Theoretical Yield vs. Actual Yield, and Factors Affecting Actual Yield

In most cases, yields for polyurethane foam systems are published as "theoretical", for comparison purposes and for cost quoting purposes. "Actual" product yields will always be somewhat less than theoretical, due to a variety of application factors such as ambient temperature and humidity, application technique, etc. This is true regardless of manufacturer. Fomo Products also will clearly describe published yields as either "theoretical" or "actual", so that the end user can compare and purchase accurately. The information below will provide more detailed information regarding this subject, and the factors which may influence actual product yield.

The theoretical yield for all products is shown on the respective Technical Data Sheet. In addition, the product labeling or packaging may also show product yield. Most two-component non-refillable systems from Fomo Products have Model Numbers which reflect the product theoretical yield in board feet. For example, a II-205 kit has a theoretical yield of 205 board feet. Likewise, a II-605 kit has a theoretical yield of 605 board feet. Since there are 12 board feet in one cubic foot, simply divide by 12 to obtain the theoretical yield for each kit in cubic feet (for example, 605 divided by 12 equals 50. Therefore the theoretical yield of a II-605 kit is 50 cubic feet). This theoretical yield is calculated based on the amount of chemical in the kit divided by the final in-place density of the foam, For standard two-component products the final in-place density will be 1.75 pounds per cubic foot (p.c.f.). The actual product yield, however, will be affected by final in-place densities (which may be higher than 1.75 p.c.f., depending on the application) as well as gas loss and product loss during application (due to overspray, amount of blowing agent retention, etc.).

Actual two-component froth foam product yields will typically be 0%-15% lower than published theoretical yields, due to the factors described above.

In regards to one-component products, there may be a significant difference between one-component product yields (actual vs. theoretical) and two-component yields. The reason is based in the inherent differences between the two types of systems. That is, one-component foams are typically dispensed as a bead for filling small cracks and voids, so therefore the yield is typically shown as a linear coverage rate of a specific diameter bead. On the other hand, two-component foam yields are typically shown as cubic feet (cubic meters), square feet (square meters) or board feet (one board foot is defined as one square foot at one inch thickness, or 12"X12"X1". There is no metric equivalent to a board foot, by definition). In addition, one-component foam is moisture-cured, and therefore more subject to differences in ambient conditions. The end result is that there will typically be a much greater percentage difference between theoretical published yields and actual product yield for one-component products as compared to two-component foam.

For this reason, Fomo Products, along with a committee made up of representatives from some of the major one-component foam manufacturers have developed a standardized testing method to more closely determine the actual yield that might be expected from a one-component foam product. This testing method was recently published by The American Society of Testing Standards (ASTM) as test method ASTM C 1536. In the future, this ASTM test method will be more universally used and cited by the major one-component foam manufacturers. In the meantime, it is important that the end user of any one-component product properly compares whether a published yield is based on theoretical calculations or

actual, such as by ASTM C 1536. Fomo Products will clearly state whether yields shown are actual or theoretical;

Actual one-component foam yields will vary greatly from the published theoretical yield, and may be as much as 50% lower, due to the factors described above.