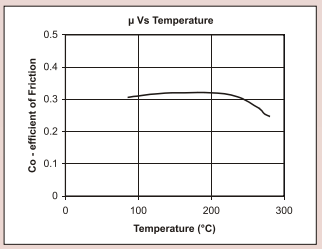
MACHINING DATA.

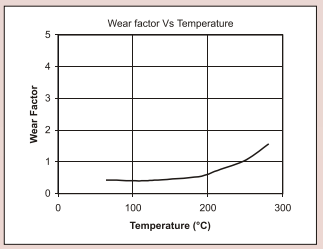
Carbide tipped tools are recommended for use with this material for drilling, turning and boring.

TYPICAL PHYSICAL PROPERTIES

Density	2.10
Hardness	65 in Rockwell HRL
Ultimate Compression Strenght Kg/cm^2	900
Ultimate Shear Strenght Kg/cm^2	125
Ultimate Tensile Strenght Kg/cm^2	150
Thermal Conductivity W/m C	0.529
Maximum Continuous Operating Temperature (^{0}C)	150
Classification as per SAE J661a	GG

TYPICAL FRICTION / WEAR PROPERTIES





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