DRY WALL JOINT AND FINISHING COMPOUNDS

BACKGROUND OF THE INVENTION

This invention relates to dry wall joint compounds used to prepare dry wall joint cements and dry wall finishes.

When gypsum dry wall board or the like is used as a wall surfacing in construction projects, adhesive or cementitous fillers are usually used in combination with a tape material to close and fill the joints and corners between adjoining panels of the dry wall. Some of these fillers, and others with slightly modified formulations, are also used as finishes on dry wall surfaces.

In one widely used technique for filling dry wall joints, water is added to a gypsum joint filler compound to form a mud-like material which is applied with a trowel or the like to close the joint. A fiberglass, cloth or paper taping material is then stretched over the joint and embedded in the soft "mud". A overlayer or top dressing of the "mud" is applied over the taping material to completely fill the joint and provide a smooth surface. After setting, the top dressing usually must be sanded to smooth out irregularities prior to painting or applying a wall covering.

In addition to the multiple and time-consuming steps required for applying the tape and filler, many conventional wall board joint compounds have one or more of the following shortcomings: cannot be applied at subfreezing temperatures, requires up to 24–48 hours to completely harden, shrinks to some degree upon drying, requires an additional top dressing to completely fill the joint unless some excess is applied, and is vulnerable to cracking, particularly when used on prefabricated or panelized modular wall or ceiling structures transported from an assembly plant to construction sites.

SUMMARY OF THE INVENTION

A principal object of the invention is to provide a wall board joint compound which can be used as a joint cement or wall finish for dry walls and which is resistant to cracking and shrinkage.

A further object of the invention is to provide a wall board joint cement which can be used, without a taping material, to completely fill the joint between adjoining panels in a one-step operation.

A further object of the invention is to provide a liquid additive composition which can be conveniently admixed with various wall board joint compounds to produce a cement having the capabilities described in the preceding paragraphs.

Other objects, aspects and advantages of the invention will become apparent to those skilled in the art upon reviewing the following detailed description and appended claims.

The wall board joint compound provided in accordance with one aspect of the invention comprises a powdered mixture of gypsum, hydrated gypsum, calcium carbonate, plaster of paris, hydrated amorphous silica, and talc. This wall board joint compound can be admixed with appropriate amounts of water and used as finish for dry walls or as a joint cement.

The liquid additive composition provided in accordance with another aspect of the invention comprises an aqueous mixture of zinc oxide, sodium acetate, ammonium alum, an acrylic resin and water. This liquid additive composition preferably is admixed with the above wall board joint compound to form a joint cement, but also can be mixed with a gypsum-based dry wall joint filler to provide a joint cement having the capability of completely filling wall board joints in a one-step operation without a taping material.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The wall board joint compound of the invention comprises a powdered mixture of gypsum, a hydrated gypsum, calcium carbonate, plaster of paris, hydrated amorphous silica, and talc.

The wall board joint compound can be mixed with appropriate amounts of water to provide a creamy or mud-like, spreadable material which can be applied to dry wall surfaces (as is or with the addition of an aggregate) in a conventional manner to provide a finish of desired texture to the otherwise smooth wall surface. This material can also be used as a joint cement as is or in conjunction with a conventional tape material. Accordingly, the term "wall board joint compound" as used herein (including the claims) encompasses a compound suitable for use as a joint cement and dry wall finish and the term "joint cement" encompasses a mixture of the joint compound and a liquid which is suitable for use as a joint cement and a finish for wall board and the like.

The wall board joint compound preferably contains about 27 to about 41 weight % gypsum, about 24 to about 38 weight % hydrated gypsum, about 16 to about 26 weight % calcium carbonate, about 5 to about 9 weight % plaster of paris, about 4 to about 6 weight % hydrated amorphous silica, and about 1 to about 3 weight % talc, all based on the total weight of the powdered mixture.

A wall board joint compound particularly adaptable for use in the preparation of a joint cement contains about 34 weight % gypsum, about 31 weight % hydrated gypsum, about 21 weight % calcium carbonate, about 7 weight % plaster of paris, about 5 weight % hydrated amorphous silica, and about 2 weight % talc.

The liquid additive composition of the invention comprises an aqueous mixture containing about 0.35 to about 8 weight % zinc oxide, about 0.35 to about 1.5 weight % sodium acetate, about 0.35 to about 3 weight % ammonium alum and about 0.35 to about 8 weight % of an acrylic resin, all based on the total weight of the aqueous mixture. The mixture usually contains about 80 to about 98 weight % water.

The zinc oxide, sodium acetate and ammonium alum preferably are used in the powdered form. For best results, these ingredients should be finely-divided, preferably in the order of about 300–320 screen mesh.

Various commercially available acrylic resins commonly used in latex paint formulations, such as Acryloid coating resin (acrylic ester polymers) solutions supplied by Rohm & Haas and UCAR 366 supplied by Union Carbide (an acrylic resin synthetic latex emulsion), can be employed in the liquid additive composition. These resins typically are supplied as an emulsion or dispersion containing about 30–40% solids. When such an emulsion or dispersion is used, the zinc oxide, sodium acetate and ammonium alum can be mixed therewith first and the resulting mixture added to and thoroughly mixed with sufficient water to make 100 parts by weight of the composition.