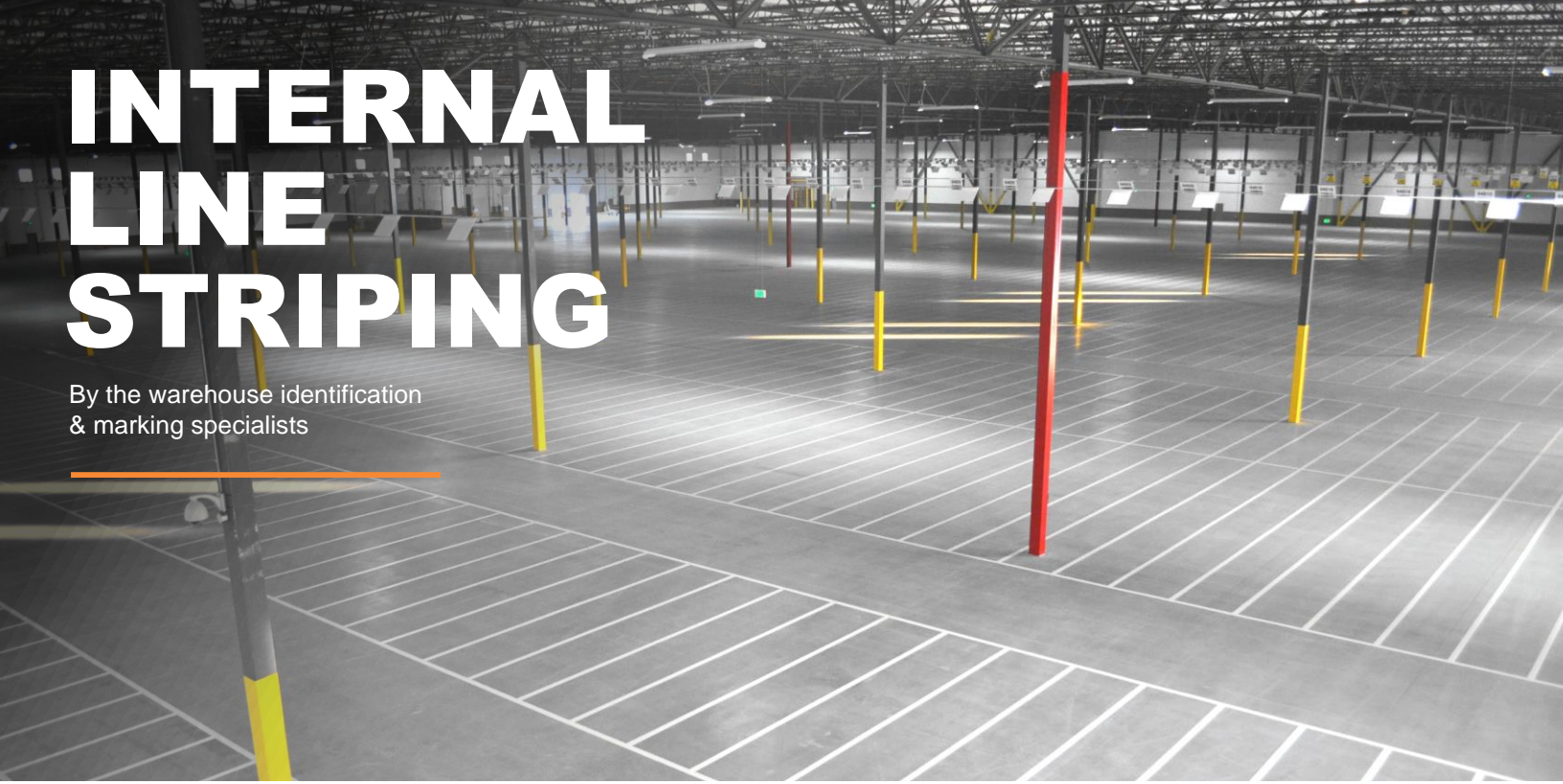


INTERNAL LINE STRIPING

By the warehouse identification
& marking specialists





Advanced organization, improved safety and workflow routing are typically the key reasons for companies who need floor striping and markings.

Once a business identifies the need and sees the potential return on investment, the next step is simple, right? Well maybe not once you begin the planning process. You know the floor needs to be painted, you know where the storage areas are, you might even know where to position the pedestrian walkways. Even with these confirmed, the decision-making process has only just started.

Proposed markings need to be checked with all departments and people involved. Creating your own plan without checking with others can result in complaints, reduced productivity, and discontent. Discussions, involvement, and collaboration can draw on experience, ideas and improve working plans, not to mention helping to avoid costly mistakes.

Test and observe how those markings could improve or restrict workflow. This will help you determine or confirm the exact location and preferred design for the long-term. It will help limit costly reconfigurations and give you the option of having highly durable markings from the start which is much more cost effective in the long term.

Which brings us to the budget, just how will you include all the required striping configurations, markings, text, numbering, and designs with the

budget allocated. Is cheap good enough? Will the expensive option be too durable or cover all that is needed?

What if I want to change something later?... Will the durable option be too durable?..... What if I just can't make this all work?..... Should I just tape it?..... STOP, before you break into blind panic and run for the hills.

Let's start over. Take your facility for a moment, it may be referred to as a warehouse, distribution center, fulfillment operation or something else. Either way, they are typically identified as storage facilities, where goods are held for short or long periods, before they are needed. Regardless of the speed the goods move through your facility, the building and layout should always be optimized to maximize capacity and ease of movement. Both will improve profits and provide your customers with a more reliable service.

If you are reading this, you already treat efficiency and safety as an important operational need. The well-being of your employees should be your priority, not just to keep them safe, but to ensure they know they are valued and respected. This will return greater benefit than most other things, through motivation and enhancing their willingness to work to the best of their capability.

Get Focused

Let's begin with what you are trying to achieve. Organization, optimization, safety, or a combination? In fact, they are all linked. Optimization is derived from improved organization which increases safety by creating official passage routes. It is the design of the markings which then specify where people should walk, where products should be placed and where trucks operate. Details matter, which is why it's important to keep focused on the needs of the company.

The most common purpose of line striping is to maximize a facility's storage capacity while improving or maintaining workflow.

Space is valuable, so you might start by determining your preferred pallet size, this will be a factor of the SKU and/or inventory dimensions held by your firm, or the number of pallets taken from or loaded onto the vehicle. It might be useful to start a drawing. A basic drawing is fine for now, or a CAD drawing if you have the resource. On your drawing, position your bays in the preferred locations, decide how much room is needed for forklift trucks to navigate the area at the same time, as well as any pedestrian access needed in that area and add the routes accordingly. This should take more than five minutes, so take your time gathering the details.



Now you have these elements, consider other items such as:

- Sanitation line around the facility,
- Fire escape access points,
- Loading bay work areas,
- Repack zones,
- FLT charging areas,
- Meeting points,
- Pedestrian routes,
- Crossing points, etc.

Most of these may be needed in your facility and although they may not seem critical, they can take up valuable space. Giving them due consideration early on will help you reduce the space impact they could have later in the process.



As your drawing takes shape, you will have a clearer picture of the markings needed and where you would like them to be. A great way to help visualize the markings is to place some adhesive tape on the floor in areas you have in mind. This will show the actual space and how it configures with other markings and aisles.

If you have not put something down on paper because you don't have time, or you do not want to because you are unsure about it all, perhaps you should consider a service partner. There are several companies out there who can depict, layout and visualize your facility to maximize your asset. ASG Services is one that can help here. This process identifies possibilities and opportunities in your workspace.

OSHA & Standards

Floor striping standards issued by The Occupational Safety and Health Administration (OSHA) do not exist. They can't, every facility, business and environment are different, OSHA cannot be expected to get it right for every situation, which is a fortunate thing as it gives you flexibility.

OSHA provides guidelines on how organizations can help improve the health and safety in warehouse and distribution centers, so working with them is important and critical in some cases.

So, what does OSHA say:

When using aisles and passageways to move materials mechanically, workers must allow sufficient clearance for aisles at loading docks, through doorways, wherever turns must be made, and in other parts of the workplace. Providing sufficient clearance for mechanically-moved materials will prevent workers from being pinned between the equipment and fixtures in the workplace, such as walls, racks, posts, or other machines. Sufficient clearance also will prevent the load from striking an obstruction and falling on an employee.

Employers must ensure that all passageways that workers use remain clear of obstructions and tripping hazards. Workers should not store materials in excess of supplies needed for immediate operations in aisles or passageways, and employers must mark permanent aisles and passageways appropriately.

Material Handling and Storage, OSHA 2236, 2002 (Revised), Pg 17.

No specific guidance on aisle and passageway widths exists, but OSHA does suggest colors which might be applied to floor striping. However, these are not specific to floor striping.

Therefore, overall design and final layouts are left to you. You are the expert of your warehouse and distribution center. ASG Services can provide ideas and suggestions, but unfortunately not certified advice as the company is not a safety specialist.



Solutions providers such as ASG Services might recommend general guidance such as:

- Pedestrian passageway – Typically created using tramlines or as a solid coating. Popular colors include yellow and green. Standard widths are 4ft.
- Pedestrian stencils or floor graphics – These identify the passageway and are particularly useful when a passageway runs alongside a forklift aisle.
- Hatch areas – Generally colored red, these present a non-storage zone where access is always required. Typically used around exits and access points.
- Fire exits – 5ft square markings with hatches, diagonal stripes and/or solid blocks help to portray the importance of keeping these areas clear. They also help operatives identify exit routes. These are generally red in color.
- Dock bays – Dock plates which create steps are a danger to those working in this area, typically customers request that a 1ft wide stripe be placed around the edge to highlight this hazard, usually in yellow.

Staging lanes, numbering, and storage lanes improve storage efficiency and are typically based on pallet sizes, truck, and forklift truck sizes.

Durability vs Cost

Your drawing is an example of your future workplace. It shows the major step forward your company could take, through safety and optimization and improved workflow. Your focus should now switch to how long you want that configuration to last for.



This is important for the product selection stage and budget management. The longer it is needed, the more durable it should be and therefore, the cost increases due to the additional work involved. Identify areas of high traffic, and consider the most durable options for those, while low traffic areas can use cheaper less durable alternatives. This is good practice for stretching your budget.

Find the right company to work with. This sounds simple, right? Internet search, call them in and place your order....? Not quite. Although there are lots of good companies out there, find ones with more than one application method and who specialize in internal solutions. They will provide the best advice, not the only one they know.

Recommended for use with



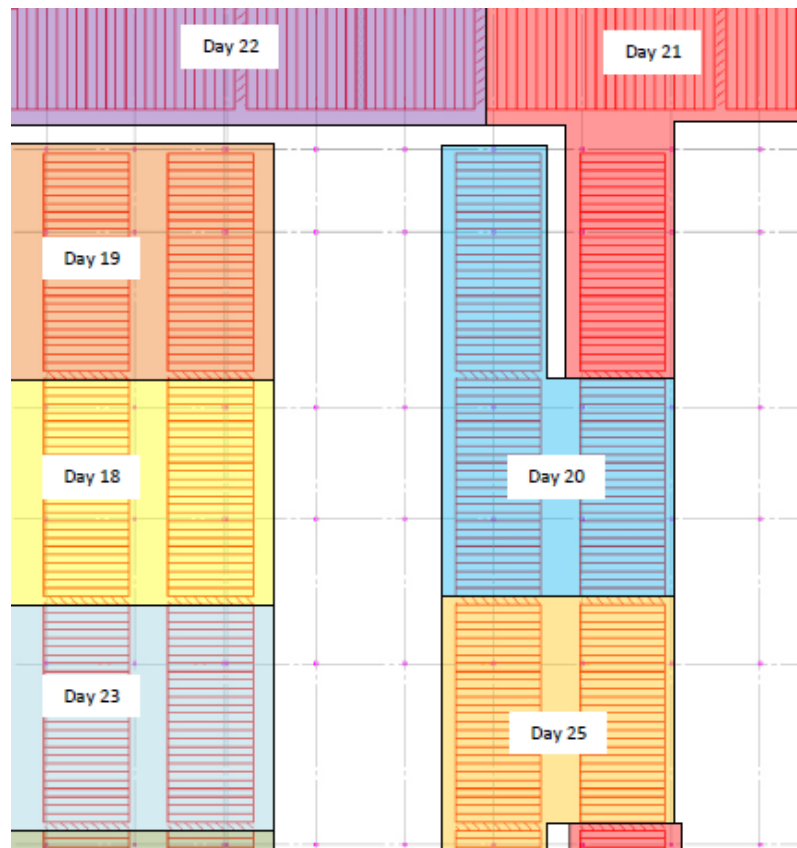
Light forklift traffic

Medium forklift traffic

Heavy forklift traffic

Using ASG Services as an example, we sell, plan, and install almost every option of line striping available for internal floor marking. The reason we sell them all is simple, we are here to gain, maintain and help our customers in achieving their needs. If a customer has a limited budget, we can select various options to maximize budgets and offer the most appropriate because we are not focused on the order value.

Our teams are experienced with all the solutions, furthermore, we know how to work with the customer. Most customers have operational facilities, few have brand new empty buildings, so we can provide schedules of work to ensure we make swift progress without disturbing the operation, or at least a plan to help you work around us, and us around you.



Floor Tape

Floor tape has been the cheapest option for years, but it never really lasted very long, so some clever people came up with the crazy idea of making tape more expensive. Fortunately, this was where clever got very clever, they turned floor tape into a real alternative to paint by making it more durable.

The cheap PVC tape is still a great temporary or test solution, however the thicker floor tapes are a much more serious option to providing durable markings. If the floor is clean, smooth and the tape is respected, there is no reason it shouldn't last for a significant time.

However, and here is the crunch point, durable tapes are only as good as the application was, and... they can be quite costly. Once a particular amount is required, it actually becomes more cost effective to opt for a durable painted solution. Even so, the durable tape can be removed with a little effort, which is great if you need to reconfigure or are moving out of the building.



Epoxy Paint



Painted options remain by far the most popular method of line striping, and of those available, applying paint direct to the concrete surface is preferred every time. It's cheap, can be removed, reconfigured and the most influential reason of all is, it's accepted by landlords. This is an important aspect for many customers and something we have worked with them on to help avoid costs later.

Paint applied directly to the surface is not terrible, but certainly not considered a long-term option by us. It is obvious why when you consider how easy it is to scrape paint off glass or other hard smooth surfaces. It keys (sticks) to concrete well and in low traffic/impact areas, it can be the perfect option.

To make paint durable, you need to prepare the floor surface. Preparation is an important part of any good job, but with floor striping it is critical. Concrete floors in storage facilities are finished to be extremely flat, smooth, and incredibly hard to cope with the weight and turning force of loaded forklift trucks making preparation more difficult.

Preparation techniques range from cleaning to creating recessed channels for paint to sit within. All require specialized equipment operated by experienced teams who know the degrees of blasting, grinding, shaving, or stripping needed.

PREPARATION

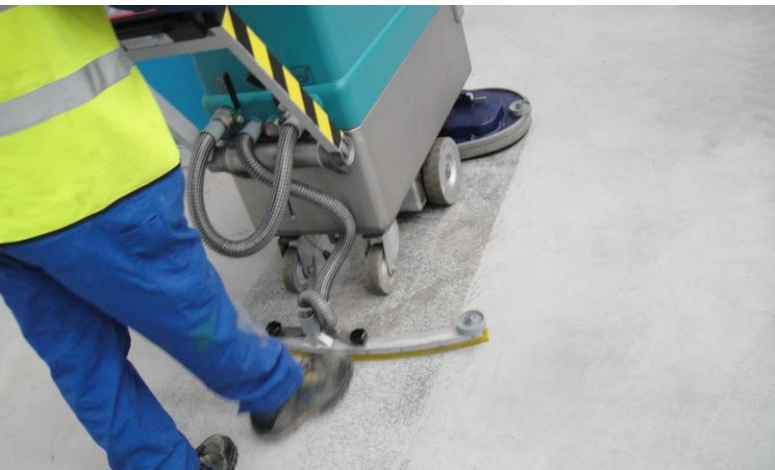


Floor Cleaning

Preparation begins with a clean and tidy area, and regardless of the preparation method, the floor surface condition is critically important. Clearing the area of debris is the first step and if you have chosen a mechanical preparation like blasting with sprayed paint, that should be enough. However, if you are applying paint or adhesive products directly to the concrete surface, you need to scrub the floor thoroughly, so it is very clean and ideally free of any contaminant.

We only recommend using detergents when contaminants like oil or other known substances are present and only in those areas. We do not advise widespread use. Speak with the people who created your floor and/or the producer of the contaminant substance you are trying to remove for the best advice. Concrete slabs are susceptible to moisture ingress and any detergent you add could affect its structure.

We do always recommend water and a scrubber dryer equipped with carbide or other extremely hard bristle heads to remove simple dirt. This gives the best possible surface without adding expense and risking damage. Applying paint or tape directly to the floor is a low-cost exercise, doing deep and detailed cleans will improve the durability and in some cases ability to adhere.



Chemical Strip

Chemical stripping or acid etching has become far less popular in the past 10 years, due to the hazards and control of such materials. Many of which are no longer available. We are not aware of companies using it anymore and do not recommend it as a preparation option but thought it should be mentioned.

Concrete Grinding

Grinding is popular with floor coating and general surface finishing. Carried out properly, grinding can leave an extremely smooth finish and would be best used where floors have high points, are seen by the public, or where there is limited access for preparation machines. Floor coating projects often use this process to improve appearance, though it is a slow process which is not cost effective for large areas.

If you are considering small area markings or coatings, this could be a good option. Fire exit hatching, bay numbering and small anti-slip walkways would be good examples.



Scabbled Prep

Scabbling is a popular method used by external striping contractors. It uses spinning wheels which are fitted with steel or tungsten tips that hit the concrete surface and effectively break the surface, removing the top layer. It is very effective and used to remove internal and external striping lines. A disadvantage is with the finished appearance and control. Lines are often created less than straight, due to the severe action and not entirely prepared, as the tips are not always in contact with the floor.

This may be an option for those needing to add a small number of lines or in areas where appearance isn't an issue.

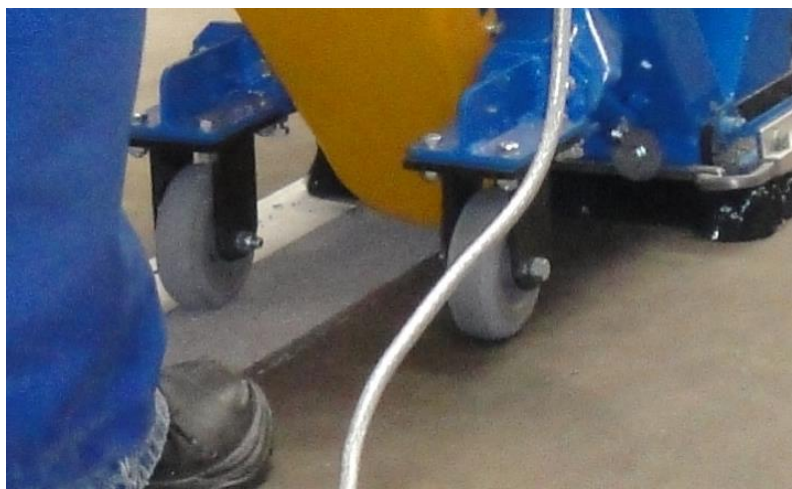


Shot Blasted

Shot blasting is certainly the most popular method of preparation and considered to be an extremely durable solution. There are many machine types and configurations, however the general process is the same with all. The machines are equipped with high power motors which propel metallic beads through the machine and on to the floor through an often-restricted opening for small paths. As they impact the surface, the concrete breaks into small parts and all is sucked back into the machine to be separated and recycled or trashed. From the outside, the machine produces a very defined line without dust and debris.

Specialist companies, such as ASG Services, have more precise equipment, so specific width lines can be created for a superior appearance, however the durability created by all machines and paint is equally as good, it is only appearance that is different.

This would be a great option for companies who have optimized their facility, tested the layout, and have decided to maintain the layout long term. The higher cost of this preparation technique should be considered an investment due to its level of durability and the reduced need to continually maintain the markings.



Embedded Striping

As it sounds, this method of preparation creates a line within the surface level of the floor. A specialized machine, used to remove precise amounts of concrete from tanks, floors and the like, is used in a restricted manner to create a channel. This channel is typically around 1/8 of an inch deep and can be set to almost any line width.

The channel formed presents a clean and open concrete surface which paint systems are able to adhere to across the base and up the sides of the channel, and yet that is not the only thing which helps prevent it being damaged or worn. The line is below or level with the concrete surface, so a forklift truck rolls onto the line, rather than into the side and up onto it which causes impact damage.

This is not indestructible, however if taken care of, will last beyond 6 years without the need for a recoat. Therefore, the initial outlay in price to have it installed is considerably offset by the ongoing maintenance costs of alternative methods.

ASG Services understand that this is often cost prohibitive, therefore we recommend this method in the busiest areas of a facility, which are most likely to wear away or be damaged quickly. This helps to maximize product per budget and minimize maintenance costs later.



Lights and Lasers

The latest developments in warehouse striping have come via light displays. Lasers have been a consideration for many years, however technology needed has always been cost prohibitive for storage facilities, particularly as many units are required for the number of lines in a distribution center. More recently, several companies have risen and developed the technology with a price more relative to the alternatives and their longer term maintenance cost. Increasingly, lasers are being utilized to send beams to the floor, creating lines and storage area markings.



The concept is great with no material wear and being reconfigurable. However, the cost may still be prohibitive for some in the short-term or it becomes more mainstream. Unfortunately, one unit only creates one line, so volume is key to reducing costs. Another thing to consider is beam block where stacked storage blocks the lasers light beam and prevents the image line from reaching the floor and being visible.

Other new products include a light which is attached to a forklift truck which creates lines and symbols around the truck for people to see in advance of the truck. This is targeted toward safety, however it could be of great help with precise pallet positioning, etc.

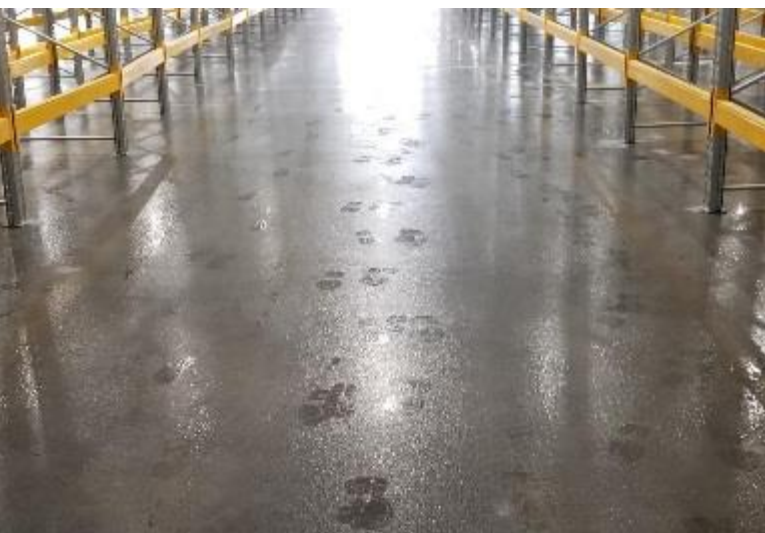
MOISTURE



Moisture Levels

The relative humidity (RH) of a concrete slab/floor is critical to the success of paint adhering to it. Any slab with an RH of 85% or higher will likely result in the paint peeling off the surface as a moisture barrier will form between the concrete and paint.

If your facility is new or you are aware of possible moisture issues with your floor, we strongly recommend that you purchase a reader to establish the levels or ask us at ASG Services and we will provide a price to carry out the tests.



IMPORTANT

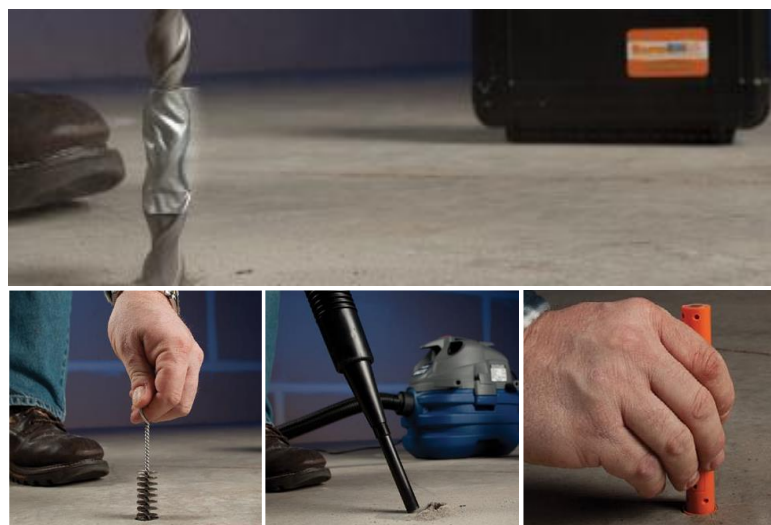
Installation teams cannot begin floor preparations if the floor is obviously damp or suffering from high moisture levels, so it's important to know beforehand so there are no additional costs.

Furthermore, if a paint fail is attributed to moisture levels after an installation is complete, remedial work would be charged for.

Wagner Meters



We recommend the Wagner Meters, the industry recognised devices are freely available and used by experts throughout the USA.



AFTERCARE



Striping Maintenance

Re-painting has been a maintenance task ever since someone thought of marking a floor with paint. Too many lines, too much traffic and only quiet times to carry out maintenance work. The more significant disadvantage of re-painting is that paint comes off the floor because of poor preparation and it did not stick, so new paint added without preparation results in? The same. It comes off!

Some re-painting can be a success though, particularly if the paint is applied following preparation. If the floor is cleaned, and had preparation previously, the new paint stands a much better chance of lasting. Solvent cleaning is best as it helps strip light contaminants from the previous paint.

Cleaning is by far the best way to maintain your lines and prolong their life. Dirt and debris combined with MHE wheels is the worst thing for paint on floors. The mix acts like a sandpaper and wears the paint, and without concrete preparation, the tape or paint simply breaks away from the concrete.



Lift Pallets Clear



Keep Shoes Clean



Keep a Clean Floor



Maintain or Trash Old Pallets

Floor Care Policies

Do you have policies in place for the care of your floor? Here are some you might consider for your facility to help care for your line striping.

Lift Clear

Ensure all MHE drivers and general facility operatives, lift pallets clear off the floor before moving. This prevents scrapes, tears and wearing of the tape, paint and surrounding floor.

Clean Feet

Although small and seemingly innocent, dirt carried in on shoes, particularly when wet outside, adds to the abrasive materials that can wear paint on floors. Entrance mats help reduce the amount of dirt and debris carried in from the outside.

Floor Watch

Instil an awareness in your workforce that encourages the removal of debris and harmful objects when they are spotted. Walking past a screw or stone on the floor can help prevent that small object from creating significant damage to a painted line or tape. These can weaken and leave the line susceptible to rapid deterioration.

Early repair can prevent long-term issues of continuous paint fail.

Pallet Care

Damaged pallets are a major safety risk with pallet collapses in racking, but they also cause significant damage to tape and painted lines. Parts become detached and are dragged around the floor, protruding nails underneath are another culprit of line damage. Removing or repairing damaged pallets will prevent risks and will help protect employees from fatal incidents.

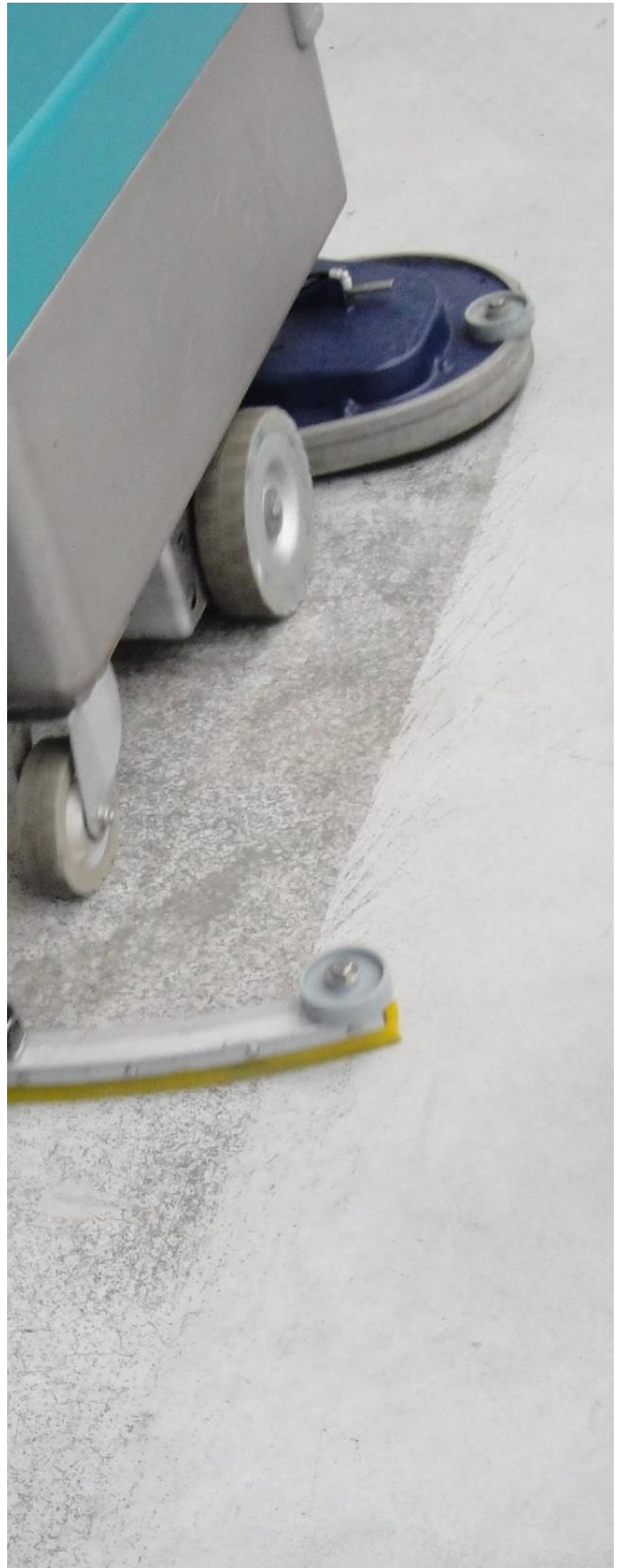
Floor Cleaning

In a busy distribution center, floor cleaning may not seem to be a particularly important activity, since it does not generate revenue. However, it is extremely important in helping to avoid costly repairs later, as well as prolonging your floor stripping.

Scrubber dryer cleaning machines will keep the floor clean without question, using a detergent may even make them so clean, you could eat your dinner off them (not that we recommend it!), however detergents can attack the concrete and seal agents, so it is best not to use one, unless it is approved by the concrete supplier, as they will know the best chemicals to use with the agents in the concrete. Therefore, clean water will be adequate for most of the floor area as it will help collect small dirt and debris.

Select the hardest bristles you can, often made from carbide. These are not strong enough to damage the floor but remove most other things.

There are alternatives to scrubber dryers which use water. Mechanical sweepers can remove a huge amount, and some can even remove larger items. They have advantages as they are cheaper, they do not have batteries as the operative pushes them and they need minimal maintenance. So, you could have several throughout your facility which may help to encourage their use.



Summary

Internal line striping helps with the organization of work spaces and improves safety through route and passageway markings. The choice of layout and design is based on the need of a facility, which could be manufacturing, storage and retail. The layouts can be complex, and in commercial use, can be critical to a company's profitability as they help maximize storage space that is the core asset, as well as improving workflow for cost savings through efficiency.

The product choice to create markings is typically based on budget. However, when working with a solutions provider such as ASG Services, various products, materials and preparation types can be selected based on the required durability, which helps maximize product per cost. Tapes range from low to medium cost, with low to medium durability performance, while paint options range from low to very high costs and respective durability outcomes.

Preparation and maintenance are key to the durability of any floor striping. Without concrete or surface preparation, paint and tape will fail. Concrete preparation options vary and can be expensive, however if the overall cost of a durable striping solution is considered on a commercial investment basis, the savings through reduced maintenance requirement over time are far greater than redoing or recoating lines later. Regardless of preparation, keeping a close eye on and caring for your striping will always help prevent damage by protecting the lines and markings.

ASG Services recommend that you use an internal or external specialist to help with space optimization, then seek the advice of a solutions provider for the best line striping options available to you.

