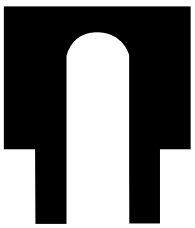
Static Control Anti-Fatigue Mat 9900 Series

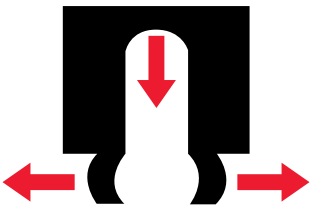
3M™ Static Control Anti-Fatigue Mats enable workers to stand comfortably for long periods while minimizing the fatigue associated with standing work. Manufactured from durable rubber, 3M Anti-Fatigue Mats consist of a matrix of hollow cylinders that function like a spring when compressed. These mats provide a durable cushion that offers secure, stable footing and a unique energizing responsiveness.

Their structure provides a stable surface supported by rubber cells that soften in response to surface activity. These cells provide the most effective cushioning solution because the 3M Static Control Anti-Fatigue Mats get softer as compressed, not harder like products made of foam.

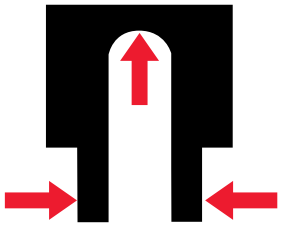
At rest



Under impact



Rebound



Product Number	Description	3M ID Number
9900	3 ft. x 5 ft. (0.9 m x 1.5 m) Static Control Anti-Fatigue Mat	98-0798-5635-1
9910	3 ft. x custom length Static Control Anti-Fatigue Runner	98-0798-5636-9
9920	22 in. Octagonal Shape Static Control Anti-Fatigue Mat	98-0798-5674-0

One 3M™ Ground Cord 3040, 15 ft. (4.6 m) with 10 mm snap is included with each mat.

3M Static Control Anti-Fatigue Mats 9900 Series

Property	Typical Value
Size	Standard: 3 ft. x 5 ft. (0.9 m x 1.5 m) and Octagonal 22 in. (55.9 cm) diameter Runners: 3 ft. width x custom length
Thickness	0.625 inches (1.59 cm) with beveled edge
Durometer	42 Shore A
Weight	2 lbs. per square foot
Composition	SBR Rubber Polymers
Flammability	NFPA Rating (Scale 1 - 4) Fire: 1
Cleaning	Sweep, vacuum or damp mop
Color	Black
Edges	Solid molded rubber
*Resistance Surface to Ground Snap Surface to Ground	 <1 x 10^6 Ω <2 x 10^6 Ω (When connected through 3M™ Ground Cord 3040)
Coefficient of Friction	Greater than 1.0 C.O.F.
Temperature Use Range	-40°F to 180°F (-40°C to 82°C)
Warranty	3 years limited warranty
Chemical Resistance	Water – Excellent Acids – Fair-Good Alkali – Fair Alcohols – Good Oil & Gasoline – Poor Aliphatic Hydrocarbons – Poor Aromatic Hydrocarbons – Poor

*Tested per ESD STMS7.1 at 72° F, 12% RH on 3 ft. x 5 ft. (0.9 m x 1.5 m) mat

Mats are easy to install and can be used at assembly and manufacturing workstations, warehouse and shipping areas, medical laboratories and in field service.

Electrostatic Discharge (ESD) Testing Evaluation

Test Type	Description	Typical Value
ESD STM 7.1	Resistance to Ground Point	2.1 x 10^4 to 2.6 x 10^4 Ohms
ANSI/ESD STM 97.1	Resistance w/Person in Conductive Shoes	1 x 10^7 Ohms
ESD STM 97.2	Voltage w/ Person in Conductive Shoes	3 Volts - Grounded Mat 88 Volts - Ungrounded Mat

Note: Mats were tested by an independent ESD laboratory in accordance with ESD standards as indicated.

Essential Questions to Ask Before Buying an Anti-Fatigue Mat

Has the mat been optimized for softness and hardness?

A standing surface that is too soft can increase fatigue (eg, standing on a mattress). Overly soft surfaces also tend to wear out more quickly. A surface that is too hard or bottoms out easily may be only slightly better than standing on nothing. [1, 2, 3, 4]

3M™ Static Control Anti-Fatigue Mats 9900 Series are engineered to very specific parameters that reflect the latest research on optimal compressibility.

Does the mat provide an adequate balance between instability and stability?

There needs to be enough instability to encourage small postural changes that facilitate increased blood flow to and from working muscles, but not so much that it requires excessive muscular activity that might accelerate fatigue. An extreme level of instability, caused by overly soft mats, increases the risk of loss-of-balance as well as affects overall body posture. Too much instability can increase subtle additional muscular activity as the body works to retain balance, accelerating fatigue levels. Fatigue-induced deterioration in postural stability (balance) may lead to an increased risk of slips, falls and workplace accidents when workers are tired or experiencing discomfort.

Extreme levels of stability, on the other hand, are often found in too-hard mats. Overly soft mats that bottom out, or unusually hard mats, do not encourage subtle muscular activity and increased blood flow to keep the muscles optimally serviced with nutrients and waste removal. Extremely stable mats may also create pressure points causing discomfort and over-fatigue of certain muscles. The optimal balance of instability and stability is critical and works in concert with optimal compressibility. [2, 3, 4, 5, 6, 7]

3M™ Static Control Anti-Fatigue Mats 9900 Series provide a stable surface supported by unstable cells that 'soften' as needed in response to surface activity.

Does the mat resist bottoming out without being too soft?

Although a surface may have adequate compressibility, it must also be appropriately thick. A mat that is too soft and easily bottoms out begins to act like a mat that is too hard because the cushioning material becomes fully compressed.

Current data suggests that mats should have a bottoming out depth greater than 5 mm and a thickness greater than 10 mm. In other words, a mat may have an appropriate ratio: thickness/bottoming out depth, but if it is too soft this value becomes unimportant due to the overriding problems associated with mats that are too soft. Optimal bottoming out depth works in concert with an optimal balance of stability and instability, and optimal compressibility. [1, 4]

3M™ Static Control Anti-Fatigue Mats 9900 Series have been optimized to resist bottoming out without being too soft.

Does the mat adequately respond to worker movements?

A responsive mat should rapidly return to its original shape as weight is shifted. If a mat has a delayed rebound, it will likely already be partially compressed as a load is repeatedly placed on it, reducing its' ability to provide the most effective benefit of its elastic modulus. A surface that is slow to respond is prone to bottoming out.

Adequate responsiveness works in concert with optimal bottoming out depth, optimal balance of stability and instability, and optimal compressibility. [1, 2, 3]

3M™ Static Control Anti-Fatigue Mats 9900 Series technology has been designed to allow the movements of the body, providing a helpful anti-fatigue characteristic.

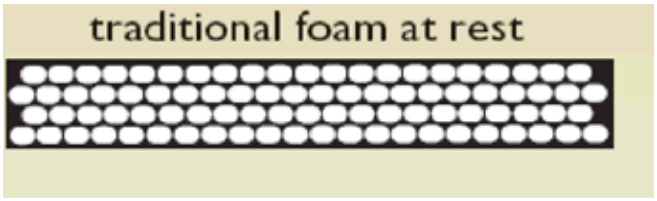
Does the mat balance shock attenuation (absorb energy) and resilience (return energy)?

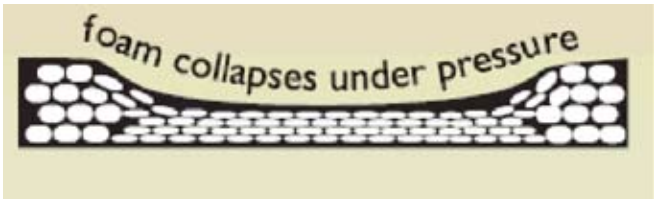
The ability to attenuate or absorb shock without bottoming out ensures that sudden movements on the mat are cushioned adequately. Too much absorption may create the same sensation as standing in sand, which may absorb shock but is very uncomfortable as a working surface. When balanced with the right amount of elasticity (resilience), a mat can result in less discomfort. [2, 3, 8]

3M™ Static Control Anti-Fatigue Mats 9900 Series provide an optimum balance between shock attenuation and resilience.

Does the mat get softer as it is compressed?

There appears to be a popular yet faulty logic that reasons if a hard surface is bad to stand on, then a soft surface is good. In response to this erroneous assumption, many mat surfaces are constructed from foam materials. Regardless of the variations in construction, from domed foam geometries to draped top-covers with various surface textures, there is one challenge shared by all foam-based mats: foam gets harder as it is compressed.





So, if the objective is to provide a softer surface, why do it with a material that gets harder as it is walked on or stood on? On the other hand, some mats are made of difficult to compress materials and lack the advantage of compressibility provided by foam. [1, 3]

3M™ Static Control Anti-Fatigue Mats 9900 Series get softer as they are compressed, without bottoming out.

Does the mat resist movement under use?

A clean, dry floor is one of the best deterrents to a sliding mat, but not always a likely reality. The material from which a mat is made can also contribute to a mat that moves easily across the floor. Some foam formulations break down readily, creating a slippery layer of fine ‘dust’ between the mat and the floor. If these mats are draped with a hard finish, the user may be unaware of the degradation of the material, as the top surface may still look good. Also, many mats are so lightweight that they shift easily.

3M™ Static Control Anti-Fatigue Mats 9900 Series are significantly sturdier than lightweight mats and resist movement yet are easily removed for cleaning.

Is the mat easy to clean?

Foam based mats, mats with rough, domed or uneven surfaces, or mats with through-holes may be difficult to clean, absorb moisture or trap foreign matter, which leads to unsanitary and unsightly conditions.

3M™ Static Control Anti-Fatigue Mats 9900 Series have a surface that can easily be swept or air vacuumed. Mats can be cleaned using a neutral cleaner following the simple procedure outlined in the instruction manual.

Is the mat durable?

The real value of an anti-fatigue solution may be more apparent when analyzing the number of replacement cycles that result over a specified time period. Although it may not be visible to the naked eye, the thin cell walls of foam mats can rupture and lose their elasticity with use, leading to an overly soft condition and a mat that easily bottoms out.

Foam can break down, become ragged and generate particulates over time. Also, mats may be prone to edge damage because of thin edges or material softness. Draped top-covers can curl and tear as they become brittle. Mats with damaged edges create a trip hazard and should be replaced. The edge system of a mat should be designed to be durable so it is not easily damaged.

3M™ Static Control Anti-Fatigue Mats 9900 Series have been designed to last for many years; to resist edge damage, tearing and premature failure of its elastic properties. The mats come with a three year limited warranty.

Summary of optimized mat qualities:

1. Optimized for just the right softness
2. Encourages blood flow in the lower legs
3. Resists bottoming out
4. Provides response to worker movements
5. Balances shock absorption and resilience
6. Gets softer as compressed
7. Resists warping, bunching, and creeping
8. Easy to clean surface
9. Durable structure and edges

References:

The published research of the following scientists was considered in establishing the criteria for these questions:

1. Redfern, M.S. and Chaffin, D.B. (1995) Influence of Flooring on Standing Fatigue, Human Factors, 1995, 37(3) 570-581;

2. King, P.M. (2002) A Comparison of the Effects of Floor Mats and Shoe In-Soles on Standing Fatigue, Applied Ergonomics 33: 477-484;

3. Cham, R. & Redfern, M.S. (2001) Effect of Flooring on Standing Comfort and Fatigue, Human Factors 43: 381-391;

4. Redfern, M.S. and Cham, R (2000) The Influence of Flooring on Standing Comfort and Fatigue, American Industrial Hygiene Association Journal 61: 700-708;

5. Brantingham, C.R., Beckman, B.E., Moss, C.N. & Gordon, R.B. (1970) Enhanced Venous Pump Activity as a Result of Standing on a Variable Terrain Floor, J. Occup. Med. 12(5): 164-169;

6. Krijnen, R.M., et al (1997) Compression Stockings and Rubber Floor Mats, J. Occup. Environ. Med. 39(9): 889-894;

7. Nussbaum, M.A. (2003) Postural Stability is Compromised by Fatiguing Overhead Work, AIHA Journal 64:56-61;

8. Sobel, E., Levitz, S.J., Caselli, M.A., Christos, P.J., and Rosenblum, J. (2001) The Effect of Customized Insoles on the Reduction of Postwork Discomfort, Am. Podiatr. Med. Assoc. 91(10):515-520;

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