

Friction Material Training Guide



Marathon
BRAKE SYSTEMS

Friction Material Training Guide

Marathon Brake Systems has developed this friction material training guide to help its sales channel partners to succeed in the highly competitive world of the heavy duty aftermarket. We want to give you the tools to ensure you're fully aware of our complete family of friction materials, to be able to recommend the ideal brake lining for your customer's application and then share the benefits of Marathon's lining.

We understand that our premium products typically are going to be more expensive than our competitor's products. With this reality, our sales partners have to be prepared to explain what makes Marathon special and why it's worth paying a few dollars more for a Marathon brake lining.

In this guide we cover several topics to help you deliver this message. We dig into the premium versus economy lining issue and illustrate the difference with a financial ROI comparison. We help you recommend the right material for your fleet customer's vocation with an article on 20,000 lb. versus 23,000 lb. brake linings and our Marathon application guide. Tips on making a fleet sales call, background information on RSD - required stopping distance, cross reference charts and brake shoe ID photos for the most popular part numbers should all help you make the most professional sales call possible.

The Marathon Advantage	2-3
Marathon Application Guide	4-5
DiscStar Disc Pads	6
Marathon Vocational Products	7
World Class Manufacturing	8
Making a Fleet Sales Call	9
Top Part Numbers/Brake Shoe ID	10-11
Marathon New Brake Shoes & Shoe Kits	12-13
Premium vs Economy Grade Brake Linings	14
20K vs. 23K Linings	15
Lining Cross Reference	16
RSD - Required Stopping Distance	17
Customer Testimonials	18
Website Resources	19

Hi-Density Friction

Get longer lining life and better stopping power with proven Marathon brake linings

Marathon uses higher quality and heavier raw materials in formulating its brake linings, creating a higher density brake block. Hi-Density linings are better able to handle the high heat of a truck brake, giving you a longer lining life, as well as better fade and recovery for stopping power you can count on. And Hi-Density linings have stronger structural integrity, making them less likely to crack during riveting or due to rust jacking.

For more than 25 years Marathon brake linings have been proving their value across North America. Our family of Best-In-Class friction materials are designed for applications ranging from general over-the-road freight to severe duty to intercity transit. The bottom line? A more efficient fleet with lower maintenance costs... it's **The Marathon Advantage**.



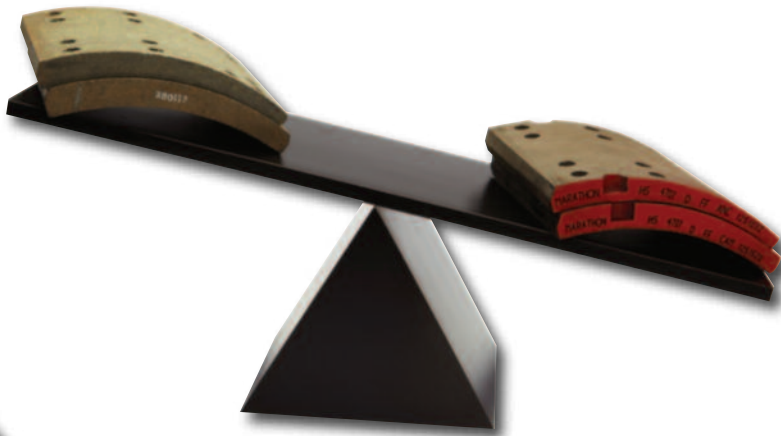
It's the Marathon Advantage

Why is Hi-Density Important in Friction Materials?

Hi-Density Friction

One of the most significant design characteristics of any heavy duty brake lining is its density. When higher quality and heavier raw materials are used in a lining's formulation, it creates a higher mass in the block or stated another way, higher density. Truck brakes are designed to convert the energy of a moving vehicle into heat energy. A higher density increases the lining's ability to efficiently handle heat, and is the most critical component in a friction material's fade, recovery and wear.

- Higher density friction materials have the ability to hold more heat energy and therefore more efficiently dissipate the heat
- Higher density friction materials have stronger structural integrity, making them less likely to crack in service, while riveting or due to rust jacking
- Higher density linings exhibit significantly better wear characteristics, especially at higher temperatures
- Higher density friction materials are more resistant to brake fade and water fade



See the difference... higher density Marathon linings tip the scale vs. leading competitor

**Feel the Difference...
Sell the Difference!**

Hi-Density Friction delivers improved Structural Integrity & Lining Life



Cracked competitor's lining

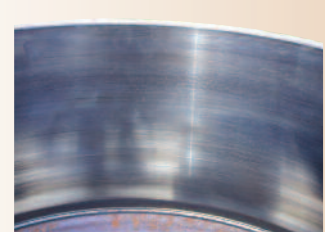


Structurally sound Marathon lining

Hi-Density Friction delivers improved Brake Drum Compatibility



Brake drum showing damage from competitor's material



Brake drum in excellent condition from Marathon material

Hi-Density Friction delivers improved Resistance to Rust Jacking



The strength of Marathon's linings make them better able to withstand the effects of rust jacking on a brake shoe.

Marathon Advantage

Average Density Advantage of Marathon Linings vs. Competitors

+15% vs Federal Mogul/Abex

+20% vs Stemco/Duroline

+25% Haldex

+20% Arvin Meritor/ Fraste

HEATSTAR

23,000 lb

Friction Code: FF
Density: 2.28
Edge Color: Red



FLOE

First Line Original Equipment
23,000 lb

Friction Code: FF
Density: 2.25
Edge Color: Brown



MV23

Marathon Value
23,000 lb

Friction Code: GF
Density: 2.20
Edge Color: None



MBC

Metallic Brass Combo
23,000 lb

Friction Code: FF
Density: 2.89/2.28
Edge Color: Red/Stripe



MBS

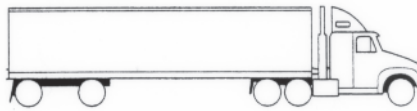
Metallic Brass Single
23,000 lb

Friction Code: FF
Density: 2.89
Edge Color: Stripe



Severe Duty Medium Duty Light Duty

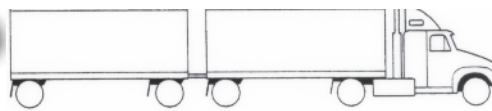
Tandem Axle Tractor Trailer



Best Better Good

HS	HS	HS20
—	FLOE	FS20
—	MV23	MV20

Double Trailer



HS	HS	HS20
—	FLOE	FS20
—	MV23	MV20

Van Trailer



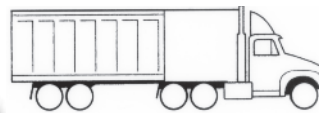
HS	HS	HS20
—	FLOE	FS20
—	MV23	MV20

Single Axle Tractor Trailer



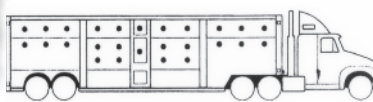
HS	HS	HS20
—	FLOE	FS20
—	MV23	MV20

Container Chassis



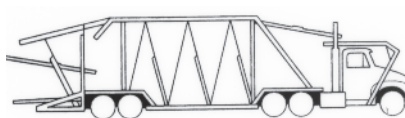
HS	HS	HS20
—	FLOE	FS20
—	MV23	MV20

Livestock Trailer



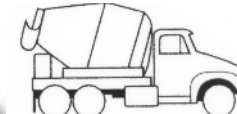
HS	HS	HS20
—	FLOE	FS20
—	—	—

Car Trailer



HS	HS	HS20
—	FLOE	FS20
—	—	—

Tandem Axle Mixer



KVT	HS	—
HS	FLOE	—
TS	—	—

Single Axle Dump Truck



KVT	HS	—
HS	FLOE	—
TS	—	—

Tandem Axle Dump Truck



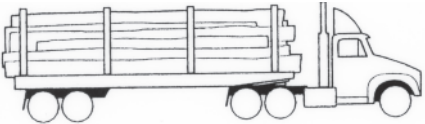
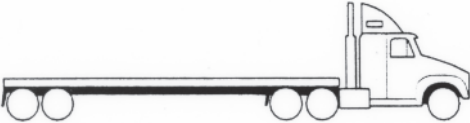
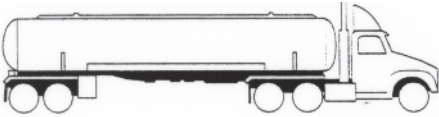
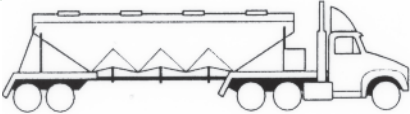
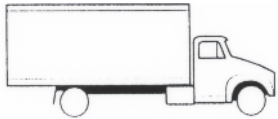
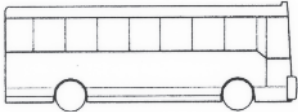
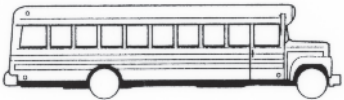


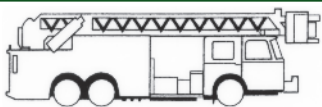
KVT	HS	—
HS	FLOE	—
TS	—	—

Tri-Axle Dump Trailer



KVT	HS	—
HS	FLOE	—
TS	—	—

Brake Lining Application Guide

	Severe Duty	Medium Duty	Light Duty
Logging Trailer			
	Best Better Good	KVT/MBS MBC TS	HS FLOE —
Flatbed Trailer			
	—	HS FLOE MV23	HS20 FS20 MV20
Tanker			
	KVT MBC —	HS FLOE —	HS20 FS20 —
Dry Bulk			
	KVT MBC —	HS FLOE —	HS20 FS20 —
Straight Truck			
	HS — —	HS FLOE MV23	HS20 FS20 MV20
Transit/Coach Bus			
	MBST KVT —	HS — —	— — —
School Bus			
	KVT — —	HS FLOE —	HS20 — —
Single Axle Refuse Truck			
	KVT MBS MBC	HS FLOE —	— — —
Tandem Axle Refuse Truck			
	KVT MBS MBC	HS FLOE —	— — —
Fire Truck			
	KVT TS —	MBS MBC —	HS FLOE —

HS20 HEATSTAR



20,000 lb

Friction Code: FF
Density: 2.21
Edge Color: Blue



FS20 FLEETSTAR



20,000 lb

Friction Code: FF
Density: 2.22
Edge Color: Light Blue

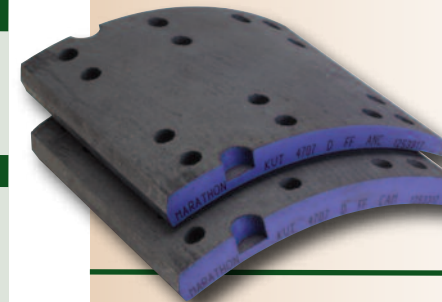
Marathon Value MV20



20,000 lb

Friction Code: FF
Density: 2.20
Edge Color: None

Vocational KVT



26,000 lb

Friction Code: FF
Density: 2.13
Edge Color: Purple

Traction Stopper TS



25,000 lb

Friction Code: GG
Density: 2.17
Edge Color: Stripe

Marathon Disc Pads



Highway Premium Air Disc Pads

Marathon has expanded its DiscStar product line to address the continued growth of disc brakes in the heavy-duty market. Disc Star Highway Premium (DSHP) is a high performance commercial vehicle disc pad designed specifically for air disc brakes. DiscStar Highway Premium pads were created for on-highway truck, tractor steer and drive axles, trailers, and motor coaches. This premium low-metallic material is rated for 23,000 lbs. and provides long pad life, quiet stopping and high shear resistance.

- Ideal for on-highway commercial applications, including truck and motor coach



Transit Premium Air Disc Pads

As the use of disc brakes continues to grow in the heavy-duty industry, Marathon now offers a high performance commercial vehicle disc pad, DiscStar Transit Premium (DSTP). Designed specifically for air disc brakes, Marathon's DiscStar Transit Premium pads were created to handle the extreme conditions of transit and coach, as well as severe service applications like fire trucks, refuse and more. Formulated using Marathon's severe service ceramic expertise, DiscStar disc pads exhibit less wear, more effective stopping power and high shear resistance.

- Ideal for heavy-duty commercial applications, including transit and motor coach



Semi-Metallic Disc Pads

Marathon developed its premium DiscStar semi-metallic disc brake pads to address the severe duty braking requirements of a wide range of hydraulic disc brake applications. This semi-metallic friction material provides high temperature stability and therefore consistent stopping power for school buses, delivery trucks, utility trucks, tow trucks, shuttle buses and any application where stop-and-go service is the norm. DiscStar semi-metallic pads have been formulated to provide a long pad life, minimize rotor wear and ensure quiet operation.

- Ideal for severe duty hydraulic disc brake applications, including school buses and utility-type trucks



Vocational Products

KVT Vocational

Marathon developed KVT brake linings to handle the high heat and heavy-duty demands of refuse, concrete, logging, sand and gravel, oil delivery, beverage transport and other tough applications. KVT is a premium, organic material rated for 25,000 lb axle loads that provides stopping power you can count on with a long service life.

This versatile lining meets Federal regulations in accordance with FMVSS 121 test procedure for applications up to 25,000 lbs. KVT linings feature the Hi-Density Marathon formulation that will improve your bottom line through better performance and fewer maintenance headaches.



MBC - Marathon Brake Combination

Marathon developed its combination brake block to be the industry leader in lining life and stopping power. Featuring our proven Heat Star organic and metallic brass materials, MBC linings handle the high heat commonly found in severe duty applications like coal hauling or refuse collection.

MBC easily meets Federal regulations for brake effectiveness, fade and recovery in accordance with FMVSS 121 test procedure and is rated for 23,000 lb axle loads. MBC linings feature the Hi-Density Marathon formulation that will improve your bottom line through better performance and fewer maintenance headaches.



KVT Transit

OE Transit Approved KVT is specifically formulated to handle the high heat of multiple stopping of a city bus and the heavy-duty demands of a motor coach. KVT is an organic, non-asbestos brake lining that combines stopping power and quiet operation with a long lining life.

KVT is a proven formulation easily meeting Federal regulations for brake effectiveness, fade and recovery in accordance with FMVSS 121 test procedure and is rated for 28,660 lb axle loads. KVT linings feature the Hi-Density Marathon formulation that will improve your bottom line through better performance and fewer maintenance headaches.



World Class Manufacturing

Marathon's World Class Process

All Marathon friction materials are produced in our state-of-the-art ISO 14000:2004 certified manufacturing facility which opened in 2014. This new 40,000 square foot plant features a geo-thermal cooling system to maintain optimum and consistent humidity and temperature, an automated raw material weighing system to ensure batch-to-batch consistency and continuous curing ovens for better swell and growth control of the friction material. We utilize a wide range of quality systems including an automated ultra-sound scanning system to examine 100% of our friction for any possible delamination. This world class Marathon manufacturing process goes from raw material to finished brake lining in less than five hours!



Marathon's 40,000 sq. ft. manufacturing facility opened in 2014 and offers the ability to double capacity



Automated weighing system ensures batch-to-batch consistency



Computer controlled hot presses ensure optimal product curing



World class manufacturing process goes from raw material to finished product in under five hours



Making a Fleet Sales Call

Things to Consider & Questions to Ask

Fleet Details

- Size of the fleet: number of trailers, tractors, straight trucks
- What are the models of the equipment?
- What is the average age of the equipment?
- Are they adding or deleting any equipment?
- What style of brake are they running?

Current Brake Lining

- What is the current lining they are using?
- How well is it working, are they having any issues?
- Are there mileage records?
- What are the current mileage levels?
- What is the new expected mileage in order to gain the business?

Type of Service

- What type of service are the brakes on?
- What type of loads do they carry?
- Are they loaded all day?
- What is the terrain they are driving over?
- Are they company drivers or brokers?
- Is there a Jake brake on board the equipment?
- Is there a brake retarder on board the equipment?

Brake Lining Supplier

- Who is their current supplier?
- Why do they deal with their current supplier?
- How did they decide on their current lining specification?
- Are they happy with it?

Brake Knowledge

- Do they do their own brake work or sub it out?
- Are they aware of what a balanced brake system means?
- Do they own a brake drum gauge?
- Do they own a heat gauge?
- Do they always replace the drums?

Check Out the Customer's Core Pile

If you know what to look for, a customer's cores will tell you about potential problems the fleet is having, such as:

- Cracking from running too hot
- Cracks on the side could mean a twisted table
- Glazed shoes are not running hot enough
- Rust Jacking
- If some shoes look like they are performing well, pull one out and try to identify the lining



Most Frequently Specified Part Numbers

Shoe FMSI Number	Friction FMSI	Products Available	Which Axle (most often)	Drum Diameter (inches)	Brake Width (inches)
4707QP	Meritor 4707D	All	Drive	16 1/2	7
4515Q	Meritor 4515E, C or G	All	Drive	16 1/2	7
4709E1 or 4709E2	Dana 4709D	All	Drive	16 1/2	7
4311E	Dana 4311J or G	All	Drive	16 1/2	7
4702QP	Meritor 4702D	All	Steer	15	4
1308Q or 1308E	Meritor 1308TT	All	Steer	15	4
1443E	Eaton 1443TT	All	Steer	15	4
4726E2	Dana 4726D	All but MV	Drive	16 1/2	8 5/8
4711QP	Meritor 4711D	All but MV	Drive	16 1/2	8 5/8
4715QP	Meritor 4715D	All but MV	Steer	16 1/2	6
4719E2	Dana 4719D	All but MV	Steer	16 1/2	5
4725E2	Dana 4725D	All but MV	Steer	16 1/2	6
4720QP	Meritor 4720D	All but MV	Steer	16 1/2	5
4718QP	Meritor 4718D	All but MV	Drive	16 1/2	8
4703QP	Dana 4703D	All but MV	Steer	15	5

Brake Shoe Identification 15" Drum

Meritor Q+ Dual Rail Shoe



Q+ stamped in rail on OE shoe

Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
4"	4702QP	E9064	4702Q00
5"	4703QP	E9064	4702Q00

Eaton ES Single Anchor Pin Front Brake



Shoe Width	FMSI No.	Euclid	Dayton
4"	1443E	E5139	1308E00

Meritor Q Style Brake, Single Rail Shoe

Note: Early design and current design shoes have different table locations. Do not mix on wheel ends.



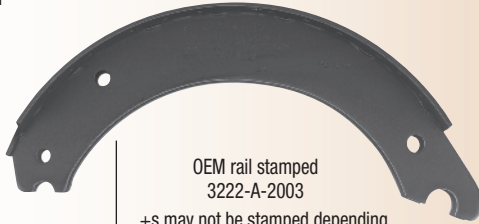
Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
4"	1308Q	E3869	1308Q00

Brake Shoe Identification Guide

16-1/2" Drum

Meritor Q+ Style



Note: No hump present in web

OEM rail stamped
3222-A-2003
+s may not be stamped depending on manufacturer.
Note: Some applications require special hardware

Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
5"	4720QP	E2769SHD or E9644	4524MQ30
6"	4715QP	E2769SHD or E9644	4515Q30BG
7"	4707QP	E2769SHD or E9644	4515Q30BG
8"	4718QP	E2769SHD or E9644	4515Q30BG
8-5/8"	4711QP	E2769SHD or E9644	4515Q30BG

Dana Spicer/Eaton ES Series, Current Design, Single Anchor Pin



Some aftermarket versions incorporate 1st design table with 2nd design webs so they may be used in either application

Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
5"	4719E2	E10244S or E10760	470902
6"	4725E2	E10244S or E10760	470902
7"	4709E2	E10244S or E10760	470902
8-5/8"	4726E2	E10244S or E10760	470902

Dana Spicer/Eaton EB Series Low Mount, Single Anchor Pin Design



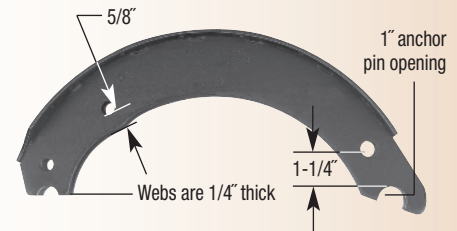
Note: Low-mount shoes cannot replace high-mount shoes

For faster ID, spring pin will be directly across from opening in web.

Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
7"	4311E	E1887AHD	431101

Meritor Q Style Brake



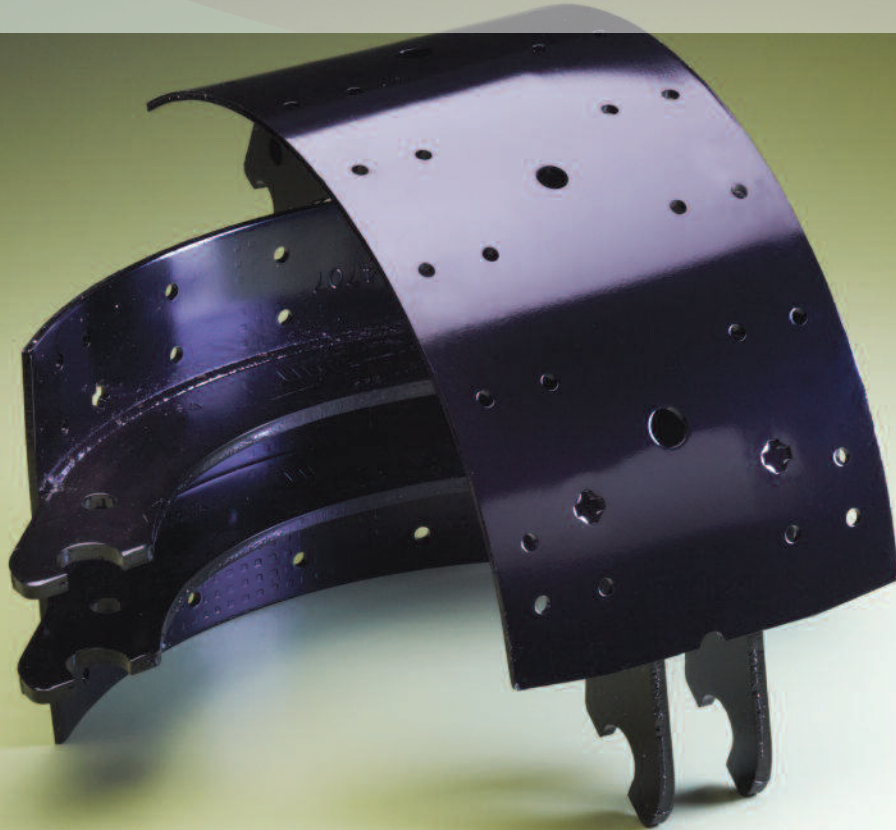
Note: Some applications require special hardware

OEM shoe rail stamped
3222-Q-1291

Hardware Kit No.

Shoe Width	FMSI No.	Euclid	Dayton
7"	4515Q	E2769SHD	4515Q30BG

Marathon Brake Shoes



OEM quality you can count on

Achieving maximum life and safety from your friction material begins with its foundation... the brake shoe. Ensure the performance of your brake linings with a new brake shoe from Marathon. Our new shoes are manufactured and tested to the highest OEM standards. Marathon shoes feature:

- **E-Coating** – (electro-deposition coating) applied to every Marathon brake shoe to prevent rust jacking. All Marathon brake shoes are environmentally tested to withstand 1,000 hours of salt spray testing, DOUBLE the standard of other OEMs.
- **Higher Grade Steel** – all shoe tables and webs are made from high grade carbon steel which adheres to tightly controlled specifications, ensuring weld strength and performance.
- **Seam-Welding** – unlike competitors who only spot weld brake shoes, Marathon provides complete welding along the shoe's entire table/web seam – ensuring strength and durability.
- **Heat Treating** – we treat roller and anchor journals to harden the steel and prevent wear like distortion and mushrooming, common on relined shoes. This can often result in slippage and cause excessive lining wear, shortening the life of your brake shoe.
- **TS16949 Certification** – all Marathon shoes are manufactured under the highest quality OE certification.
- **Precise Dimension Monitoring** - critical dimensions such as shoe radius are monitored and controlled with computerized gauges to ensure Marathon brake shoes will provide uniform, balanced braking performance and prevent “hot spots” which can shorten friction life.
- **Thick Construction** - thicker steel for platform, web and base than most competitors.



Marathon Brake shoes after 24-hours of salt-spray exposure.

Lined Shoes & Shoe Kits



Proven Marathon brake linings on an OEM quality shoe... it's a combination you can't beat

Marathon's family of Hi-Density friction materials can be delivered to your door already riveted on an OEM quality new brake shoe. And to further simplify your brake job, our new shoe kits include an OEM quality hardware kit with the lined shoes... a package ready for installation. Marathon delivers:

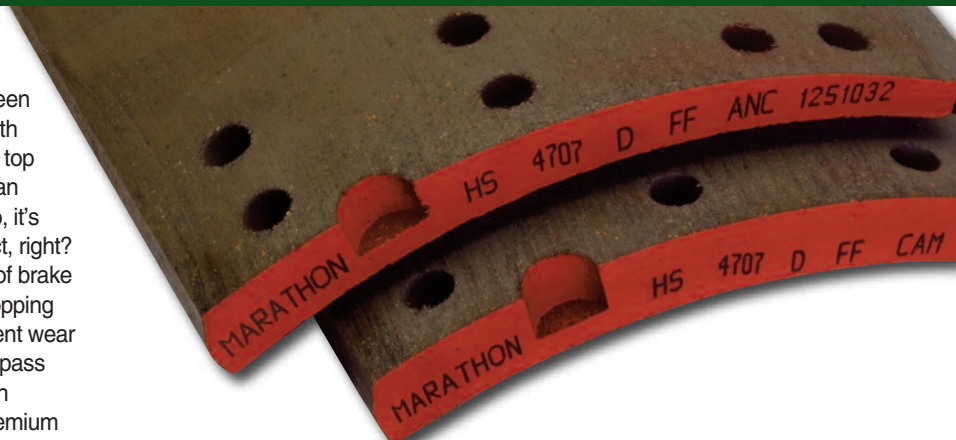
- **State of the Art Assembly Cells** – all of our New lined shoes and wheel end kits are riveted and assembled in Marathon's Cartersville, GA warehouse
- **Quality Components** – our hardware kits contain stainless steel bushings, heat treated and zinc-chromate coated rollers and powder-coated springs, designed to be rust resistant and improve the dependability of your brakes
- **Hardware Kits** – are built to OEM industry standards
- **Heavy Duty Springs** – tested to 1,000,000 cycles versus competitors' average of 150,000 cycles, our true heavy-duty springs are certified to 125 ft/lbs resistance

Premium vs. Economy Grade Brake Linings

For many years fleets have wrestled with the trade-offs between specifying a premium grade brake lining vs. saving money with an economy grade friction material. Today, a friction kit with a top performing premium brand lining like Marathon's Heat Star can cost almost twice as much as an economy grade product. So, it's got to be tough to justify going with that top-of-the-line product, right?

Wrong! You start with the lining's performance features of brake fade, effectiveness and power that give you confidence in stopping power and recovery. Add in the lining's durability and consistent wear characteristics and you become more comfortable that you'll pass unexpected brake inspections. And of course there's the often overlooked drum compatibility and wear factor. Ok, so the premium grade lining will perform better, but we still must deal with cost. And twice as much is hard to justify.

Or is it? Industry leading friction material's like Heat Star deliver a long lining life that can help you extend brake reline cycles. For example, in a typical varied 23,000 lb. application, Heat Star will run 500,000 to 600,000 miles before needing to be replaced. A typical economy grade lining will wear out after 250,000 to 300,000 miles. As the Return On



Investment (ROI) analysis below shows, a longer service life with a drum friendly lining like Heat Star will actually save you significant money over a typical 3 year maintenance cycle.

Before your fleet spec's an economy grade lining, be sure they understand how to save REAL money by going with an industry leader like Heat Star!

Premium vs. Economy Grade ROI Analysis

Example below based on a married tractor and trailer (5 axles, 23,000 lb. rating) with a three year maintenance cycle traveling 750,000 miles.

	Economy Grade Friction 2 brake jobs		Heat Star™ Premium Grade 1 brake job	
Friction Material	\$37.00/friction kit (2 lined shoes + hardware kit) x 10 wheel ends \$370/brake job x 2 brake jobs	= \$740	\$65.00/friction kit (2 lined shoes + hardware kit) x 10 wheel ends \$650/brake jobs x 1 brake job	= \$650
Labor and Overhead	10 hrs./brake job x \$50/hr (\$15 labor, \$35 overhead) \$500 x number of brake jobs x 2 brake jobs	= \$1000	10 hrs./brake job x \$50/hr (\$15 labor, \$35 overhead) \$500 x number of brake jobs x 1 brake job	= \$500
Drums Replace drum every other brake job	Replace all drums once \$85/drum x 10 wheel ends	= \$850	No drum replacement	= \$0
	Economy Grade Life Cycle Costs	\$2590	Heat Star Life Cycle Costs	\$1150

Heat Star life cycle savings
\$1440*

* This life cycle financial analysis does not include vehicle downtime and improved tire wear. Both of these issues are positively affected by Premium Grade Friction and could result in significant additional \$ savings.

20K vs. 23K Brake Linings

Should a fleet use 20K or 23K rated friction material on their axles?

Many fleets make decisions regarding the aftermarket friction material that's best for their application based on several misunderstandings. The result is that far too many fleets spec 23,000 lb. rated brake linings for applications that are ideally suited to a 20,000 lb. lining. So let's investigate this further.

The axles on every vehicle have a Gross Axle Weight Rating (GAWR). For most tractor or trailer axles, the GAWR will be 20,000 lbs. (20K) or 23,000 lbs. (23K). Some heavier axles may certify with a GAWR of 26,000 lbs. (26K). Transit busses GAWR are usually 28,660 lbs. Since most tractor and trailer over-the-highway applications have GAWR of 20K or 23K, let's focus our discussion on these.

In the US, the vast majority of axles (70% plus) have a GAWR of 20K. Most of the other applications have a GAWR of 23K, and a small percentage have a higher GAWR for very heavy applications. In Canada, most axles have 23K GAWR and require 23K friction materials.

New Trucks and Trailers:

Most axles on new trucks and trailers have a GAWR of 20K. They are supplied with a friction material that rates at 20K. Truck OEM's do extensive friction material approval testing and require a 10% compliance margin. 20K friction materials are designed to perform very well on axles with a 20K GAWR.

When you have a 20K GAWR axle and you use 20K rated friction material for aftermarket replacement, you will receive optimal results:

1. The friction has been engineered to pull more than enough torque (+10% compliance margin) for the application.
2. The correct friction level for the application will optimize/maximize your lining life, drum life and wheel end component life.
3. The correct friction level for the application will reduce the chance for brake noise and vibration.
4. 20K GAWR friction is generally less expensive than 23K GAWR friction material.

When you use a 23K GAWR rated friction material on a 20K axle you will not receive optimal results:

1. You will pull more torque than you need for the application. The higher friction does not make the material "more safe". With a 20K material on a 20K axle you have plenty of stopping ability.
2. Lining life, drum life and wheel end component life will tend to be shorter.
3. Your chances of brake noise and vibration are much higher with the higher friction material.
4. 23K friction generally is more expensive than 20K friction material.

In summary, Marathon provides both 20K and 23K rated friction materials, and can supply either for any application. However, best maintenance results are achieved when you match the rating of the friction material to the GAWR of the axle for any application.



Lining Cross Reference

Branded Friction FS20 Reference Guide

MFG	20K Premium	20K Medium	20K Standard	20K Economy	23K Economy	23K Standard	23K Medium	23K Premium	Severe Service
Marathon	HS20	FS20	MV20			MV23	FLOE	HS	KVT, TS, MBC, MBS
CM Brake		CBI 08T	CBI 07T	CBI 07T	CBI 9T	CBI 10T	CBI 12T		CBO 12T/63
Cobreq/TMD		NABK102FF	NABK090FF	NABK090FF	NABK091FF	NABK110	NABK110		NABK171FF
Federal Mogul (Abex)	EL 6011	EN 6008	AN 6166	VL20	VL23	AX 6149	EX 685	SDA 6098	SDA 6098 SM/6098
Fras-le		AF555	AF550	AF540, AF520	AF523	AF555	AF557		AF560, AF560/555
Haldex		GR 2015	GF 2008	HV77 GN 2017	HV88 GD 2016	GH 2023	GG 2020		GC 20/35 GZ 2035
Meritor		MA212	MG1 M20	EG, P20 MV, MG1L	EG2, P23 MG2L, M23	MA312 MG2	MA312 MG2		R403 M25C
Stemco/Duroline		Crest XL	Horizon SP20	Horizon SP20	Horion SP23	Vista HP	Ultra Peak BRT Ultra Peak HH		Vista HP1 Ultra Peak FT

Private Label Friction Cross Reference Guide

MFG	20K Premium	20K Medium	20K Standard	20K Economy	23K Economy	23K Standard	23K Medium	23K Premium	Severe Service
Marathon	HS20	FS20	MV20			MV23	FLOE	HS	TS, MBC
BSFB (Bendix)		Silver Supreme Blue	Silver	Green Black	Red	Yellow	Gold		Orange
FleetPride		OTR BLUE	OTR BLK	OTR BRZ	OTR GREEN	OTR RED	OTR ORG, SLV		OTR GLD
Gorilla Brake			GB20PR	GB20STD	GB23STD	GB23PR			GB23HDC GB23HD
H.D.A.			HDA20	HDA20F	HDA23F	HDA23	HDA23		
PACCAR			STD20 PR20	ECON20	STD23	STD23 PR23			SS23
TruckPro			Armada AR2	Armada AR1	Armada AR2	Armada AR3	Armada AR4		Armada CM

Transit Brake Lining Comparison Guide

	Meritor "W" Brake			MAN Axle		Meritor "Cast Plus"	
Brake size	14.5 X 6"	14.5 X 10"	14.5 X 10"	16.140 X 6.420	16.140 X 8.780	16.5 X 6"	16.5 X 8.63
G.A.W.R.	14,600	25,000	26,000	14,600	28,660	14,600	28,660
MARATHON							
HST	X	X	X	X		X	
MBST	X	X	X	X		X	
KVT	X	X	X	X	X	X	X
BRAKEPRO							
CM22A-1	X	X	X				
CCM2429	X	X	X	X	X	X	X
MERITOR							
AF557	X	X	X				
AF787	X	X	X	X	X	X	X

New Regulations

RSD - Reduced Stopping Distance

In an effort to significantly reduce road fatalities involving commercial vehicles, the NHTSA has instituted regulations to reduce FMVSS121 stopping distances from 60 mph for commercial vehicles closer to those of the other road vehicles.

Implementation of the new regulations began with 2012 models effecting only new class 8 tractors. The new ruling represents a reduction of 30% in stopping distance. The graph below explains the old versus new stopping distances for various vehicle axles, unloaded and loaded vehicles.

Brake friction material plays a vital role in achieving the new stopping distance. Half of the reduction comes from increased friction output while the other half comes from the steer axle change from 15 x 4 in QP brake to 16.5 x 5 in QP (chamber from type 20 to 24). Drive axle brake will remain 16.5 x 7 in QP or move to 16.5 x 8-5/8 in QP. In other words, half of the reduction will come from the brake and chamber size change in the steer axle and the other half from increase in friction output.

Requirement for RSD Materials

Currently there are NO Federal Motor Carrier Safety Regulations governing aftermarket friction materials or performance requirements. End users are not required to verify their vehicles met the new stopping distance requirements.

However, ALL Marathon aftermarket friction materials will work fine on vehicles produced after the Required Stopping Distance date. Simply match the GAWR with the appropriate product, as you always would have. In most cases, the Marathon product will yield performance enhancements, including better lining life, less fade, less noise and increased brake power.

New Regulations for Stopping Distance to Implement Began with 2012 Models

Date of Implementation	Vehicle Type	Tractor GAWR (lbs)	Old Distance		New Distance	
			Unloaded	Loaded	Unloaded	Loaded
August 1, 2011	3 Axle Tractor	Up to 59,600				250 ft.
	3 Axle Tractor	59,600 – 70,000				310 ft.
	3 Axle Tractor	Above 70,000	335 ft.	355 ft.	235 ft.	310 ft.
August 1, 2013	2 Axles	Inclusive				250 ft.
	4+ Axles	Up to 85,000				310 ft.
	4+ Axles	Above 85,000				310 ft.



Marathon Customer Testimonials

What Our Customers Have to Say...

“My lining life has increased by over 20 percent on drive axle shoes and over 50 percent on the steer axles”

“Prior to discovering Marathon Brake linings, my fleet had chronic issues with rust jacking leading to premature removal of the brake shoe. Although I tried many different brake products, nothing solved my problem. Once I found Marathon’s Heat Star lining I was completely hooked. Converting to Heat Star has completely solved my rust jacking issues. Since I began using Heat Star 5 years ago, I’ve never had a brake shoe issue, and my lining life has increased by over 20% on drive axle shoes and over 50% on the steer axles. Because I know that Heat Star is a stronger, higher density material, I no longer have concerns about stopping safely, which is important for my fleet - a truckload carrier. Overall, Heat Star has saved me the cost of a brake job over the life of each of my vehicles, which has resulted in a great savings for Houff Transfer Inc.”

Michael Fulk
VP of Maintenance
Houff Transfer Inc.
Weyers Cave, VA



“Marathon Heat Star Doubles Lining Life and Drum Life”

“We switched to Marathon’s Heat Star™ brake block 5 years ago. We operate a general hauling, dump truck operation and are extremely impressed with the product’s performance. Once we began using the Heat Star, our brake lining life more than doubled. Heat Star provides sure, safe, stopping power for our trucks. The product has also allowed us to double our drum life, affording us tremendous savings on our annual brake maintenance costs.”

Mike Dills
Owner
Dills Trucking LLC
Jefferson, GA



“Brown Trucking relies on Marathon’s Floe 23k Brake Lining”

Brown is a heavy hauler that has achieved exceptional results out of Marathon’s Floe, high density, friction material.

“Our operation is a demanding one! Marathon’s material provides us with long lining life, exceptional braking confidence and low cost per mile savings, all of the things that we expect from a worldwide manufacturer of heavy duty friction products.”

Lanny Kimbrell
Operations Manager
Darrel Brown Trucking Inc.
Adamsville, AL.



Website Resources

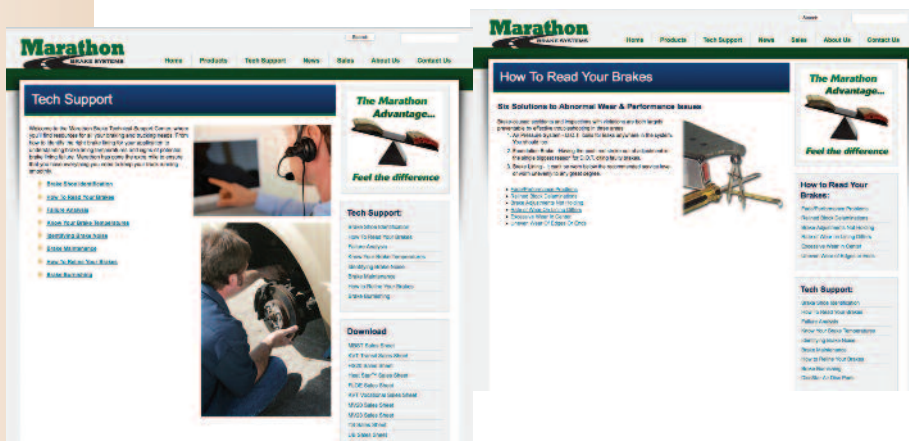
www.MarathonBrake.com

We are proud to have developed a complete website that provides a wide range of information to help our customers review products, use an online application guide, learn about friction material differentiating factors and solve braking problems their truck or fleet may be experiencing.



Technical Resources

Visit the Marathon Brake Technical Support Center and you'll find resources for all your braking and trucking needs. From how to identify the right brake lining for your application to understanding brake lining temperatures and signs of potential brake lining failure, Marathon has gone the extra mile to ensure that you have everything you need to keep your truck running smoothly.

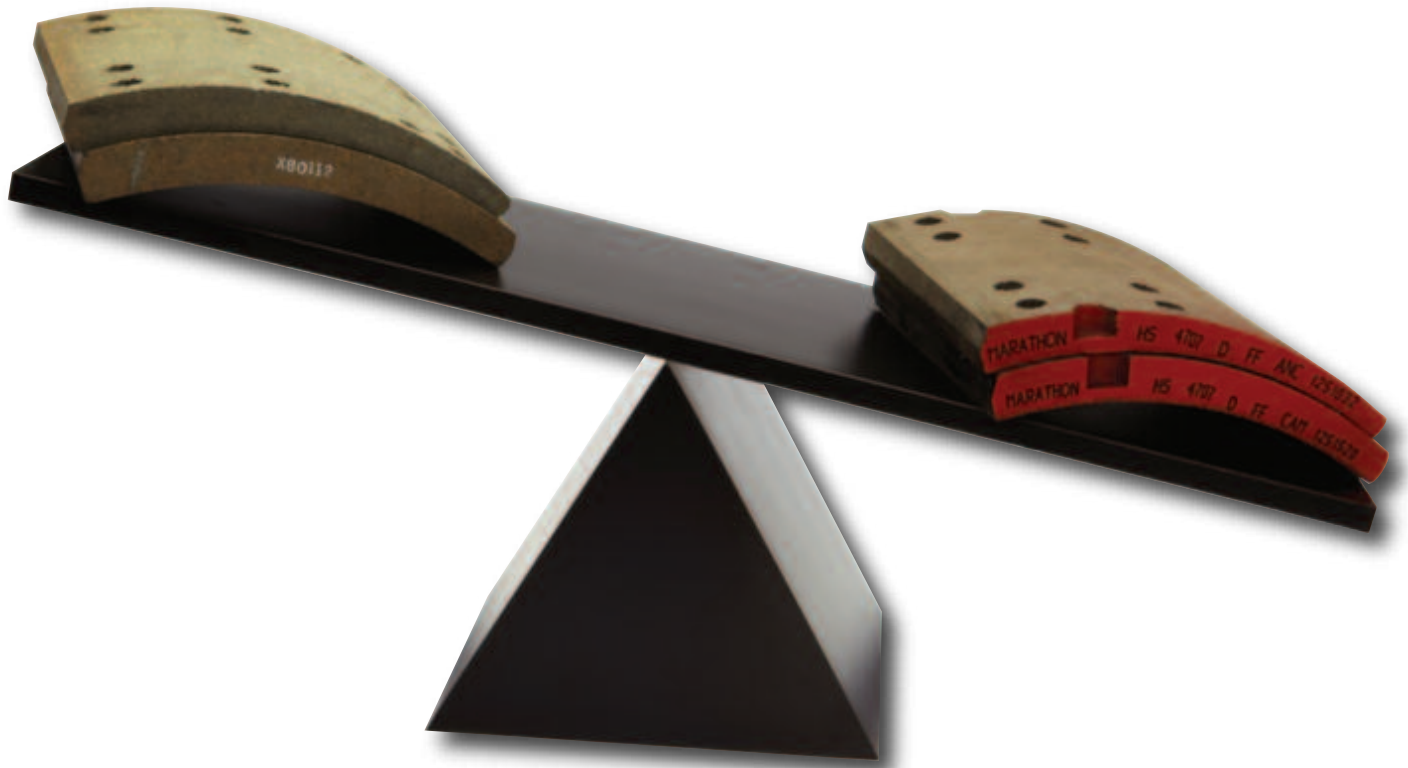


Brake Shoe Identification

One of the challenges all service techs experience when preparing to do a reline job is brake shoe identification. Often the old shoe is dirty, rusted and any identifying markings are no longer visible. The Marathon brake shoe ID section of our website helps you visually determine what type of brake shoes and hardware kits your truck is running.



The Marathon Advantage Hi-Density Friction



***Feel the Difference...
Sell the Difference!***



Marathon



BRAKE SYSTEMS

125 Old Mill Road • Cartersville, GA 30120

ISO 14001:2004

**Call 800.223.5201 or visit
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