

LUMIFLON® Technical Bulletin

Life Cycle Cost Analysis: LUMIFLON vs. Conventional Coatings



LUMIFLON is a fluoropolymer resin composed of alternating fluoroethylene and vinyl ether segments (FEVE). Polymers with this unique chemical structure produce coating formulations with excellent durability, weatherability, and chemical resistance.

The Cost of Coating Systems

Coating systems are priced in \$/gallon in the U. S. Coating cost per gallon or coating cost per surface area is not the best way to measure the value of a coating system. Rather, applied cost, which takes into account not only coating costs but application costs, labor, and stating costs, is a more accurate measure. Because coating systems vary in their lifetimes, applied cost per year should be used to denote the true cost of a coating system.

LUMIFLON based coatings are more expensive in conventional pricing measures than most other coatings due to the higher cost of the resins. The data in Table 1 below illustrate the higher cost. Table 1 shows the cost of the topcoats only. The polyurethane is about three times the cost of the alkyd topcoat. However, the LUMIFLON coating is eight times the cost of the alkyd topcoat, and almost four times the cost of the polyurethane. Based on this information, it would appear that the fluorourethane is a poor choice for a cost effective coating system.

Table 1

Coating Cost: Alkyd, Polyurethane, and Fluorourethane

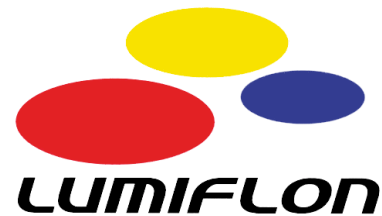
Topcoat Type (Thickness)	Alkyd (50 µm)	Polyurethane (55 µm)	Fluorourethane (55 µm)
Coating Cost, \$/m ²	\$1.47	\$4.08	\$12.01

Life Cycle Costs for Coating Systems

The proper method of developing costs for coating systems is to use life cycle costs; that is, the applied cost of the entire coating system per year of coating life. Data in Table 2

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below shows the comparative life cycle costs for an alkyd, polyurethane, and a fluorinated urethane.

Table 2
Life Cycle Costs: Alkyd, Polyurethane, and Fluorourethane Coating Systems

Coating System	Alkyd	Polyurethane	Fluorourethane	
Total Repainting Cost, \$/m ²	69.48	85.65	93.87	
Estimated Coating Life, Years	7	18	30	60
Total Applied Coating System Cost, \$/m ² /Year	9.93	4.76	3.13	1.56
Cost Index	100	48	32	16

Coating specification from "Coating Handbook for Steel Bridges," Japanese Road Association. Other references include "Civil Engineering Cost Information" July, 2006, "Prices of Construction Materials and Wages" October 2006, and "Heavy Duty Construction Guidebook" March 2007. Repainting cost includes cost of primer, middle coat, and topcoat, labor, surface preparation and staging costs. Total coating thickness used varies based on relevant specifications

Table 2 includes several pieces of information of interest. First, the applied cost range of the coating systems tested is far narrower than the cost of each topcoat. Based on the cost of the alkyd coating system, applied cost for the LUMIFLON based fluorourethane is only about 35% higher. This is because for almost any industrial painting project, labor costs, application costs and staging costs are higher than the coating system cost. Compared to the polyurethane system, the LUMIFLON system is only about 10% higher in cost. Both of these systems used similar primers (zinc rich) and middle coats (epoxy), so the difference in applied cost is due to the higher price of the fluorourethane.

Total applied cost is the applied cost of each coating system divided by the years of expected service. When this measure is used, the urethane coating is shown to be less than half the cost of the alkyd, even though the topcoat costs about three times as much. The life cycle cost of the LUMIFLON based coating system is only 1/3 that of the alkyd, and only 2/3 the cost of the urethane assuming a topcoat life of 30 years. If the fluorourethane topcoat life is assumed to be 60 years, then the relative cost falls again. The data clearly show that the LUMIFLON based coating system is by far the most cost effective when coating life is taken into account.

