

Industrial Flooring Systems

Every year hundreds of Canadian food and beverage manufacturers undertake the construction of new facilities, or renovate and repair existing plant structures. In all cases, the primary objective is to construct a clean manufacturing environment that allows operation under sanitary conditions, permits cleaning and minimizes the risk of food contamination. A well designed and installed floor system is essential to meeting these primary goals.

Consider for a moment that the floor is the main work platform in any food plant or warehouse and has a significant effect on production and plant efficiency. On a daily basis, a floor must resist everything it comes in contact with including mechanical, chemical and thermal stresses. It must also provide a safe working environment for employees, give a favourable impression to clients, as well as meet all the conditions set out by regulatory agencies.

Two factors are particularly important in the design and construction of high quality, yet economical industrial floor systems: a prioritized list of operational requirements, and a substrate analysis and preparation of a suitable surface.

To select the right floor system, both of these factors must be examined in detail and coordinated. This is the only way to ensure that the industrial flooring meets the requirements of the project and is cost effective.

A typical project has 10 criteria that need to be examined in detail and then prioritized in order of importance. The following is a list of 17 of the most common requirements.

Primary requirements that must be considered on all projects:

1. Expected service life (two, five, 10 or 20 years)
2. Structural requirements to accommodate both static and dynamic loads
3. Colour and appearance: is the floor functional or aesthetic?

Project specific requirements that vary widely:

4. Traffic and mechanical wear: pedestrian, vehicular traffic, low and high lift trucks
5. Chemical resistances: oils, greases, alkalis, acids, solvents, cleaning agents
6. Temperatures: thermal shock, constant heat or cold
7. Slip resistance: wet or dry process areas, smooth or textured finish
8. Hygiene: high standards of cleanliness and decontamination
9. Impact resistance: point loading, pallets, drums, tools and machinery
10. Waterproof: environmental protection, impermeable seal

11. Rapid cure: shut down time frame for installation
12. Green or damp concrete: new concrete requires drying time
13. Neutral odour VOC-free: non-taint, odourless
14. Conductive anti-static: discharge of build-up of static electricity to ground
15. UV resistance: discolouration and degradation of the surface
16. Crack bridging: watertight seal, containment of liquids
17. Cleaning and maintenance: preferred method of cleaning

The substrate is the basis of a floor system whether it is new or old. Thorough inspection and assessment are essential to determine the correct substrate preparation for a successful flooring system. A durable bond must be achieved between the new floor system and the concrete substrate. The following is a list of five common requirements:

1. Compressive strength: >25 Mpa, higher strength may be required to meet defined loads
2. Cohesive strength: >1.5 Mpa, inadequate areas must be removed and replaced
3. Moisture content: <4% by volume for most materials, some exceptions possible
4. Ambient climate: air temperature, substrate temperature and dew point
5. Preparations and cleaning: suitable texture free of dust and contaminates

Once your data is in hand, an educated selection of the best solution becomes apparent. Often this approach will lead you to one or two specific solutions that meet all of your requirements, both during the construction phase and after the floor goes in service. It is important to note that care must be taken to detail your requirements accurately; omissions or inaccurate assumptions lead to a flawed selection process. The result could be construction delays, additional cost, or, in the worst case, complete floor failure.

Remember, the most expensive floor in any facility is the one that needs to be replaced prematurely. Good planning and execution will improve your odds of success.

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