

Fast-set spray systems typically fall into one of three categories: Polyurethane, Polyurea and Hybrid. Each chemistry has its advantages and disadvantages based on the application. Let's understand the basics of each:

Polyurethane – A polyurethane is formed from the reaction of an isocyanate and a polyol. Polyurethane coatings are considered the economy option. While polyurethane formulations allow for a wide range of hardnesses and physical properties, they are very sensitive to a reaction between the isocyanate and water (typically in the form of humidity or substrate surface moisture). These chemicals react very slowly unless a catalyst is added. The catalyst promotes the undesired reaction between the isocyanate and water, as well as the desired reaction between the isocyanate and polyol. For this reason, polyurethane coatings are very sensitive to humidity and moisture that can adversely affect the performance of the coating. We find that all types of polyurethane coatings work well in general industrial metal, heavy equipment and plastic primer, topcoat and clear-coat applications.

Polyurea – A polyurea is formed from the reaction between an isocyanate and an amine. Polyurea coatings are considered the premium coating option. Polyureas are more expensive than polyurethanes, but allow for significant processing and application advantages. These chemicals react almost instantaneously, even without a catalyst. Since there is no catalyst in the formulation, the isocyanate-water reaction is very slow. The isocyanate-amine reaction is so fast that the reaction between isocyanate and water is eliminated. This allows polyurea formulations to be very robust to any humidity or moisture concerns that would otherwise have a negative effect on the performance of the coating. Polyurea coatings are preferred as topcoats for applications where very rapid curing is needed for fast turn-around times, and when the coated substrate will be exposed to extreme conditions and appearance is not a key concern.

Hybrid – Hybrid coatings are a blend of polyurethanes and polyureas. The reaction is between an isocyanate and a blend of polyols and amines. The amine content allows for a lower level of moisture sensitivity, and the polyol content allows for a more favorable price point. Hybrids are an excellent choice for the widest range of applications, as they provide an excellent balance of performance, moisture insensitivity, and price. The most common OEM uses are corrosion control and waterproofing applications.



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