Joint Systems Recommendation - Basecoat compounds comparison

A number of ready mixed compounds can be used as a basecoat, i.e. the first and second coats in a typical three coat plasterboard joint system. However, setting compounds are more commonly used for the first and second coat application. There are good reasons setting compounds are often a better solution for the first and second coat application in New Zealand conditions.

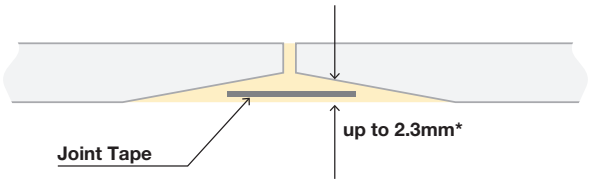
Compound hardening/curing mechanism

Ready mixed compounds cure and harden when they dry and can be referred to as air drying compounds. In contrast, the dry powder setting compounds cure with a chemical reaction that turns plaster into gypsum (when water is added and after the working time has lapsed), and this process is referred to as setting.

> **Setting compounds harden/cure even in poor drying conditions. Ready mixed compounds rely on good drying conditions to harden/cure.**

Coat thickness

The first and second coats are typically applied relatively thick and a jointing tape is embedded in the first coat to strengthen the joint. This makes it difficult/slow for moisture to evaporate from these coats and will take longer to dry.



*AS/NZS 2588:1998 page 6

ABOVE: Board taper with depth measurement

Use setting compounds for large voids

"Any voids exceeding 4mm in depth or gaps exceeding 3mm between boards shall be filled with setting tape cement and allowed to set prior to proceeding with jointing." AS/NZS2589:2007 page 44.

Time required to cure/harden

Air drying compounds can take a long time to cure in typical New Zealand drying conditions when applied thick and bedding in a jointing tape. This can take

more than two days; see the GIB® Site Guide (Dec'14, p. 80) for a table with approximate drying times at various temperatures and relative humidity.
Setting compounds chemically cure after the working time has lapsed and regardless of drying conditions. Setting compounds normally also create a stronger joint in comparison to air drying compounds.

Shrinkage

Plasterboard jointing compounds shrink as they cure. The thicker the compound is applied the larger the shrinkage. Air drying compounds generally shrink more than setting compounds. Shrinkage for air drying compounds is higher because it continues to cure and shrink till it is completely dry. In setting compounds most of the shrinkage is completed within two hours after the working time has lapsed, i.e. after the crystalline structure has formed.
Minor shrinkage will continue till the compound is completely dry. There should be no more shrinkage before the next coat is applied. Various problems are likely to manifest if shrinkage occurs to a basecoat that has already been covered.

ABOVE: Paper tape pulled out of joint to check adhesion.

Tape adhesion

Setting compounds provide much better tape adhesion than air drying compounds. Jointing tapes provide critical reinforcing strength to plasterboard joints. Adequate joint strength is particularly important in GIB® Bracing Systems as well as for general durability.

Ambient temperature

Air drying compounds should not be used below a certain temperature (when applied and while drying), typically 10°C is the minimum. The binder/glue in air drying compounds will not coalesce/harden below this minimum temperature and result in a weak joint (i.e. risk cracking especially when used as a basecoat). Setting compounds perform better in cooler temperature. They form a crystalline structure and do not rely on a binder for their strength. If ready mixed compounds are used in cooler temperatures it is recommended to heat the structure uniformly (to around 18°C) and especially when used as basecoats.

SUMMARY

Some air drying compounds can be used as basecoats. They need to be left to dry for the appropriate length of time and not used in cool temperatures. In New Zealand the drying time is typically too long for stoppers (e.g. due to low temperature and/or high humidity). Hence, stoppers normally use setting compounds as their basecoats to create a reliable strong basecoat and joint. Setting compounds allow subsequent coats of compound to be applied more readily in common New Zealand weather conditions. Setting compounds form a stronger joint and are cost effective.
Ready mixed compound should only be used as a basecoat with above mentioned caution in mind.