

MATCHING JOINT COMPOUND WITH THE PROPER JOINT TAPE

USG receives many inquiries regarding what kind of joint tape to use with different types of joint compounds. This white paper summarizes testing that USG Research conducted on the attributes of fiberglass mesh tape and paper joint tape when used with ready-mixed drying-type or setting-type joint compounds for interior drywall joint finishing applications.

Drying-Type Compounds: A joint compound that is mixed at the factory and delivered in ready-to-use form. They convert to a hardened material through evaporation of water. These products come in an array of formulations and packaging sizes, including pails or plastic-lined cartons.

Setting-Type Compounds: A powder joint compound that is mixed at the job site. They convert to a hardened material through chemical “setting” reaction, which is available in 20, 45 and 90 minutes. These products are packaged in a variety of bag sizes.

USG tested several joint tape and joint compound systems using modified ASTM C474, *Standard Test Methods for Joint Treatment Materials for Gypsum Board Construction* (Appendix X2) and have arrived at some useful conclusions regarding strength and crack resistance of finishing systems.

USG tested the joint system in four different modes in which the adjacent boards can move relative to each other:

- 1) Expansion, in which the boards move apart;
- 2) Compression, in which the boards move together;
- 3) Shear, in which the boards move parallel to the joint in opposite directions; and
- 4) Bending, in which the joint flexes out of the plane of the wall.

PAPER JOINT TAPE VERSUS FIBERGLASS JOINT TAPE

PAPER JOINT TAPE

There are two types of joint tape that can be used to finish gypsum board, paper and fiberglass, and each have distinct advantages and disadvantages.

USG Sheetrock® Brand Joint Paper Tape is manufactured with a unique, strong, cross-fibered tape for use with USG joint compounds in reinforcing joints and corners in gypsum panels. The wafer-thin tape is lightly sanded for increased bond and lies flat for easy concealment.

If the application requires a tape that demonstrates enhanced crack resistance, it is recommended to use USG Sheetrock® Brand Heavy Joint Tape. USG Sheetrock® Brand Heavy Joint Tape can be used with the same joint treatment recommended for USG Sheetrock® Brand Joint Paper Tape.

Research shows that paper joint tape is ideal with both drying- and setting-type compounds, as it reinforces the joint compound in compression, bending and shear, and will prevent visible cracking.

FIBERGLASS JOINT TAPE

USG Sheetrock® Brand Fiberglass Joint Tape is made with a unique cross-fiber construction to provide greater drywall joint strength than conventional fiberglass leno-weave mesh tapes. This self-adhesive tape goes on quickly, eliminating the bedding coat. Finished joints are accomplished in two coats by using setting-type joint compound. It is not recommended to use drying-type compounds with fiberglass tape.

Fiberglass tape is strong in expansion under ultimate tensile load, but does not reinforce the joint compound in compression, bending and shear and will allow visible cracking of the joint compound to occur at lower loads as the glass mesh stretches.

PAPER JOINT TAPE VERSUS FIBERGLASS JOINT TAPE CONT.

TESTING

USG prepared joints with both paper and fiberglass joint tape, using both setting- and drying-type joint compounds, and found a significant difference between joints made with the two types of compound in all four modes—compression, expansion, shear and bending.

The test results were very clear with drying-type compounds; joints prepared with fiberglass tape and drying-type compound are significantly weaker than those prepared with paper joint tape and drying-type compound in compression, shear and bending modes. When using setting-type compounds, fiberglass joint tape that is either rolled on or wiped on with a knife (to remove all slack between boards) during application gives a marginally stronger joint in the expansion mode, however, paper tape is still far stronger in the compression and shear modes.

CONCLUSION

While fiberglass mesh tape is stronger than paper tape in expansion under ultimate tensile load, it does not reinforce the joint compound in compression, bending or shear, and will allow visible cracking of the joint compound to occur at lower loads as the fiberglass mesh stretches. To minimize the potential for joint cracking, paper joint tape is recommended.

PERFORATED VERSUS NON-PERFORATED PAPER TAPE

PERFORATED

Another common concern is the effect of perforation (spark or mechanical) versus non-perforated and its effect on the performance of paper joint tape.

When USG invented metal joint tape in 1929, which replaced open-weave cloth, it was clear that holes were necessary in the metal to allow water to escape from the drying-type joint compound. Large holes also allowed compound to bridge between the top and bottom sides of the metal tape, to hold the tape in place and to strengthen the joint, since there was little bond between compound and the metal. When USG invented paper joint tape in 1939, the paper joint tape demonstrated a better bond with joint compound, but the paper was not very porous, and small perforations were added to help water escape from behind the tape.

NON-PERFORATED

As paper technology evolved from the 1950's through the 1980's, it was determined the holes were not large enough to form strong bridges between compound above and below the plane of the tape. Additionally, the higher-porosity papers rendered the perforations unnecessary for drying, so they were removed from USG paper joint tape. In recent years, the paper used to manufacture USG Sheetrock® Brand Paper Joint Tape has been engineered specifically for high strength, especially when saturated with wet joint compound, and excellent porosity, which allows water to pass through the tape easily allowing compound to dry beneath the tape.

CONCLUSION

USG has found that there are no significant differences in drying time between joint compound under USG Sheetrock® Brand Paper Joint Tape versus competitive perforated joint tapes.

JOINT TAPES FOR INDUSTRIALIZED CONSTRUCTION

PRODUCT INFORMATION

See usg.com for the most up-to-date product information.

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NOTE

Products described here may not be available in all geographic markets. Consult your USG Company sales office or representative for information.

SAFETY FIRST!

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read Safety Data Sheets and literature before specification and installation.

Because of the nature of assembly-line production, fiberglass joint tapes and setting-type compounds have been developed for Industrialized Construction. When joint paper tape and a drying-type compound are used for joint finishing, the water in the compound temporarily weakens the tape, creating a joint that only achieves strength after drying fully. In addition, the application of a paper tape joint finishing system requires a higher skill level and is more time-consuming than application of a system using mesh tape.

For these reasons, it is recommended that fiberglass joint tape and setting-type compound be used for finishing flats in industrialized construction. This joint tape is self-adhesive, which will also simplify and speed the finishing process.

For areas such as corners and wall/ceiling intersections, the use of paper joint tape is still recommended. Paper joint tape is supplied with a center crease to facilitate placement in interior angles.

SUMMARY

Paper joint tape is the best choice for strong, crack-resistant joints with all compounds. However, if a fiberglass joint tape is chosen, a setting-type compound must be used.

800.USG.4YOU
800 (874-4968)
usg.com

Manufactured by
United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

J2140/1-16
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