Which Resin Dryer Is Right For You?





Selecting the right resin dryer can be a challenging task, considering the multitude of options available. For many years, the choice was simply between hot-air and dehumidifying desiccant dryers. However, in recent years, new dryer types have emerged on the market, and processors now have at least five different types of dryers to choose from, each with its own benefits and limitations. In this article, we'll explore the different types of resin dryers available and discuss problems with the traditional 'time-based' drying process, which is typically inaccurate and can lead to over-dried or under-dried parts as well as wasted production time.

Types of Resin Dryers:

Hot Air Dryers

Hot-air dryers are a good choice for resins that have no affinity to moisture. Non-hygroscopic resins such as polyolefins, polystyrene, and PVC pick up only surface moisture from condensation when exposed to humid air. Hot-air dryers use heated ambient air to dry the resin pellets. They are simple, reliable, and relatively inexpensive compared to other types of dryers. However, hot-air dryers are not suitable for drying hygroscopic resins like nylon and polycarbonate.



dryers ideal for drying heat-sensitive resins that cannot be dried at high

Vacuum dryers use a vacuum to lower

Vacuum Dryers

the boiling point of water, allowing moisture to evaporate from the resin pellets at lower temperatures. By subjecting the resin to a vacuum environment, the boiling point of water decreases, allowing moisture to evaporate at lower temperatures. This reduces the risk of resin degradation or thermal damage, especially for heat-sensitive materials making vacuum

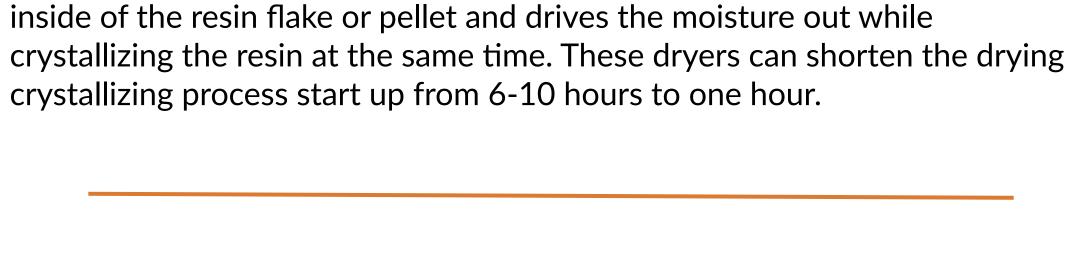
Infrared Dryers Infrared dryers use infrared radiation to heat the resin pellets, allowing moisture to evaporate. Infrared dryers are generally used in drying PET for

temperatures. Vacuum dryers have also come into the mainstream recently

because of their speed in drying and low cost of operation. The 30 lb./hr.

models are very well positioned for lab applications.

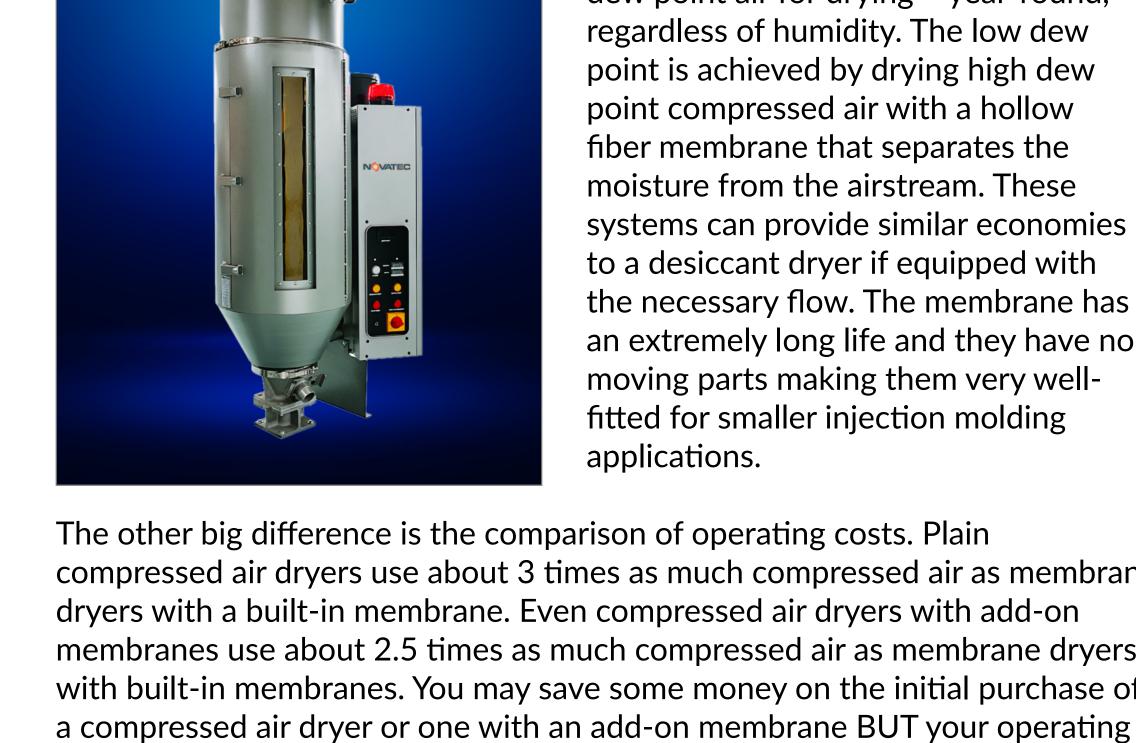
sheet and some fiber applications. They tend to have a higher cost than a typical desiccant dryer but can be very competitive when doing both crystallizing and primary drying. The infrared heat penetrates well to the





A compressed air resin dryer is a type of dryer used to remove moisture from

plastic resin using compressed air. The dryer uses a combination of heat and compressed air to dry the resin. A membrane dryer is a type of compressed air dryer that uses a membrane to remove moisture and other contaminants from the air; however, it is easy to get confused about the differences between membrane dryers and compressed air dryers but when it comes to resin drying it is critical to understand the differences. Firstly, compressed air dryers typically reduce the dew point of the incoming air by only 10 to 20 degrees F. That means if the incoming air is at a 40-degree dew point, your plastic pellets will only see "drying air" with a 20 or 30-degree dew point, despite the fact that resin manufacturers specify that most resins be dried by -40 degree dew point air. So in some geographic areas where it is typically humid, these compressed air dryers will not work very well at all. In climates that are typically dry in the winter but often humid during summer months, the compressed air dryer may work alright during the winter but have to be shut down during humid days in the Spring, Summer, and Fall. Conversely, Membrane dryers, much



point is achieved by drying high dew point compressed air with a hollow fiber membrane that separates the moisture from the airstream. These systems can provide similar economies to a desiccant dryer if equipped with the necessary flow. The membrane has an extremely long life and they have no moving parts making them very wellfitted for smaller injection molding applications. compressed air dryers use about 3 times as much compressed air as membrane dryers with a built-in membrane. Even compressed air dryers with add-on membranes use about 2.5 times as much compressed air as membrane dryers with built-in membranes. You may save some money on the initial purchase of

like desiccant dryers, produce -40° low

dew point air for drying – year-round,

regardless of humidity. The low dew

costs will be so much lower with the built-in membrane dryer that over a 10year period, you will save tens of thousands of dollars to dry your plastic resins. **Desiccant Dryers**

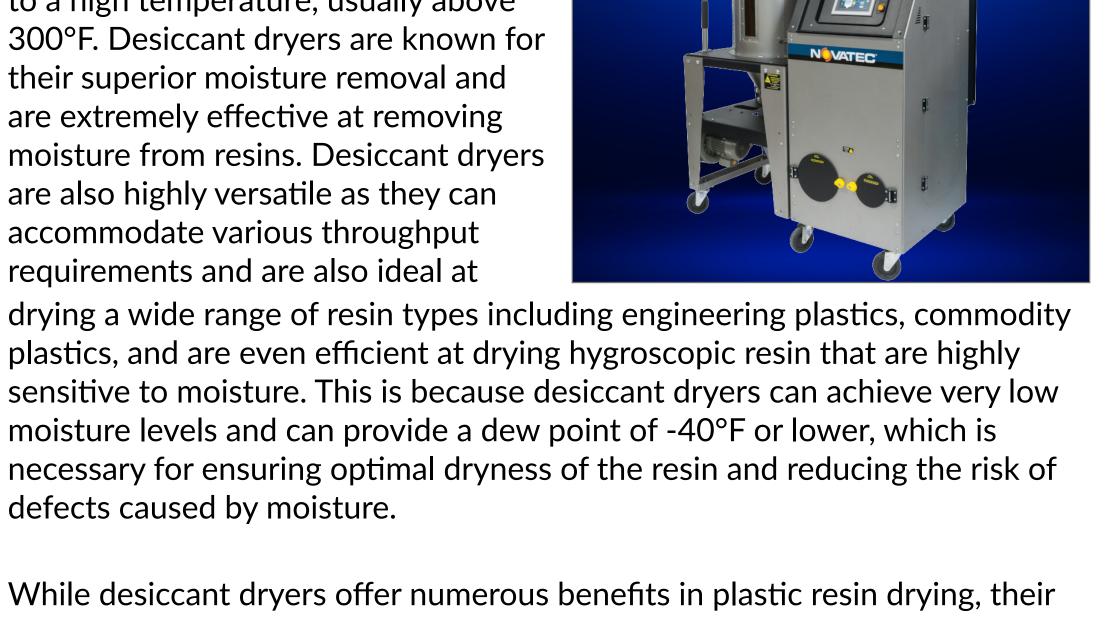
desiccant is regenerated by heating it to a high temperature, usually above 300°F. Desiccant dryers are known for their superior moisture removal and

are extremely effective at removing moisture from resins. Desiccant dryers are also highly versatile as they can accommodate various throughput requirements and are also ideal at plastics, and are even efficient at drying hygroscopic resin that are highly moisture levels and can provide a dew point of -40°F or lower, which is defects caused by moisture. intricate design and the advanced features of desiccant drying can add more

Desiccant dryers use a desiccant

absorb moisture from the air. The

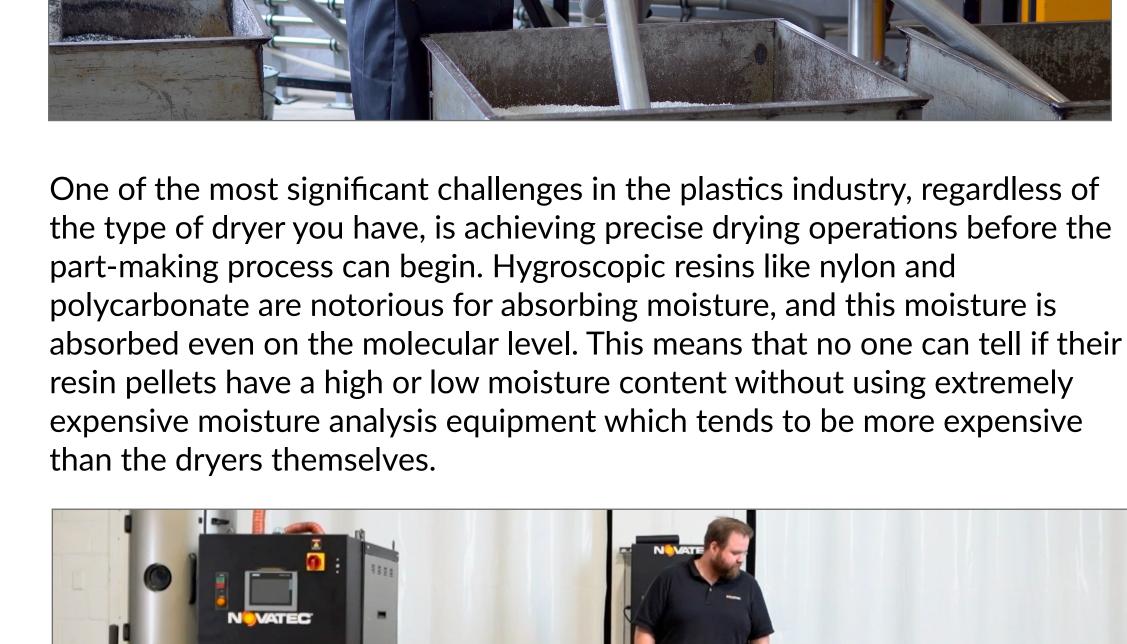
material, usually molecular sieve, to



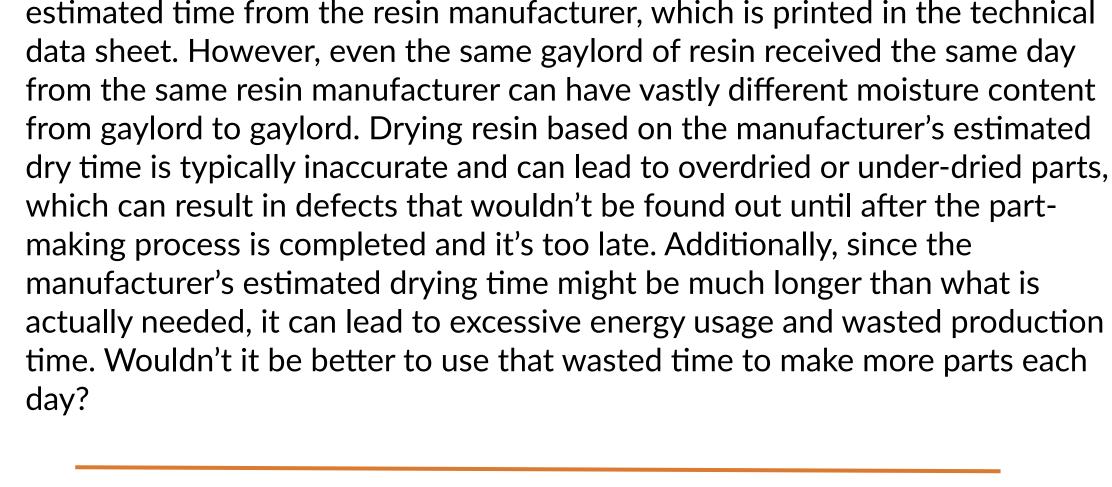
the product's warranty and the reputability of the manufacturer when making a purchasing decision. It's important to note that Baltimore-based, Novatec Inc, is known as the leader in quality when it comes to plastic resin dryers and provides a 5-year warranty on their equipment whereas most other manufacturers only provide a 1-year warranty.

Problems with the Traditional Drying Process

complexity to maintenance requirements. That's why it is crucial to consider



WET 3,500 PPM 1700PPM Because of this, processors traditionally dry resin pellets based on an estimated time from the resin manufacturer, which is printed in the technical which can result in defects that wouldn't be found out until after the partmaking process is completed and it's too late. Additionally, since the



nose and handle of a specialized DryerGenie pick-up lance, which

Introducing DryerGenie

Novatec has recently released a new

product called DryerGenie, which is a

revolutionary and affordable solution

based drying. DryerGenie consists of

to the inaccuracy of time-estimate-

a sensor array system built into the

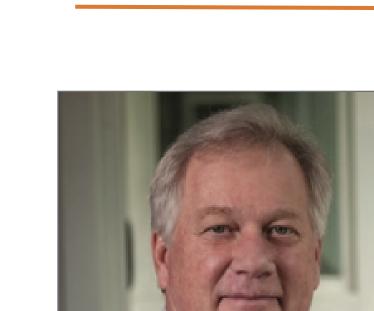
works in conjunction with an artificial intelligence software system to calculate the moisture content of the plastic resin during the pick-up process in the gaylord before the resin pellets are sent to the dryer. This moisture data is used by DryerGenie's A.I. software system to automatically adjust your dryer's parameters, such as residence dry time, temperature, dew point, and blower speed, to provide the most perfectly dried resin in the least amount of time. DryerGenie's A.I.-driven "moisture-based" drying ensures that processors can always make perfectly dried parts that are never over-dried or under-dried, resulting in significant savings. With DryerGenie, processors can save up to due to decreased energy usage.



\$50,000 per dryer each year, mainly due to increased utilization and partly



In conclusion, when selecting a resin dryer, it is essential to consider the moisture affinity of the resin being processed. Hot-air dryers are suitable for non-hygroscopic resins, while desiccant dryers are suitable for more hygroscopic resins. However, even with the right dryer in place, the challenge of achieving precise drying operations remains. Novatec's DryerGenie provides a solution to an intrinsic problem the plastics processing industry has been facing for over a half century and, at last, allows processors to make perfectly dried parts in the least amount of time while ensuring there is no wasted material or wasted production time. By using DryerGenie in combination with your dryer, processors can finally reduce their start-up times and increase utilization and efficiency so they can achieve their most desired goal: making more parts each day! To learn more about DryerGenie, visit www.novatec.com/dryergenie



Mark has been designing and installing dryer systems for over 40 years and has worked at Novatec, a leading dryer equipment supplier for the plastics industry, for 25 years. Mark is a well-known and well- respected resin drying expert. Throughout his career, Mark has visited thousands of plastics plants offering solutions for drying challenges and has authored many technical drying and

moisture-related articles.

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