Better Dry than Sorry

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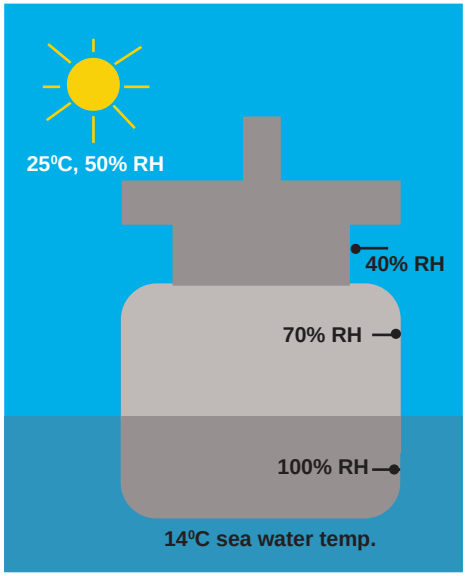
Humidity leads to corrosion, which shortens the lifetime and reduces the performance of machinery, metal structures, electrical installations and electronic systems.
High humidity shortens the storage life and lowers the quality of hygroscopic materials such as flour and paper. (Hygroscopic = tending to absorb and emit water vapour). In Norway alone, damages from corrosion, decay, mould, etc., amount to billions of kroner each year.

Dry air is the ticket

For many, the first thing that comes to mind when something has to be dried is to heat it.
However, raising the temperature does not change the moisture contents of the air. Trying to solve humidity problems in ships and oil platforms by heating is like trying to raise the temperature in the surrounding sea. It's expensive at best and impossible at worst. Dehumidification is a better and cheaper method. You simply remove a fraction of the water vapour content of the air so the air can "tolerate" lower temperatures before condensation occurs.
The solution is cheap, requires little energy and works at all temperatures, even below freezing.



Condensation occur on cold surfaces.

More about relative humidity and condensation:

Relative humidity (RH) is a measure of water vapour in the air as related to the maximum amount of water vapour the air can hold at the same temperature. Hot air can hold more water vapour than cold air can. Air with 50% RH at 20°C thus contains considerably more water vapour than air with 50% RH at 0°C.

Condensation arises when air is cooled below its dew point. An example is the dew on the outside of a bottle of soda taken out of the refrigerator on a hot summer day. To avoid condensation, the water vapour content of the air must be reduced to bring the dew point below the surface temperature. The air's dew point is the temperature to which the air must be cooled for condensation to occur.

Most products and materials "thrive" best in dehumidified air with 40-50% RH. The recommended RH for humans is between 30 and 70%, hence dry air in this context is by no means harmful to humans, but rather the opposite.

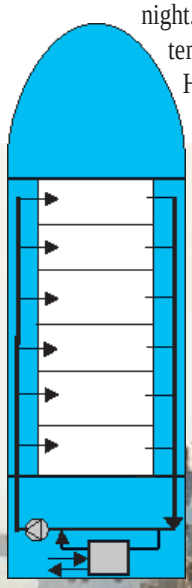
Corrosion can be stopped entirely if the relative humidity is kept below 50%. The outdoor air in Norway has an average 80% RH year-round.

No condensation will form on a surface if the air encompassing the surface has a dew point that's lower than the surface temperature.

Høegh keeps paper dry

When shipping paper from a cold to a warmer and more humid climate, the temperature of the cargo will "lag behind" and humid air from the outside will cause condensation to occur in the cargo hold, thus damaging the cargo. The same can also occur due to temperature differences between day and night. With an AG air drying system in their cargo holds, Leif Höegh & Co ASA and other shipowners can be sure their dry cargoes arrive dry and undamaged.

Paper products aren't the only goods that are sensitive to humidity. In fact most materials are. Høegh also dehumidifies cargo holds when shipping, e.g., cacao. Similarly, it is only logical that steel products and electronic/electrical equipment should also be shipped in dehumidified cargo holds to avoid corrosion and damage from moisture.



Dry conditions in cargoholds with dehumidifier from AG (photos: Høegh Fleet Services AS).

Save millions by dehumidifying rather than painting

Using dehumidifiers inside closed steel structures is an excellent alternative to surface treatment. An air-dryer system costs only a fraction of what it costs to blast and paint such structures on the inside. The corrosion protection is more secure and easy to control.

This applies to, e.g., box bottoms and oil platform legs, void spaces in ships and steel bridges.

AG's dehumidifiers have drastically cut costs for the Visund, Troll C, Njord and West Navion offshore installations as well as the Askøy and Grenland bridges.

AG AIR DRYER in action to provide dry conditions for surface treatment.

Dry for painting

Knutsen O.A.S. Shipping AS uses the AG Air Dryer container for blasting and painting ballast tanks, even when at sea. The method "keeps it dry until the paint is applied" - which would have been virtually impossible any other way.

AG Air Dryer provide dry conditions until surfaces are painted.

AG dehumidifiers in thruster rooms and lifeboats increase safety and reduce the need for maintenance.

Securing safety in operation

Transocean ASA uses AG air drying units in three thruster rooms on the platform Transocean Prospect, thus eliminating problems of high humidity and condensation in rooms with walls facing cold seawater. A dry indoor climate protects machinery and electronics against stoppage (due to rust, contact corrosion, etc.). The insulation resistance in propulsion engines increased significantly after the air dryers were installed. The air dryers reduce the need for maintenance.

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Preserving lifeboats

Transocean ASA also uses AG air dryers to dehumidify lifeboats. AG delivers air dryers for placement inside lifeboats as well as units placed out on deck for serving two or more lifeboats from the same unit. A dry climate without condensation inside the lifeboats protects onboard equipment against damage from moisture and ensures proper functioning in an emergency.

***Box bottoms**
***Platform legs**
***Void spaces**

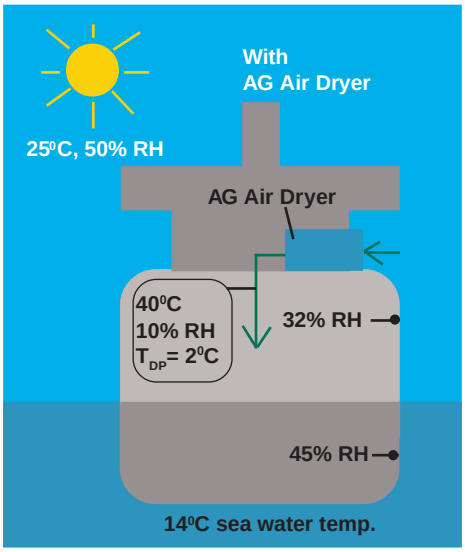
Installing an AG dehumidifier instead of painting has the following benefits:

- Major cost savings.
- Positive protection against corrosion.

AG dehumidifiers work regardless of temperature

Compartments/holds, cargo and equipment in the shipping and offshore industry are particularly vulnerable to damage from moisture.
The sea around ships and oil platforms maintains a constant, low temperature, resulting in many - and large - cold surfaces on the structures' insides, particularly below the water line. When warm and humid air comes into contact with cold surfaces, the air is cooled, causing air moisture to form drops of water (condensation/dew) on the surfaces.

This will also occur when ships sail through different climate zones, or because of temperature changes between night and day.
However, moisture damage occurs not only where you see dew or condensation. Moist air is harmful by itself. To stop corrosion, the air must maintain a relative humidity of less than 50% at the current steel temperature.
Consequently, you will need to control and reduce the moisture content of the air aboard.



The best way to avoid condensation on cold surfaces is by dehumidifying the air.

Reduced laytime for chemical tankers


Jo Ask, and other Jo Tankers vessels, have tank drying equipment from AG with 15.000m^3/h dry air.

AG - SC: Air dryers for chemical tankers

Air dryers are installed on chemical tankers for drying tanks after they've been cleaned. Corrosion-resistant materials are then needed. Regeneration is done with steam or thermal oil. Fans and rotors may be electrically or hydraulically driven.

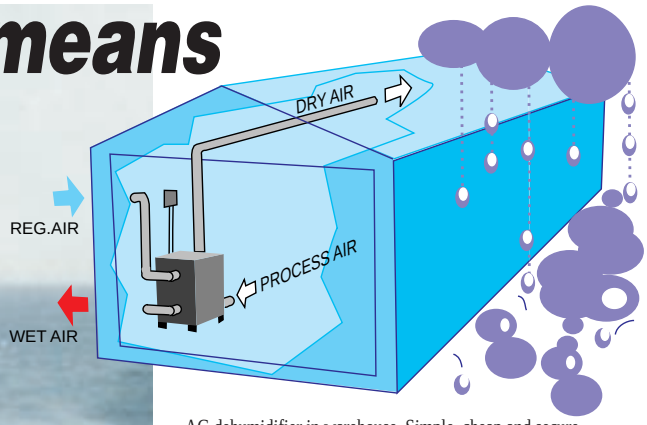
Salty air and strict standards for clean drying air call for high-quality filters. AG's rotors are especially favourable because drying agents are not emitted into the air.

With AG-SC, Alfsen og Gunderson AS has developed air dryers designed for such conditions.

AG-SC air dryers have been delivered to newbuildings for Jo Tankers, Odfjell, Seatrans, Bakri Navigation and Ermewa Maritime, among others.

For the Defence, dry means readiness

HMS Ark Royal, United Kingdom, is, until it´s due for a new commission, kept in a state of extended readiness by 29 DST dehumidifier units. (Photograph by the courtesy of the Ministry of Defence, U.K.)



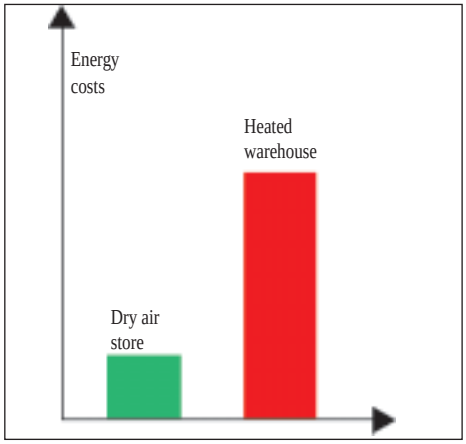
AG dehumidifier in warehouse. Simple, cheap and secure.

The Norwegian Defence has pioneered air drying methods with AG installations for more than 30 years in mobilization storehouses and also equipment used daily (tanks, aircrafts, etc.).

The dehumidifiers are controlled by a hygrostat, which reacts when the relative humidity exceeds the desired limit. With an AG dehumidifier in the storehouse, all equipment, including electronics, is protected against corrosion and moisture damage.

Secure and low-cost storage

Stavanger yard Kværner Rosenberg Verft has installed an AG dehumidifier in its main warehouse, which contains expensive valves and electronic components and where welding rods are packed. Reducing the RH to below 40% prevents general deterioration of quality. Time-consuming preservation work is avoided and energy consumption is reduced.



Dry-air storage provides better protection with far less energy consumption.

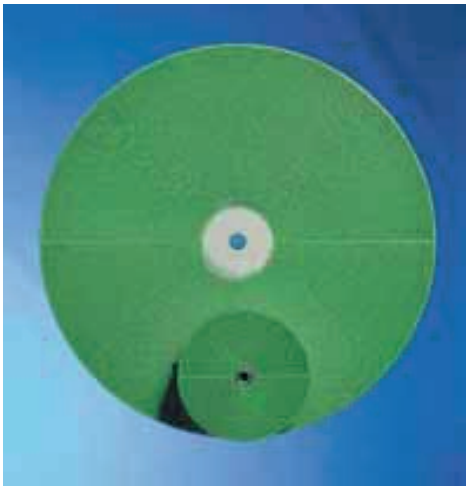
Alfsen og Gunderson AS with long experience in dry air technology

For more than thirty years, AG has been one of the leading players in the air drying industry. In recent years we have focused on developing equipment especially suited for the shipping, yard and offshore industries. This has resulted in our own air-dryer series: AG-SC for chemical tankers and our AG Air Dryer, a drying container for blasting and painting work.

AG is the representative in Norway for the Swedish dehumidifier manufacturer Seibu Giken DST, which has an extensive dehumidification programme with dry-air volumes from 190m3/h to 13,500m3/h. DST air dryers are well-suited for most purposes such as dehumidifying cargo holds, warehouses, box bottoms or void spaces, preservation of equipment components, etc.

The original:

The rotor is the heart of our air dryers. Japanese manufacturer Seibu Giken (parent company of Seibu Giken DST) introduced the silicate rotor in 1984. With Seibu Giken's patented production process, the drying agent is chemically bound to the rotor structure, preventing the rotor from emitting dust (drying agent) into the air that is being dried. This means a long lifetime with maintained capacity. The rotor has high mechanical strength and can even be cleaned without washing away the drying agent. With a dehumidifier from AG, you can be sure the unit has a silicate rotor that is well-proven. The best guarantee our customers have is that most of the silicate rotors delivered the first few years are still operating and adsorbing moisture throughout the world. This also gives our customers low overall costs.



Well-proven SSCR silicate rotors means low lifetime costs for our dehumidifier-customers.

Seibu DST's air dryers are well-suited for most purposes.

AG-SC air dryer for chemical tankers.

Electronic hygrostat AG-RH-HC controls the air-drying installation and has a display showing the %RH.

AG Air Dryer container for blasting and painting work.

Some times you just need heat. AG's mobile electric air heater H 100 is well-suited for yards during winter time for raising the temperature in tanks, etc.

Alfsen og Gunderson AS

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