



# Compound Supplement Document

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GIB®

## Why do drying times for compounds differ?



As we head into cooler weather, stoppers will find that compounds can take a lot longer to dry than in summer.

### Drying rates are dictated by several things:

- The mass of compound to be dried (thick layers take longer).
- The temperature on the day.
- The set time of the compound.
- The movement of air.
- The humidity in the air.
- The amount of water added to the compound.

The drying rates shown on GIB® packaging are achieved in conditions of around 20°C, and 70% humidity (a warm day with an average humidity level).

Cold air and high humidity slow drying rates significantly. Drying can become significantly longer in winter, and time should be allowed for this.

Allowing air flow through the structure during cooler weather will replace the air which has become high in humidity due to water transfer from wet joints.

The air flowing in will have a lower humidity enabling drying to continue overnight. This can be achieved by leaving a window open about 50mm at each end

of the house. This is enough to enable an air flow of appropriate volume to lower humidity thereby continuing the drying process. This does not work in fog or tropical cyclones.

Heating the structure, which raises the temperature and lowers relative humidity, could also be employed. For normal houses use 2kW fan heaters at the rate of one per 50m<sup>2</sup> of floor area. Leave internal doors open and two windows open to allow fresh air in. Run at night time. This will elevate the temperature of the room just enough to assist drying and will move the air around, which also aides drying. Make sure you check with the main contractor before doing this and remove all flammable items that could be sucked into the fan heater and cause a fire.

Dehumidifiers do work in winter, provided the house is closed to the outside. Close all windows and doors and run overnight. During the day, doors and windows will be opened by other trades and running a dehumidifier becomes ineffectual.

**Approximate drying times for air drying compounds**

| Relative humidity | Temperature |           |          |          |          |
|-------------------|-------------|-----------|----------|----------|----------|
|                   | 10°C        | 16°C      | 21°C     | 27°C     | 32°C     |
| 98%               | 26 days     | 18 days   | 12 days  | 9 days   | 6 days   |
| 94%               | 10 days     | 7 days    | 5 days   | 3 days   | 2 days   |
| 90%               | 6 days      | 4 days    | 3 days   | 49 hours | 36 hours |
| 80%               | 3 days*     | 2 days*   | 38 hours | 27 hours | 19 hours |
| 60%               | 42 hours*   | 29 hours* | 20 hours | 14 hours | 10 hours |
| 40%               | 29 hours*   | 20 hours* | 14 hours | 10 hours | 7 hours  |



# Joint Systems Recommendation – Seasonal Change

TE 10mm x 1200mm



The GIB® plasterboard range of air drying compounds caters for different weather conditions caused by seasonal change.

Air drying compounds (the compounds in pails) are held together by binders (glue). When these binders coalesce and cure, they bind the filler particles (mostly limestone) together which causes the product to go hard. How hard a specific compound will be to sand is dictated by temperature as it cures.

**The warmer the weather, the harder the product will become to sand.**

**The colder the weather, the softer the same product will become to sand.**

This can be seen when a compound that is great to machine or hand sand when applied on a hot summer's day is seen to be much easier to sand if applied on a cold winter's day. This can result in the winter application sanding too easily, resulting in swirl marks that ruin the finish when sanded, it may also be easily damaged if trade folk brush past a dry but not painted joint.

Conversely, a harder compound may sand well in winter, but become too hard if applied in very hot weather, or if in-line with sun shining through a window in summer resulting in direct UV penetration. This may result in the product becoming “glazed” as it is sanded and very difficult to sand.

To cure this issue there is a range GIB® compounds, each of which is optimised for warm, cold, or in-between weather use. It is up to the trades person to select the product most suited to the condition to ensure ease of sanding and quality of finish.

The GIB Trade Finish® range was developed to ensure a product is available that has similar rheological (trowelling) properties through the range, but different sanding characteristics to suit different seasons.

The harder to sand products should be used in the colder weather (winter). In these conditions the binder will not cure as hard, however it will still be hard enough to resist swirl marks, scratching and trade damage.

The easiest products to sand should be used in warm weather, when the binder will cure harder. This creates a surface that is easy to sand and can be machine sanded in summer with out leaving swirls and dig marks.

The table on the right shows the sanding characteristics of each GIB® compound.

**Remember.**









- Harder sanding products in cold seasons.
- Easier sanding products in warmer weather.

Change from one to the other for the cold and warm seasons if ultimate ease of sanding without swirl marks and scratching is desired. Use the chart to guide you to figure what will work best for you.

**For further information, contact the GIB® Helpline on 0800 100 442 or visit [gib.co.nz](http://gib.co.nz).**

**FEEDBACK**

We value your comments and would like to encourage you to let us know your thoughts on the GIB® compounds, systems, etc. Please send us your feedback and also for further information on any of the above, please do not hesitate to contact Edwin Zijderveld on (09) 633 0991 or email [edwin.zijderveld@gib.co.nz](mailto:edwin.zijderveld@gib.co.nz).

|  | Sanding/<br>Scrape         | GIB® Air Drying<br>Compound  | Setting<br>Compound  |
|--|----------------------------|--|--|
| warmer<br>↑<br>Weather Conditions<br>↓<br>colder | Very<br>easy<br>sanding    |  <ul style="list-style-type: none"> <li>– GIB Trade Finish® Extra Lite</li> <li>– GIB ProMix® Lite</li> </ul>            |  |
|  | Easy<br>sanding            |  <ul style="list-style-type: none"> <li>– GIB Trade Finish® Lite</li> <li>– GIB Plus 4®</li> </ul>                       |  |
|  |                            |  <ul style="list-style-type: none"> <li>– GIB U-Mix®</li> </ul>  |  |
|  | Moderate<br>sanding        |  <ul style="list-style-type: none"> <li>– GIB Trade Finish® Multi</li> </ul>  |  <ul style="list-style-type: none"> <li>– GIB Lite Blue®</li> </ul> |
|  | Harder<br>to sand          |  <ul style="list-style-type: none"> <li>– GIB Trade Finish® Heavy Weight</li> <li>– GIB ProMix® All Purpose</li> </ul> |  |
|  | Easy to<br>scrape          |  |  <ul style="list-style-type: none"> <li>– GIB Tradeset®</li> </ul>  |
|  | Scrape<br>white<br>“green” |  |  <ul style="list-style-type: none"> <li>– GIB Maxset®</li> </ul>    |

# 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.

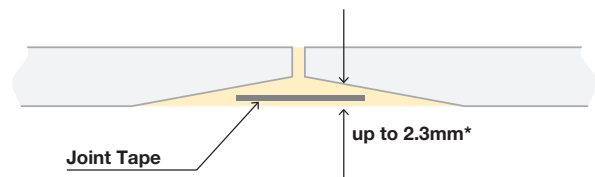
## Compound hardening/curing mechanism

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 (see diagram, total joint thickness can be up to 2.3mm). This makes it difficult/slow for moisture to evaporate from these coats and these thicker coats will take longer to dry.



\*AS/NZS 2588:1998 page 6

ABOVE: Board taper with depth measurement

## Use setting compounds for large voids

The AS/NZS2589:2007 page 44 standard states “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.”

## 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.

# Which compound can be used on a painted surface?

This is a popular question asked when doing patch work or a renovation.

To address this question lets get to basics. When a compound is applied to a new plasterboard surface it gets intermeshed with the fibres in the paper (Figure 1). The spaces in-between the fibres act as keying points for the compound to adhere. Setting compounds (plaster based) grow gypsum crystals in-between these microscopic spaces and bring about good adhesion to the paper. When air drying compounds (ready mix) are used, the glue (binder) in these compounds harden (coalesce) on drying and bring about the adhesion.

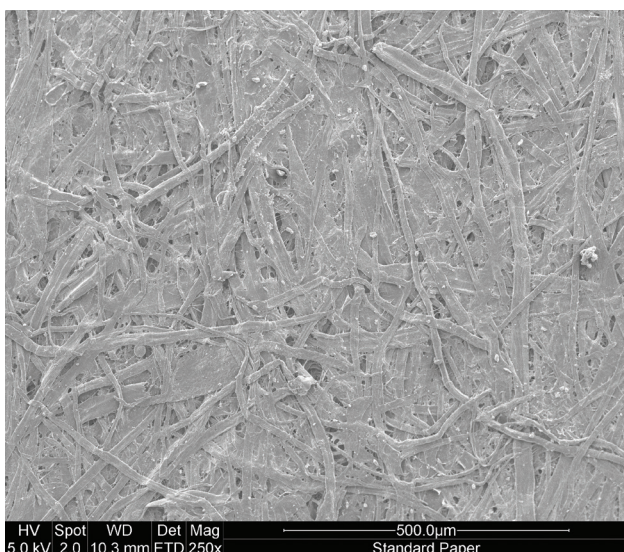


Figure 1 - Plasterboard surface showing fibres in the paper.

When painting a new plasterboard surface, the paint coats the paper fibres and forms a film over the whole surface (Figure 2).

Setting compounds do not get many keying points on a painted surface resulting in poor adhesion. On painted surfaces it is better to use an air drying compound with a relatively high amount of binder. GIB Plus 4<sup>®</sup> has a high amount of binder and Winstone Wallboards recommends using this when stopping over painted surfaces. A light sand of the painted surface before compound application improves adhesion.

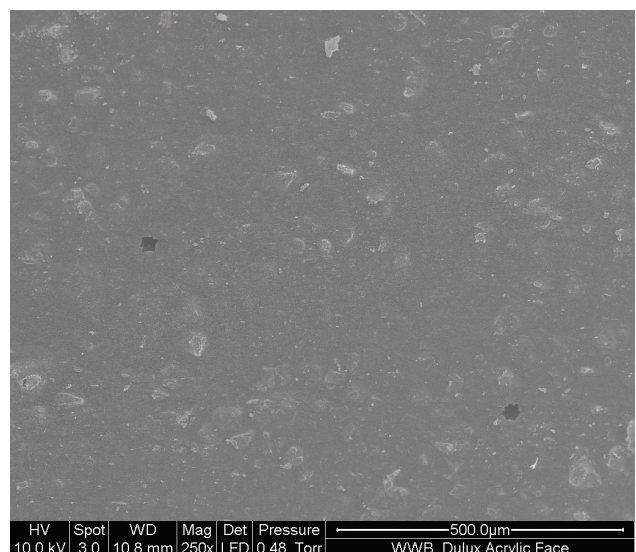


Figure 2 - Paint forms a film over the plasterboard surface.