

Grafotherm

Why do containers sometimes suffer from condensation?

When there is a fall in outside temperature this will mean that the humidity inside the container will allow droplets to begin to form on your container roof. This can cause damage to moisture sensitive goods in your container.

The temperature of your container ceiling can be much lower than the air outside and therefore it allows heavy condensation to form.

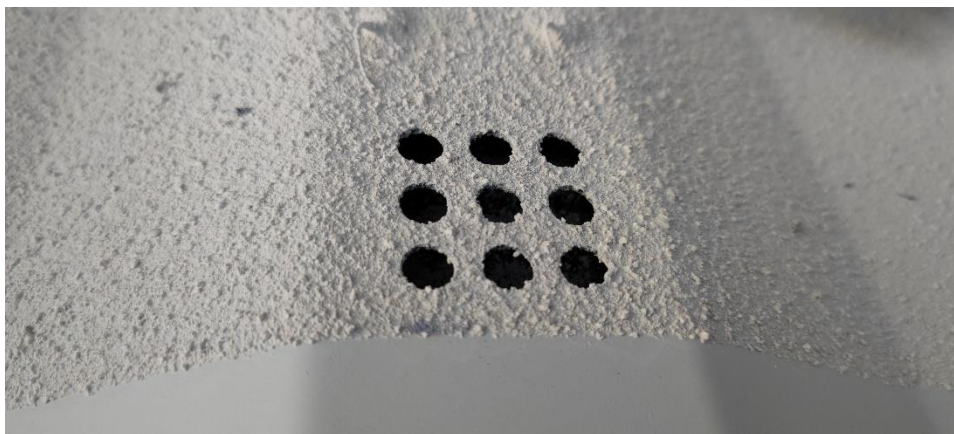
You will find that the likelihood of container condensation rises in the winter months.

What is grafo-therm?

Grafo-therm is a water-borne, spray coating, that is applied to the roof of your container while it is in the depot. It is sprayed on to the container ceiling and sometimes also at the very top of the container walls and front wall (though this isn't necessary).

It takes on a white/grey textured appearance with a very fine microporous structure and anti-condensation properties. It is possible to apply grafo-therm with a brush or a roller, but the best results occur when it is sprayed on.

It is used as a low-cost but long-term measure to combat container condensation, which is fire-proof tested.



Close-up of grafo-therm appearance

How does grafo-therm work?

Grafo-therm really is an incredible product. Applied to a 1.5mm thickness it can hold a litre of water per sq. metre. It is usually applied to the ceiling of your shipping container but is extremely rarely used on container walls also.

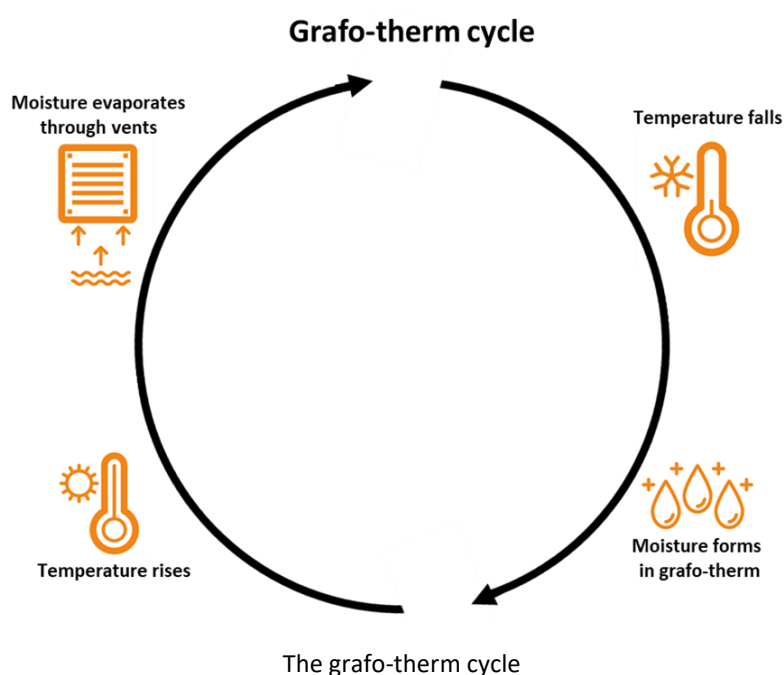
Grafo-therm has the following properties and benefits:

- **Insulative** – grafo-therm is somewhat thermally insulative, which means that the temperature differentials between the outside and inside of the container are not as stark (a factor that contributes to condensation). The mildly insulated ceiling surface remains slightly cooler.
- **High Absorbency** – it absorbs moisture so therefore condensation will not form or drip onto your stored items in the container.
- **Rapid Evaporation** – when the temperature begins to rise, the moisture will evaporate very quickly. This is because it thinly coats the grafo-therm and so turns into a gas rapidly.

Grafo-therm holds onto moisture using surface tension. The condensation isn't allowed to form on the surface of the grafo-therm because it is spread thinly throughout its internal arrangement. Grafo-therm helps to prevent dripping condensation, which means protection against moisture and water damage to your goods.

Grafo-therm facilitates faster moisture evaporation - when the temperature rises the coating will rapidly dry to restore the grafo-therm back to its original state. The moisture is safely released out of the container through the vents.

The grafo-therm will then be ready to absorb moisture again when there is another condensation-prone period.



It is important that your belongings don't lean against, or touch the roof of your container, otherwise it will not work correctly.

Very infrequently, customers ask for grafotherm to be applied to their shipping container walls, but it isn't recommended.

Does it matter how the grafo-therm is applied to my container?

Yes! Grafo-therm must be applied to the correct thickness (1-2mm) otherwise its performance is significantly diminished, which is why it's important that it is applied by an expert.

During application, grafo-therm is affected by the temperature of the ambient air and the relative humidity. Our depot staff will make sure that the ceiling of the container remains +3°C higher than dew point and both the temperature and humidity are suitable before proceeding.



A grafo-therm treated 20ft container

Is grafo-therm susceptible to mould?

Since grafo-therm leads a life in frequent contact with moisture it contains a strong fungicide. This creates an adverse environment for mould, preventing its growth. The fungicide lasts for many years, giving you peace of mind.

Do I really need grafo-therm?

Our addition of extra vents on all four sides of the container, and now with the XL vents mean that airflow is increased in the container, which is effective at reducing condensation risk. Anecdotally our customers say that this does a great job at fighting condensation for them, but ultimately it's your decision whether to grafo-therm or not.

For customers who store materials such as clothing and fabrics then these are more prone to moisture and water damage so the decision about whether to buy grafo-therm should be taken carefully.

If you are a customer who is storing equipment that is not affected by moisture, then grafo-therm wouldn't be necessary for you.

What if the belongings in my container are very expensive?

If you are storing items that are very expensive and would be affected by condensation, then ply-lining and insulating your container would likely be the best approach.

How long does Grafo-therm take to apply?

Grafo-therm dries at different speeds depending on the time of year. In the winter it will need to be force dried, whereas in the summer it will naturally dry very quickly due to the warmer weather. An important part of the grafo-therm application process is allowing it sufficient time to cure. The depot team won't send out a container which isn't ready because the condensation-fighting properties of the grafo-therm would be impacted. In optimum conditions, curing will take around 2 days so please factor this into your lead time.

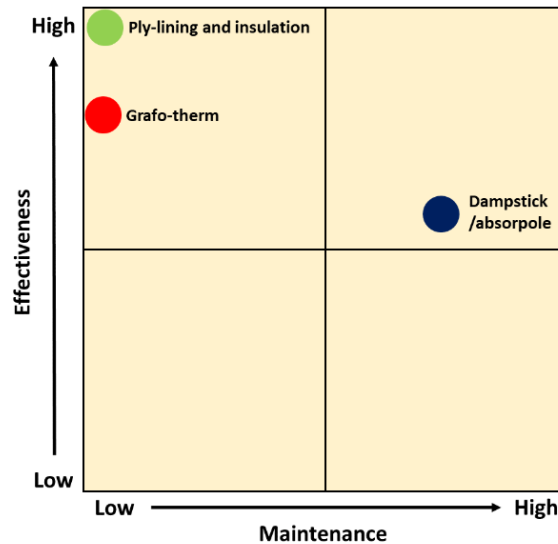
What other anti-condensations are available?

Grafo-therm is a cost effective solution, but some customers will choose other methods of combating condensation such as insulating their container and ply-lining it. This is a much more expensive approach, however.

For some customers who only want an anti-condensation solution which is only very short-term then dampsticks are a viable option. They need to be changed regularly (usually every 12 weeks) so the costs can add up quickly, not to mention the inconvenience. These desiccant-based solutions do not offer the same benefits of being able to buy it and forget about it, which grafo-therm and ply-lining provide.

Below, you can see where the most popular anti-condensation treatments sit on the matrix.

Condensation Treatment Matrix (CTM)



The Condensation Treatment Matrix

What if I want even more protection against condensation?

Grafotherm isn't a complete panacea to condensation, but it has proven itself to be a highly effective measure for customers since its introduction.

It can be used in conjunction with absorpoles for even greater peace of mind, or the more costly option of ply-lining and insulation could be explored, as mentioned earlier.

Can grafo-therm be applied after the container has been delivered?

Technically yes, but it would need to be done by a company that is competent at applying it in situ at your site. The cost and time taken to complete it will be dictated by the time of year and weather conditions. For self-storage customers who want their containers to be 'grafo-thermed' they will need to ensure that their customers' belongings are out of the container for the whole duration of the grafo-therm treatment, which can pose some logistical difficulties! Typically, the cost to retrospectively grafo-therm a container is higher than having it done by the depot staff prior to your container being delivered.