

Stall Floor Setups

How to choose, install, and maintain your stall or shed floors to maximize horse comfort and chore convenience

Stall flooring might not be something we spend much of our horsey time pondering, but it's crucial to our horses' health. Like humans, the surface a horse spends hours standing on can affect his comfort, soundness, and quality of movement. Stall flooring also affects how efficiently and thoroughly you can clean the stall—which, in turn, can affect horse health if ammonia accumulates in the airspace or dirt collects on surfaces on which they eat.

Flooring Types

There are two basic categories of stall flooring: pervious and impervious. Pervious, or porous, stall flooring can either be traditional packed clay, or it can include a specially designed geotextile membrane. In the latter case, the membrane layers separate the horse and bedding from the base material below. Regardless of the type, you should place pervious materials on a base of well-graded crushed and packed stone.

There are drawbacks to using pervious flooring: Packed clay is soft (compared to cement or asphalt), but it can easily become uneven with added moisture, especially if you don't apply deep bedding. Membrane layers can contribute to urine and moisture buildup in the base material below, resulting in odors. Groundwater contamination is another concern with this type of stall construction.

Impervious stall flooring is designed to prevent urine and moisture from draining. The horse either has access to an outdoor area for defecating and urinating or bedding to absorb moisture and provide cushion.

Eileen Fabian, PhD, is a professor of Agricultural and Biological Engineering at Pennsylvania State University, in University Park. She has authored books



ALAYNE BLICKLE PHOTOS

Stall mat benefits include cleaning convenience, reduced bedding costs, and horse health and comfort.

and bulletins on building and maintaining horse and livestock housing, drawing on her expertise in air quality, agricultural heating and ventilation systems, animal welfare, and horse facility engineering. Stall flooring is more than what's on the surface, she says.

"The thing about stall flooring is people usually obsess about the top layers, but that's only the icing on the cake," says Fabian. "You need to have the whole layer cake underneath for it to work correctly. The flooring in a stall is something like building an arena; there's the base layer and the layer or material on top. If the base isn't correct, nothing else is going to work right."

Decide how you intend to use your stalls before designing the flooring. Will

your horses be confined in box stalls for most of the day? If so, do you plan to bed the stalls deeply for comfort? Will the stalls have attached pens or paddocks horses can access at any time? Is the proposed flooring in a shelter or run-in shed in a turnout or pasture?

"If you are only using the stall for feeding or as a run-in shed, the flooring doesn't need to be as durable as when horses are stalled all day," says Fabian. Base your flooring choices on how much you plan to stall your horse.

Rubber stall mats "are the gold standard in the industry for overcoming hardness and facilitating cleaning," says Fabian. Over time, manufacturers have engineered stall mats to help reduce fatigue in horses' legs and make

stall cleaning easier. Cleaning a stall with smooth, flat stall mats simplifies the task of sorting manure and soiled bedding. You can complete the chore faster and have more clean bedding left behind. Stall mats also reduce the amount of bedding you use or allow you to bed only in a corner area “potty spot.” All these factors can be money-savers.

Choose rubber mats that are at least three-fourths of an inch thick—thinner mats tend to migrate and wear with traffic. You can place stall mats over cement or 4 to 5 inches of highly compacted road mix or another crushed rock product such as limestone. A properly installed rubber mat should be level and firm, while providing some “give” for cushion.

“Mats with ribs on the downside will help with some drainage and grip to keep in place,” Fabian says. “A textured surface (on top) keeps horses from slipping. Use enough bedding to keep urine from getting underneath.”

Rubber mats can be pricey, but they



Effective stall base materials include cement or 4 to 5 inches of highly compacted road mix (shown) or other crushed rock product.

pay for themselves in stall cleaning convenience, reduced bedding costs, and horse health and comfort over time. You can find many varieties and styles on the market, including interlocking mats and custom wall-to-wall installations. Stall mattresses—waterproof pads of varying densities that add more cushion and insulate against cold floors—might be options for stalled horses and those prone to hock

or fetlock sores. Some stall mattresses extend wall to wall, while others are meant to be placed in the center of the stall where a horse is most likely to lie down.

In some situations, you might place a drain in an impervious stall to collect liquids. “A stall drain would be important for a vet or maternity stall that is frequently washed down,” says Fabian. “A drain should not be placed in the middle where

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the horse will lie. Instead, locate it toward a wall,” and grade the stall accordingly.

If you do install drains, place cleanout traps in them to catch and remove solid material, she says.

Troubleshooting Flooring Problems

Not all stall floors are perfectly even, safe, and maintenance-free. Here are four issues you might encounter and how to address them.

Stall mats curling up This is usually a base management issue. Crushed road base should be made up of variable-sized angular pieces, so it can pack tight. If possible, avoid sand, pea gravel, other round rock, or even straight run gravel, as it will be too loose to pack down.

As mentioned, stall mats less than ¾-inch thick are prone to moving around. Cutting and fitting mats tightly in place is key to keeping corners snug and secure. You can also use a bolt with a flush, rounded top to fasten mats to a concrete floor safely.

Horses wearing holes in stalls If your horse is wearing holes in his stall floor, first explore whether it’s a training or environmental enrichment issue or a flooring material issue, says Fabian. Is the horse bored? Does he need more turnout or pasture time? If he’s not spending a significant amount of time indoors and is still wearing holes, you might consider different flooring types.

Historically, hard pack clay was the standard stall floor material, but one of the challenges with clay or dirt is it gets wet from urine. Once wet, “soil loses its ‘bearing strength,’ and anything heavy sinks in, creating a trench or pothole,” Fabian says. Keeping stalls dry by using absorbent bedding, cleaning frequently, and checking for roof or other water leaks will help prevent holes.

An impervious surface, such as a concrete apron around the stall door, high-traffic areas, or even across the whole floor, can prevent holes, as well. Any properly constructed flooring with stall mats on top, however, should be resilient enough to withstand pawing and traffic.

Uneven ground Correct this situation by renovating the stall surface using one of the aforementioned materials. If you choose to install mats, first level the ground with a base of crushed road mix, then compact it before fitting the mats on



Cutting and fitting mats tightly in place is key to keeping corners snug and secure. You can also use a bolt with a flush, rounded top (right) to fasten mats to a concrete floor safely.

top. Correctly installed, level stall mats are much better on your horse’s body than an uneven, damp stall surface.

Air quality and ammonia issues Odor issues usually occur when you don’t remove urine and feces from the stall fast enough. Moisture—which could be from urine, rain, or a leaking waterer—combined with feces creates that ammonia smell. Anything wet that mixes with manure

will contribute to ammonia volatilization and odor. The solution? Check for roof and waterer leaks, use enough absorbent bedding to capture urine, and clean thoroughly daily. You can also purchase stall products that absorb ammonia.

Take-Home Message

Build your stall flooring from the base up. Choose one that is easy on legs, with enough give to minimize tendon and joint strain. Be sure you can effectively keep the stall dry to avoid odor issues. The ideal flooring is one that’s smooth and even for stall-cleaning ease but still offers traction and comfort that encourages the horse to lie down. 🐾

Want to Learn More?

Find out how to install rubber stall mats at TheHorse.com/135670, and read up on stall bedding selection criteria at TheHorse.com/182188.




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