

DuPage County Environmental, Safety, Health & Property Loss Control Program

Floor Mats Selection Guide

Purpose: Provide a guide for selecting the appropriate floor mat for the exposure.

Mats can be used to increase comfort and prevent accidents. To help choose the right type or style, consider why a mat is needed and what it's intended to do.

Coefficient of Friction: Coefficient of Friction (COF) is a multiplier or factor that is used to determine how much force must be applied before an object slips. Essentially, the higher the number, the greater the amount of traction you'll have. OSHA suggests using a COF of 0.5 as a minimum on flat surfaces. The ADA recommends 0.6 on flat surfaces and 0.8 on ramps.

Compression Deflection: This is one way of measuring the softness or comfort level of a sponge mat. It measures how much a person's foot sinks into the mat - the higher the reading, the softer the mat. The results are affected by the thickness of the sponge backing and the flexibility of the surface material. Some consider 0.20-0.5 to be the ideal range. The test is ASTM D575.

Durometer: The measure of hardness/softness of molded rubber and molded PVC mats. As a general rule, the lower the Durometer, the softer the mat. Typical mats range between 45 and 70 Durometer; some consider 45-65 to be the ideal range for molded rubber mats. The test is ASTM D2240.

Types of Mats

Entrance Mats:

Entrance mats absorb soil and water and help keep soil at the door and out of the building. The International Sanitary Supply Association (ISSA) has estimated that 70 percent to 80 percent of dirt comes in the front, back, side, and service doors of a facility. Entrance mats capture, hold, and hide 85 percent of that dirt. Uses an entrance mat to help reduce contaminants and keeps your facility clean.

There are four things an entrance mat should do:

Stop soil and water at the door. Most mats claim to do this. The most effective mats provide a combination of scraping and wiping to stop the maximum amount of contaminants.

Store soil and water for removal. The most effective entrance mats pull soil and water away from the surface. It is important that the design offers appropriate absorption and ease of removal when the mat is cleaned. Water that flows off the sides of the mat is referred to as seepage. Mats with flat borders allow water to seep off the edges, creating slippery conditions that can lead to a slip or fall. Water seepage can also cause floor damage. High-performance mats provide a dam that will pull the water back from floor surfaces and prevent sticking to shoes.

Minimize tracking of soil and water. The amount of soil that a mat allows to be tracked back to patrons' shoes is commonly referred to as the performance threshold. The best mats employ bi-level construction, trapping large quantities of moisture and dirt, and pull it away from the surface so it can't

DuPage County Environmental, Safety, Health & Property Loss Control Program

Floor Mats Selection Guide

be tracked further into the facility. Low-performance mats such as those with a ribbed or square patterned face yarn alone will not hold up under foot pressure, allowing more water and dirt to reattach to shoes and be tracked into the facility. High-performance mats have a permanent rubber reinforcing membrane that permanently support the textile face increasing product unity and extending useful product life.

Provide a safe surface. The mat should be slip-resistant to help prevent slips. Any water on the mat should be contained in a reservoir below the traffic surface. Rubber-backed mats provide a better slip resistance than vinyl-backed mats. Rubber-backed mats do not curl as do vinyl mats, helping reduce trips and falls. Cleated surfaces enhance non-skid qualities and allow moisture to dry from underneath.

Entrance mats may also be scraper mats that provide the first line of defense against soil. Scraper mats should always be used with other entrance mats that will provide wiping properties to remove fine soil and water from feet.

It is suggested that at least 15 feet of matting is required to remove the majority of dirt and debris from foot traffic. 15 feet of matting ensures that each foot will make contact with the matting at least 3 times, providing adequate scraping and drying to stop most dirt and moisture at the entrance. Using the 15 Foot Rule can help keep dirt out of your facility. Between 70 and 80% of all moisture, dirt and debris are brought into a facility on the bottom of people's shoes.

Interior Mats:

Interior mats perform many tasks. In many cases, they are used as dust control or finishing mats when used in conjunction with a scraper entrance mat in a soil management program. They are usually made with a nylon textile surface that will provide good wiping characteristics.

Nylon is typically used over olefin because of the high twist level of nylon fibers, which allows the mat to more effectively remove soil and spring back up after cleaning. Olefin mats can crush out in as little as 30 days rendering the mat virtually useless.

Other uses of interior mats include spot, spill and soil control in high-use areas such as near vending machines, coffee service areas, copy machines, registration areas, etc. It is important that mats used in these areas provide safe footing that minimizes trip and fall hazards as well as slip resistance. The best interior mats are made with a rubber backing that will resist slippage on any surface, e.g. carpet or hard surface/tile.

There are also specialty interior mats designed to provide enhancements to the environment by controlling the growth of microorganisms that can be disease bearing as well as odor causing. This is done by special additives or treatments that are incorporated into the mat during manufacturing.

Anti-Slip Mats:

DuPage County Environmental, Safety, Health & Property Loss Control Program Floor Mats Selection Guide

These mats are engineered to provide safe footing with minimum movement in any environment. Typical placement includes outside entrances, ramps and floor areas where contaminants such as oil, grease or water are common. For maximum safety, these mats should be designed for minimum slippage on any surface. In addition, the mat surface should be constructed with maximum traction properties. Another use of industrial mats is to protect the floor from contaminants such as food and liquids.

Anti-Fatigue / Ergonomic Mats:

These mats are commonly used to provide cushioning for workers that do their job while standing on hard surfaces. Adding anti-fatigue or ergonomic mats help provide an environment that encourages optimal performance. This promotes productivity, which is the ultimate goal of ergonomic design.

Researchers that have studied the effects of long-term standing on hard surfaces have found that it negatively affects workers' productivity and health. Standing on hard surfaces is uncomfortable because leg muscles become static and continuously flexed to keep the body in an upright position.

Standing for long periods reduces the natural flow of oxygen and blood back to the heart, which can cause fatigue and blood pooling in lower extremities. Common ailments that result could be varicose veins, low back pain, leg pain and fallen arches.

Anti-fatigue mats work by encouraging subtle movement of the leg and calf muscles. As the muscles contract and relax, they pump blood back to the heart and eliminate blood pooling in the lower extremities which often occurs if a worker's muscles are totally static.

Presently, OSHA has not set forth any standards regulating anti-fatigue mats; however, anti-fatigue mats may be used in an ergonomic program to help eliminate MSD (Musculoskeletal Disorders) problems. For more in-depth information please refer to the proposed OSHA 29 CFR 1910.900.

DuPage County Environmental, Safety, Health & Property Loss Control Program

Floor Mats Selection Guide

Custom Logo Mats:

Logo mats are available in constructions that allow them to be used as entrance mats or interior mats.

Logo entrance mats should be made with the same construction as non-logo entrance mats in that they should provide the soil and water stopping and storage or scraping properties inherent in the best entrance mats. One of the most common misapplications of matting products is the use of interior logo mats at the entrance to a facility.

Since interior mats do not provide the permanent bi-level construction required in an entrance mat, these mats can become saturated with soil and water and become a source for contaminants. The result is a mat that allows water to seep onto the floor around the mat causing unsightly and unsafe conditions. Interior logo mats are designed for dust and moisture control in conjunction with a planned matting program of scraper and entrance mats.

Non-Conductive Mats:

Most commonly called switchboard matting, non-conductive mats insulate workers, protecting them from deadly shocks generated by high voltage equipment. Most often, these mats meet:

ASTM D178-01 specifications

Military 15562F specifications

These mats are tested and proven to have a high dielectric strength. However, to provide a large margin of safety, the maximum recommended voltage exposure is much less. This is important since the switchboard mats are true safety mats, designed to save employees lives.

Static Control Mats:

Conductive mats are designed to control the risk of static discharge by quickly draining it from workers. Electrically Conductive and Static Dissipative mats eliminate hazards and protect sensitive equipment from static electricity. Conductive mats disperse static electricity quicker than static dissipative mats. Conductive and dissipative matting must be grounded to be effective. Heel grounders must also be worn to allow the static to drain off the body and through the mat.

Critical Environment Mats:

Critical environments are those where cleanliness is important. Cleanliness can be determined by the amount of dust and debris, biological contaminant, or both. A tacky mat is much like tape with the sticky side up. It acts the same way, and debris literally sticks to the mat. Alternatively, a mat that is in a medical environment, for example, may need to be cleaned of biological contaminants. A common and effective sterilization method is autoclaving, and mats like these can be autoclaved.

DuPage County Environmental, Safety, Health & Property Loss Control Program

Floor Mats Selection Guide

Chemical Resistance: Contact the manufacturer who will help in determining the right mat for the chemicals it will be exposed to.

Life expectancy of a mat:

The life expectancy of a mat can vary dramatically depending on a multitude of factors such as: number of shifts per day, amount of foot traffic, exposure to oils, caustic chemicals or fluids, excessive temperatures, cleaning and maintenance schedule, compound, etc. The following is general representation of what you may experience (which may vary):

5 Years or more - Urethane Mats (Ex: Rejuvenator®)

3 to 5 years - SpongeCote® Mats (Ex: Diamond-Plate SpongeCote®) and Injection molded PVC (Ex: ErgoDeck®)

2 to 3 years - Molded Rubber Mats (Ex: 24/Seven®)

6 to 12 months - PVC Sponges (Ex: Sof-Tread)

Acceptable matting dimensional tolerances:

Acceptable tolerances vary by product type. For example, mats made with strips of recycled tires may be as much as three inches longer or shorter than requested due to the materials used and the manufacturing process. In the case of runner matting, it is widely accepted that the matting may be 1 to 1 1/2" narrower than specified. Length is not always exact either. Certain materials have a tendency to shrink and others to expand depending on the weather conditions and the manner in which they are packaged.

Difference between a Conductive and a Non-conductive mat?

The differences are:

A conductive mat protects sensitive equipment by drawing static electricity off workers before they touch susceptible chemicals or apparatus. Humans quickly generate static electricity through the friction caused by walking or using chairs with casters. Then with a simple touch, this static electricity is passed to sensitive equipment such as a computer. One such shock can destroy internal microchips or cause a spark that can ignite flammable chemicals. However, if the person steps onto a conductive mat before touching the equipment, the static is conducted off his or her body, and out the mat through the grounding snap. Most commonly called switchboard matting; non-conductive mats insulate and protect workers from deadly shocks generated by high voltage equipment. (This type of electrical shock is dangerous because it has high amperage.) These mats will not allow the electricity to conduct through the worker, and hence protects workers from serious injury.

DuPage County Environmental, Safety, Health & Property Loss Control Program Floor Mats Selection Guide

Employees still get static shocks when using a conductive mat what is the problem?

The mats are not grounded. Every electrically conductive mat has a snap to connect to a ground cord which then must be grounded to an electrical outlet or similar conduit. If the mat is not grounded there is no place for the static electricity to go. The employees will still be able to pass it on to the equipment.

The employees have insulated shoes and are not wearing heel grounders. Most shoes have soles that are not designed to conduct electricity, e.g. any shoes with rubber soles. In order to allow the static electricity to flow off the employee, he or she must wear heel grounders and the long fabric strip must touch his or her skin.