TECHNICAL BULLETIN

SUBFLOOR ASSEMBLY CONSIDERATIONS

When properly selected and installed, construction adhesives applied to wood subfloor systems provide builders with solid flooring solutions. Problems, however, can surface in the form of squeaks, creaking, and other noises when improper installation and inadequate or incompatible materials are combined.

Subfloor related noises can often be attributed to movement of flooring components when walked on; a result of excessive gaps between flooring panels and the supporting joist system. Panels not held tight to supporting joist system components may move and rub against metal (i.e. nails) and/or compress and crush cured adhesive.

These gaps may form for a variety of reasons. Below is a noncomprehensive list of the most common. By understanding these causes, installers can avoid future issues by preventing gaps and subsequent noises, while ensuring the fastener and adhesive combination initiates and maintains a tight, reliable bond between the panel and joist system.

- **Moisture Content.** Wet or "green" materials will eventually dry and as they do, gaps will form. It is recommended that materials reach a moisture content level of <19% prior to installation.
- **Panel Spacing.** Panel expansion may occur during high levels of moisture, causing buckling and subsequent gap formation where panel spacing, as required by panel manufacturers, was not followed.
- **Improper Adhesive Application.** Inconsistent adhesive bead application and or working too far ahead may lead to poor adhesive performance. Follow all manufacturer installation instructions and take note of environmental conditions that may impact working and cure time. Adhesive must also be used within shelf life period. Refer to product technical data sheets for lot code explanation.
- **Excessive Deflection.** Truss and floor system deflection will vary based on design and materials. As such, each adhesive technology will perform differently under various conditions. Installers should consider materials and surfaces, environmental conditions, and performance characteristics required when choosing an adhesive and fastener combination. For instance, Polyurethane technologies typically offer the greatest adhesive strength and are recommended for use in combination with screws on premium weather-resistant subfloor panels and open web truss systems.
- **Joist Variation.** Dimensional height differences between spaced supporting joist system components may cause gaps to form under bridged subfloor panels which become further pronounced after materials have fully acclimated.

The use of construction adhesives may help reduce gap formation and panel movement, thus decreasing the potential for noises, however, they alone cannot overcome many of the challenges noted above. For this reason, Henkel recommends the use of screws. Additionally, Henkel offers several resources, including technical data sheets, for each of its adhesive products. Go to ositough.com and loctiteproducts.com to learn more about Henkel's adhesive portfolio and to determine which product is best for your project.
As an additional reference, APA – The Engineered Wood Association, has published several documents related to this topic, including a Technical Note from 2002 titled Floor Squeaks: Causes, Solutions and Prevention. Henkel recommends all subfloor installers review these documents along with manufacturer recommended installation instructions prior to construction adhesive selection and application.

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