

Flooring Selection for Hospitals and Schools

The majority of floor coverings in hospitals and schools is one of three materials; resilient rubber flooring, vinyl and carpet. The material selection committee must evaluate the advantages and disadvantages of each floor covering. In the article below we will focus on the attributes of these three coverings with respect to:

- Cleaning, ease and effectiveness
- Indoor environmental impact
- Comfort
- Durability

Cleaning

Good cleaning includes the apparent cleanliness, actual cleanliness and ease of cleaning.

Rubber flooring exposes the dirt that is present. No special chemicals are necessary for a clean floor. The floor will permit sanitizers such as full strength bleach to be used with non adverse affects. A broom and mop will clean the floor on a routine basis. A high speed buffer on a clean floor is recommended for best shine. Waxing the floor is not recommended since the wax may discolor the flooring.

Carpet requires noisy vacuum sweepers to remove surface dirt. However, it does not clean down to where the majority of the dirt and filth reside. Also, the exhaust from the vacuum sweeper recycles the smallest particles back into the air. To deep clean carpet, special units using hot water are used. But these units still leave a residue in the carpet scrim. Carpet is a dirt trap and dirt sink.

Vinyl flooring also shows all the dirt that is present. Standard cleaning is similar to treatment of rubber flooring except for waxing. Normally vinyl floors require floor wax from 1 to 12 times per year. Vinyl flooring is inherently unstable dimensionally. Shrinkage causes open seams where dirt and bacteria may collect. Even floors with “welded” seams have this problem since the “weld” normally fails up to 10% per year.

Conclusion: Rubber flooring is the simplest to clean and maintain. Carpet is the most difficult to clean and is not truly clean.

Indoor Environment

Indoor environmental impact includes the installation phase plus the daily use of the building.

Rubber flooring is installed with either a latex adhesive (water based) or epoxy adhesive (100% solid reactive). The rubber has a mild non-offensive odor that dissipates quickly once the HVAC (heating, ventilation, air conditioning) is turned on. This odor is caused by the emulsifiers (soaps) used in the manufacture of the rubber bales. Musson sheet

rubber has no added antioxidant. The latex adhesive is not related to latex found in medical gloves. After the adhesive is set, the rubber flooring will be stripped with floor stripper and neutralized according to the label or with bleach. During daily use, no further stripping or waxing is necessary. Since no further treatment is necessary, there is no additional impact on indoor air quality due to the flooring. Since the flooring traps no residue, no release of pollutants is present.

Carpet is installed with adhesive also. The scrim of the carpet is coated with latex that is processed at lower temperatures and times than rubber flooring. Often carpet has a distinct formaldehyde odor. This odor also tends to dissipate once the HVAC is turned on. However, due to the configuration of the carpet fibers, scrim and latex back coating the carpet acts as a trap for pollutants. The carpet then re-releases the pollutants as the air is exchanged, actually prolonging the exposure time. During daily use, the carpet traps dirt and filth in the body of the carpet. Below is an excerpt from the EPA study **Indoor Air Quality and Student Performance** [EPA 402-F-00-009, February 2003 Revised].

Studies of adults in office settings generally support these associations. In a controlled study of 30 female adults working in an office environment, a 20-year old used carpet, which served as a pollution source, was periodically introduced on racks behind a screen so that subjects had no way of knowing when the carpet was present.³⁰ The subjects were tested in typing, arithmetic, logical reasoning, memory, and creative thinking during several trials with and without the carpet present. These tasks are similar to the kinds teachers and students perform in school. During the trials without the carpet, the subjects' performance improved in all tasks by 2 – 6 percent. When the carpet was present, the prevalence of headaches during tasks requiring concentration increased, suggesting that at least part of the effect on performance was from pollution-related adverse health effects. In a later study using the same procedure, increasing ventilation rates with the carpet present resulted in statistically significant improvements in performance.³¹

To clean the carpets, hot water and various chemicals are added to the carpet. Most, but not all of the water is removed. The remaining water retains a proportional amount of cleaning chemicals and may promote mold growth.

Vinyl flooring is also installed with various adhesives. The vinyl also has a characteristic odor caused by one or more of the following: plasticizers, antioxidants, VCM, etc. During subsequent use, the routine stripping and rewaxing contributes to indoor pollution.

Conclusion: Rubber flooring is the most friendly to indoor air quality. Vinyl flooring is more polluting due to the stripping and waxing. Carpet is the most polluting due to the releasing of trapped pollutants and harboring of dirt and filth.

Comfort

Comfort includes the comfort of the people walking or standing on the floor plus the impact of the movement of items across the floor.

Rubber flooring cushions the foot and allows for easy pushing of carts. Rubber has moderate sound absorption.

Carpet cushions the foot but makes it very difficult to push carts. Carpet has good noise sound absorption.

Vinyl flooring is hard to stand on for extended periods of time. If the vinyl is cushioned, then it is difficult to push carts. Vinyl absorbs sound poorly.

Conclusion: Rubber flooring gives comfort to the foot without making it more difficult to push carts. Rubber flooring is in the middle in noise abatement.

Durability

Durability is a measure of the useful life of the product. Areas discussed will be the life span of each product including wear layer versus solid construction and appearance towards the end of the life of the product.

Rubber flooring has been known to last for 70 years maintaining its original beauty. Musson rubber flooring is solid, maintaining the original color even in high traffic areas.

Carpet has a low durability, needing replacement every 5 to 10 years on average. The carpet traps abrasive materials such as sand which cut the carpet fibers. When carpet wears down, the scrim is exposed creating a shabby appearance. Loop pile carpet can “run” creating a safety hazard and reducing the useful life.

Vinyl flooring normally has a touch wear layer. Once the wear layer is compromised, the remaining material wears very quickly and looks worn.

Conclusion: Rubber flooring gives the longest life maintaining its beauty for decades through several life cycles of other products.

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