

Volume 8 No. 3**Dye Lot Variations**

The use of dyes dates as far back as 30,000 B.C. during the Paleolithic Age when the use of a mix of animal fats and an assortment of native plant pigments, roots, moss, fruits and charcoal to create finger paints that were commonly used to record different events on cave walls. By 1500 A.D. the art of Oriental rug making came into being. Over the many centuries, textile dyeing became commonplace in almost every culture and society. Starting with natural materials wool, sisal, silk, hemp and cotton that were woven, knitted and flocked, textile dyeing progressed to rayon, acrylic, nylon, polyester and polypropylene synthetic fibers that are tufted and fusion bonded. Initially, dyeing standardization procedures were lacking, and dye fastness properties were poor. However, today we use mixtures of the same natural, as well as an assortment of synthetic acid dyes, azoic dyes, disperse dyes and basic dyes in pre-dye and post-dye procedures to create reproducible, very detailed antique and modern day pattern motifs and vibrantly colored carpets made using dyes with outstanding dye fastness properties.

Although today's carpets are constructed using yarn systems and/or dye methods capable of producing several hundred square yards or more of finished carpet from the same dye lot, matching dye lot alone should not be the sole consideration, or considered to be a slam dunk indicator when ordering carpet from the same dye lot that was produced (finished) at different times and/or at different locations. The reason for this is due to the common but small variations in tufting from one tufting machine to another with the same set-up, which often creates subtle differences in shade or color influenced by inconsistent diffusion of light created in the finished texture of two or more carpets that were manufactured separately.

Another consideration when ordering carpet from the same dye lot is the coater dates and locations. Because the high temperature heat used during the coating process can have some influence on the texture of a carpet, common slight variations of two to three degrees Fahrenheit from one coater location to another, as well as variations in coater operating speeds can also cause two or more carpets from the same dye lot to be incapable of producing perfect side matches at seam locations. Typically, carpet manufacturers will flag and segregate rolls from the same dye lot that will not likely match for these reasons.

When ordering carpet outside the same dye lot in effort to obtain a side match or especially to match additional carpet with already installed carpet that has already been characteristically altered in appearance by usage, it is essential to take into consideration the normal dye lot variations that are typically encountered when ordering carpet from different dye lots. Although conventional wisdom suggests that carpet made from solution dyed yarn systems will not likely be problematic in this regard, when one considers the other aforementioned factors, hoping to obtain near perfect side match scenarios when installing any carpet produced from varying dye lots is tenuous at best. In these instances, conventional wisdom is more like a grainy black and white photograph-it's never clear and should not carry the vote over practical sense when figuring floor plans and seam locations where the carpet being used is intended to side match at seam locations. Otherwise, the end-user will liken the pleasing aesthetics of their new carpet to a stained dress shirt.

The science of mixing, matching and maintaining precise dyestuff formulas and dye pigment make-ups is not 100 percent exacting science. The makers of Oriental rugs had, for centuries, denoted the subtle differences common to dye lot variations in their products. Even today, due to the complex nature of dyeing textiles, including the common variables associated with mixing carpet dyes and auxiliary chemicals, even the slightest variation will influence the shade of the finished carpet. However, these variations are kept within a stringent but practical tolerance that our industry has relied on for decades for quality control purposes.

In almost all cases, shade variations from one dye lot to another is typically not greater than 10% plus/minus from the manufacturer's standard. However, even here one must consider that one given production can be within 10% heavier in shade than the manufacturer's standard, and another production run of that same style/color carpet be within 10% lighter in shade than the manufacturer's standard and both still be well within the acceptable range of dye lot variation, even if the actual difference in shade between the two productions could be as great as near 20%! This is why it is imperative to know that (dye lot) shade variations are not validated base on comparisons to the dealer's showroom sample or from roll to roll, but rather from roll to the manufacturer's standard. One must consider too that although most manufacturers are vertically oriented and thus produce much of their own fiber, common, and often unexpected changes in fiber producer sources can also cause one carpet production to vary in shade from the manufacturer's standard.

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