



The Use of Zinc in Floor Finish

Floor Care Tech Talk

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Much discussion has been had over the use of zinc in floor finishes and the impact this may have on the quality of the floor finish product as well as the environment. Below is a discussion of zinc and its use (or absence) in floor products and what this may mean to your facility.

What is zinc?

Zinc (symbol Zn, atomic number 30) is the 24th most common element in the earth's crust. Zinc is an essential mineral in biology, for human, animal, and plant life as well as a common and useful element in every day products; sunscreens, diaper rash creams, deodorants, shampoos, dietary supplements, etc. The metal itself is used to create alloys such as brass (copper and zinc) and to protect other metals (galvanized steel is steel coated with a protective layer of zinc). In fact, as of 1982 all US pennies are made from copper coated zinc.

Zinc in floor finish:

Early floor care products were natural products such as carnauba wax, beeswax, shellac, and paraffin. Due to this early use of natural waxes, many floor products are still generically referred to as "wax".

Polystyrene-based synthetic floor coatings were introduced in the 1940s. These early floor finishes were hard and glossy but tended to powder, yellow over time, and have issues with detergent resistance and repairability.

Metal cross linked (metal interlock) floor coatings were introduced in the 1960s. Metal cross linking is a way to bond polymer chains to each other. This allows floor products to have better durability, increased soil and detergent resistance, and to provide a mechanism for easy removal of the product when desired. The primary metal in use as a cross linking agent is zinc. Rather than elemental zinc, most commonly, zinc is present as a Zinc Ammonium Carbonate complex. As water evaporates from the freshly applied floor finish, polymer

and zinc ammonium carbonate molecules come in contact, form bonds, and a small amount of ammonia is given off. This is where the typical ammonia smell of floor finishes comes from.

Zinc free floor finishes:

Environmental concerns over zinc production (waste materials as well as CO₂ and SO₂ emissions) and potential accumulation in water/soil has led to regulation of zinc discharges in many locations. Zinc is also rather difficult material to remove during waste water treatment, and as such, has begun to be regulated in waste water discharge limits. As the demand for reduced zinc usage increased, products without metal cross linking agents began to be developed and sold.

Historically these products have suffered from one of two tradeoffs.

Performance: without a cross linking mechanism some products suffered poor performance and durability. Bonds between polymers in this category (non-cross linked) of products are weak and wear properties are poor.

Removability/repairability: products that were able to cross link without a metal, had no "weak link" to make them removable, and were extremely difficult to remove from the floor when required. Bonds between polymers in this category (self cross linking) are strong and not easily breakable when required.

What about Scotchgard™ Resilient Floor Protector?

Scotchgard™ Resilient Floor Protector is now zinc free.

3M has developed a product with alternate cross linking technologies, using a proprietary (and patented) additive to create a product that is durable, repairable, and removable. This allows customers to use a zinc free product while maintaining superior durability AND reparability; rather than having to choose between them.

Additionally, Scotchgard™ Resilient Floor Protector builds initial hardness 40% faster, has superior gloss retention, superior soil resistance, and superior hand sanitizer resistance when compared to leading competing traditional acrylic floor finishes.

Scotchgard™ Resilient Floor Protector has been certified by the National Floor Safety Institute as providing “high traction.” A wet static coefficient of friction (SCOF) of greater than 0.60 was chosen by NFSI as the criteria for “high traction” because, according to NFSI, floor surfaces maintaining this level of slip resistance when wet have proven to reduce slip-and-fall claims by between 50% and 90%.



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