



the implications of industrial flooring on
modern manufacturing facilities



manufacturing in the northeast

The Northeast has a long history of being home to some of the earliest manufacturing plants. Remnants of suburban mill towns are spread throughout the region, with some central facilities resurrected into modern production facilities churning out state-of-the-art technology.

With the resurgence of new industry and a booming economy, the area has once again been reborn as a mecca of production.

These newer plants are being built with the intent of creating a greener, more sustainable production environment; and flexible factories are emerging as extensions of innovation and tech companies dotting the Northeast corridor.

NE Thriving Industries Include:

- Retail ■
- Mechanical & Automotive ■
- Textiles ■
- Ores & Metals ■
- Food & beverage ■
- Pharmaceutical & Medical Supplies ■

This surge of new manufacturing has paved the way for original construction, as well as renewed interest in the restoration and maintenance of older plants. Commercial flooring systems play an integral role in the design and even the productivity of these factories. Everything from technology to enhanced building materials that promote efficiency and workplace safety are being considered before selecting a flooring solution.

Ideally, a chosen commercial flooring system would have the capacity to suit and span an entire production facility.

This includes several spaces within a factory that have their own set of requirements. Areas within manufacturing complexes include:

- Assembly Areas & Clean Rooms ■
- Material & Inventory Storage ■
- Mechanical & Control Rooms ■
- Restrooms, Changing Spaces, Showers ■
- Maintenance & Repair Centers ■
- Lobbies & Office Space ■
- Break Rooms & Common Areas ■

The challenge that many manufacturers face when selecting a flooring product (or products) is identifying a solution that optimizes the safety and integrity of the space for a longer period of time. Because manufacturers typically require a recoat of flooring every 10-15 years, assessing the space and environmental impact is crucial prior to making a decision. The downtime equated with restoration or replacement of flooring results in loss of revenue. Engineering a more reliable solution minimizes premature repair and maintains profitability.

flexible factories

the evolution of manufacturing

Flexible factories are taking the industry by storm. In addition to integrating technology to adapt to the speed of innovation, flexible factories are changing the flow of workspaces to accommodate more business initiatives and multiple product designs.

This revolutionary push towards inviting and adaptable workspaces has as much to do with productivity as it does safety. And, manufacturers are quickly learning that this new design is also having a positive impact on their bottom line. Continual improvement and the ability to deliver prototypes faster allows companies to generate new products at a rapid pace.

Flexible factories and similar production plants are giving innovation companies the opportunity to both multitask in a single environment and modernize technology with interchangeable machinery. Not only is this a better use of space, but often incorporates energy efficient building techniques that are viable and sustainable.

One of the ways flexible factories are enhancing their workspace is with cost-effective industrial flooring. Polished concrete, for example, has become a popular choice for shop and production floors, and are easily adaptable to communal areas as well. They accommodate many interchangeable systems found in flexible factories and are aesthetically appealing in large open spaces.

lean & 5s standards

Many of today's industries are focusing more on their environment to increase productivity and safety by employing such strategies as LEAN manufacturing standards. The push towards a more streamlined and scaled down approach to factory floors has made an impact on production facilities. Some methodologies, including 5s (sort, set, shine, standardize, and sustain) manufacturing for example, employ a regimented system of ideas to help avoid workplace hazards and clean up manufacturing spaces. It aims to streamline assembly and equipment bays, and accelerate workflows through the standardization of symbols, colors, and labeled areas that better mobilize production floors.

Many companies have looked towards the recoating or resurfacing of industrial floors to help map out these standards and OSHA related guidelines and that support these initiatives. Commercial flooring systems have the capability to be customized and designed to make a space more functional and safe for workers. You can tailor a floor to indicate walkways and pedestrian paths, or use specific colors to point out dangerous, at-risk areas. This minimizes the need for temporary solutions and enhances the look and feel of a safe, productive factory floor.

green manufacturing

The push for greener building has made its way into manufacturing and production. More factories and industrial plants are being designed with sustainability in mind. By using durable, biodegradable and energy efficient materials, construction of these facilities has become an eco-friendly undertaking.

Industrial flooring is one of the first considerations in green construction. Engineering a solution that uses low VOC technology and reduces environmental impact for manufacturing spaces can bolster this initiative. Concrete has emerged as a popular option for a greener production plant – in part for its durability and for being easily recycled. Builders are able to conserve materials and minimize waste, while installing a stronger, long lasting product. Concrete will absorb and retain heat to keep a space warmer, and, in direct sunlight, polished concrete will protect the floors from escalating temperatures keeping a space cool. Industrial flooring can be an energy and cost efficient way to maintain heating and air conditioning.



safety & regulatory implications

Manufacturers and plant managers are cognizant of the safety regulations set forth by local and federal authorities. For example, OSHA inspections are commonplace and violations could result in costly repercussions. From loading docks, assembly areas, break rooms and lobbies, plant managers are diligent about selecting materials that could decrease workplace hazards.

When the safety and integrity of your business is on the line, you address any concerns immediately and resolve problems before they get out of hand. Questionable flooring could lead to substantial problems for owners and managers. The dangers lurking in deteriorating floors can range from a minor tripping hazard to environmental contamination with wide-spread consequences.

Commercial flooring plays a significant role in workplace safety. The floor system you select should reduce OSHA violations and help to minimize the number of work-related incidents on your property.

**35k federal
43k state**
inspections took
place in 2015*

**337+ million
accidents**
happen on the job
each year**

**OSHA's Top 10
Citations**
in 2015 included
*fall protection**



references:

*Occupational Health & Safety Administration (OSHA) - www.osha.gov/oshstats/index.html

**International Labour Organization (ILO) - www.ilo.org/global/statistics-and-databases/lang--en/index.htm

when to repair industrial floors

CRACKING OR CHIPPED FLOORS

Signs of cracked or pieces of a floor that are starting to chip away often indicate a much more serious problem. The reliability of a commercial flooring system becomes questionable when the floor begins to break down – thus, indicating safety concerns. A lack of thermal resistance can lead to cracking and compromise seamless system which can lead to contamination. Any gaps and fissions in the substrate invite bacteria and mold. Cracks are prone to moisture and chemical absorption that infiltrates a foundation can threaten the environment. Patching and repair may be a short-term solution but ultimately the floor will need to be replaced.

BUCKLING & UNEVEN FLOORS

An uneven floor can translate into dangerous terrain for employees and equipment. Buckling or cupping can result from significant temperature changes and the stress of heavy machinery and equipment tread that run regularly across a floor can also cause irregularities. To avoid trips and falling hazards, and to eliminate the risk of production runoff liquids penetrating beneath the surface, buckling floors should be repaired.

STAINING

Discoloration of a floor isn't just unsightly, it can be a sign of a toxic environment for workers. Floors in manufacturing plants and cafeterias are treated with harsh chemicals that sanitize and clean the space regularly. Residual staining can indicate that the topcoat has been compromised and organic resistance is low. Chemicals and acidic byproducts that permeate a commercial flooring system may leave stains behind. This is a telltale sign that the floor can no longer withstand the environmental impact of the space and needs replacement.



common stressors on industrial flooring



HEAVY MACHINERY

Production equipment, from the assembly line to the distribution area, produces vibration and tremors in constant motion. Between the weight of the equipment and the movement of machinery, the flooring underneath can form hairline cracks and fissures in an otherwise seamless surface. These tiny imperfections are the gateway to unsafe flooring and code violations.

Abrasion damage also occurs when the surface of concrete is unable to resist wear caused by rubbing and friction. As the outer paste of concrete wears, the fine and coarse aggregate are exposed, and abrasion and impact will cause additional degradation.

Floor movement can also increase the likelihood of static charges that can malfunction equipment and shock workers. Industrial flooring should be engineered to withstand the continuous motion and treated to resist static electricity.

TIRE TREAD & FORK-LIFTS

While stagnant machines are common in factories, the plants are also subject to mobile equipment and heavy machinery driven around many of the different areas. One of the most damaging forms of abrasion occurs on vehicular traffic surfaces.

Tire tread from vehicles can severely damage a shop floor and cause early decay - requiring recoating and repair. From fork-lifts moving pallets, to the outdoor shipping and receiving autos that track salt, rock, and moisture inside on tires, the production floor is subject to corrosive elements that regularly damage the surface. Chlorides dissolved in water can permeate through sound concrete or reach the steel through cracks. Abrasion of floors can result from production operations and vehicular traffic by steel or hard rubber wheeled machinery, which can cause significant rutting.



MOISTURE & RUNOFF

In manufacturing, a "well-oiled machine" is often a good thing, unless these liquids seep into the floor. Production equipment requires regular maintenance including oils and lubricants to run smoothly and efficiently. These liquids, and other organic matter, can and often do, run-off from production equipment and find their way onto industrial flooring. Selecting a seamless solution that resists volatile organic compounds and avoids bacterial contamination and rapid erosion will help to avoid early decay. Increased slip resistance and tread support should be a consideration to combat wet-spaces or slick substances that seep into the ground. This will also help avoid job related falls and costly injuries.



flooring solutions for manufacturing



URETHANE FLOORS

Ideal for optimum protection in manufacturing and wet spaces, urethane flooring can withstand the stringent conditions including sanitization and decontamination processes, chemical byproducts, and acidic liquids. Urethane is highly durable and thermal shock resistant. A non-porous finish can offer the bacterial and chemical resistance that will maintain both the integrity and sustainability of the floor, to provide a safe and longer-lasting product.



EPOXY FLOORS

Combining high durability with low maintenance, epoxy floors are regarded as a popular option for high-traffic areas in the manufacturing industry. Epoxy however, may be better suited for shipping and receiving areas, packaging, maintenance areas, office spaces, lobbies, break-rooms, and hallways. This commercial flooring product offers little to no thermal shock resistance and limited protection against byproducts and acids. For this reason, it is seldom selected for manufacturing and processing spaces. Engineering additional formula may be necessary to safeguard the floors against corrosive elements in certain manufacturing industries such as pharmaceutical and food and beverage processing.



POLISHED CONCRETE

Give it your best shot. Polished concrete floors are practically indestructible. And, for a production floor under constant duress this may be your first line of defense. While it may be a more-costly solution up front, the thermal shock resistance and virtually no chipping or cracking means it's a reliable choice and will outlast other options-making it more cost-effective in the long run. Polished concrete can also be treated with top sealants for slip resistance and chemical and moisture resistance to protect against mold and bacteria. It is relatively easy to maintain and won't stain easily.

case study



SMC MOLDING MANUFACTURING FACILITY custom flooring and pedestrian walkway design

OVERVIEW

G.C. Bennett Building Corporation, the company hired to renovate the space, reached out to Black Bear Coatings & Concrete with the original intent of recoating an existing floor in SMC Molding's manufacturing facility in Sterling, MA. When Black Bear assessed the current space, it was determined that the existing floor needed to be removed before a more comprehensive solution could be installed. Further discussions with the client revealed a desire to customize the new coating for safety and increased productivity. Black Bear value engineered a new solution that offered SMC Molding a cementitious urethane system with a tailored topcoat to design a walkway for pedestrians on the production floor.

CHALLENGE

The renovation of the 5,800 sqft manufacturing space was completed in phases over 6 days. An accelerated construction schedule meant that each phase needed to be planned out accordingly to limit downtime and not disrupt production of the active facility.

PROCESS

The scope of the project called for the failing VCT system to be removed and the residual material scraped and shot blasted to remove remaining mastic. Dur-a-Flex Polycrrete SLB Shop Floor was installed, and an Armor top coat was poured and set to indicate a grey colored path for foot traffic and direction.

RESULT

The industrial flooring system offers SMC Molding a self-leveling, durable and longer-lasting solution, that contributes to LEED and VOC compliance, and meets ADA, USDA, FDA, CFIA, and OSHA standards.



about the client

Founded in 1988, SMC Ltd. was built on a vision to provide high quality manufacturing services faster than industry options of the day. This core value of speed-to-market is what has grown SMC into a globally recognized supplier to the medical device and pharmaceutical industries. SMC offers complete device services that range from initial design, tooling, component manufacturing, assembly, automation, full supply chain management, and kitting/packaging services for single use and disposable medical devices.

The Northeast's Leading Coatings and Concrete Company

Black Bear Coatings & Concrete is a partner you can trust. Our experts have over 30 years of experience designing, installing, repairing, and maintaining concrete floors.

Our comprehensive approach is all-encompassing. We know that selecting the correct resinous coating to install is defined by the performance of the material in a specific space. Black Bear takes the time to work with clients to understand the environmental conditions of a particular area – including substrate condition, chemical exposure, impact and wear resistance, thermal shock, and aesthetics.

Talk to us to learn more about successful projects in the food and beverage industry to learn how Black Bear Coatings & Concrete can help your company.

the process a customized approach

TESTING

It is critical to understand any underlying issues that may present challenges. Black Bear experts conduct extensive testing of existing concrete surfaces to create the best approach for prep and resurfacing efforts.

COATINGS & OVERLAY

Black Bear can help you select and design the right coating to provide a stronger, longer-lasting concrete surface that really enhances your environment and complements the design.

PREP

Existing concrete needs to be appropriately prepared before any resurfacing with coatings or polymers. Our experts meticulously clean, roughen/profile, and repair any defects to make sure it is ready for resurfacing.

SEALER & MAINTENANCE

Proper protection and maintenance of coating or new concrete extends the life of your product. We work with you to apply the appropriate sealant and to maintain the flooring for years to come.

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