

# PET drying, the energy-efficient way

The article pans out how an energy-efficient PET drying solution by Bry-Air bodes well for saving huge manufacturing costs.

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The Indian plastic industry has emerged as an integral part of the country's economy. Owing to the wide range of advantages it offers in the form of high-impact strength, high resistance, and flexibility, it is sought across industries for various applications. The inherent characteristic of being lightweight well complemented with the quality of sheer versatility makes plastic a suitable option for automobiles, healthcare, food packaging, building & construction, electrical & electronics, and many more sectors.

Gauging the increasing consumption of plastic in different walks of life, the plastic industry at present clocks Rs. 3 lakh crores market. And the government is enthusiastic to take the number to Rs 10 lakh crores market in a span of 4-5 years. Furthermore, there is a lot of responsibility on the manufacturers to produce plastics of the highest industry standard as the country exports plastics to more than 200 countries across the globe. It

becomes non-negotiable to compromise on the quality of the plastic. But the presence of moisture poses a severe threat to the entire plastic industry which can give rise to issues of splash, silver streaking, voids, blisters, gas bubbles, and haziness in the final product. Failing to extract the moisture during the processing can also account for the loss of tensile strength and compromise the structural configuration of the plastic.

As a result, efficient drying forms an imperative part of plastic manufacturing. With the domestic consumption of plastic surging year on year, calibrating a growth of 23 per cent, the industry is expected to reach 22 million MT in 2022-23. Furthermore, if IBEF reports are to be believed, then at present there are approximately 30,000 processing units in the country. Given to the huge demand for plastic in the market, manufacturers are



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always on the lookout to overhaul their drying process to reduce energy consumption and likewise the cost of the entire process. A similar situation is witnessed even in PET drying which is a popular form of plastic plagued with a high affinity for

moisture. PET drying is a complex process that involves various critical steps to keep the superior quality of the moulded product intact.

Traditional PET drying requires a temperature of 160°C maintained at -40° dew point for a residual time of 5-6 hours. Here, the return air coming out of the material drying hopper is at 70°C to 80°C. This air needs to be cooled down to achieve a temperature below 45°C before entering the desiccant drying system or honeycomb rotor/ drum. Failing to reduce the temperature can compromise the adsorption effectiveness. For which a cooling coil is installed to compensate extra heat of the return air. As PET drying can be done at 160°C temperature, there is a need to add extra energy to the dry air coming out of the desiccant system. Thus, energy is added at two levels.

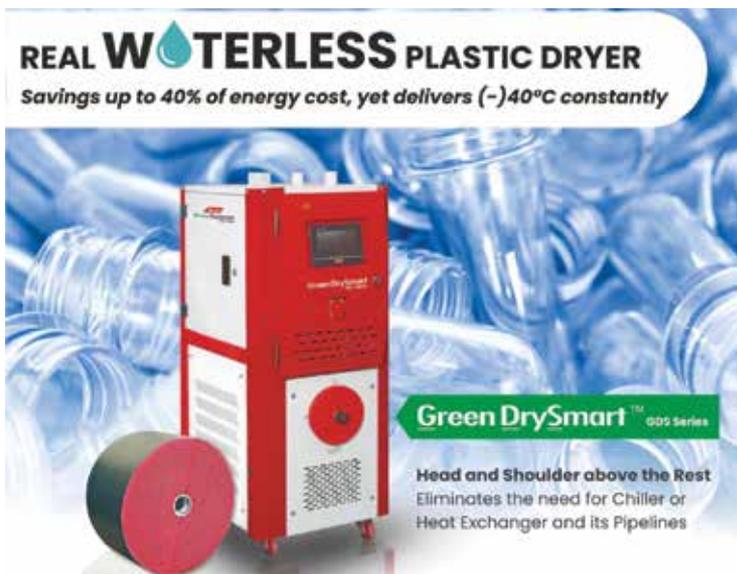
In order to rev the entire process, Bry-Air Green DrySmart (GDS) a pure manifestation of breakthrough desiccant dehumidification and adsorption technologies based on extensive knowledge and continual R&D, enables unmatched performance at an incoming air of 70°C instead of -40°C. Reigning on the 'art of drying,' it brings about the confluence of the waterless drying



technique with the honeycomb rotor technology, demonstrating the most energy-efficient way of PET drying. Consequently, the method exempts the need to install a cooling coil for compromising on the heat coming out of the chamber. Similarly, the air released from the desiccant rotor is at a higher temperature as compared to the air achieved through traditional drying. As a result, less amount of energy is required to reach 160°C. Analysing the entire process, it comes to light that a total of 40 per cent of energy is saved in the entire drying process.

Implementing the advanced desiccant drying process in

**THE PRESENCE OF MOISTURE POSES A SEVERE THREAT TO THE ENTIRE PLASTIC INDUSTRY WHICH CAN GIVE RISE TO ISSUES OF SPLASH, SILVER STREAKING, VOIDS, BLISTERS, GAS BUBBLES, AND HAZINESS IN THE FINAL PRODUCT.**



the Indian Plastic industry can contribute to saving up to INR 40 lakh kW energy annually with respect to 22 lakh metric tons of PET being manufactured every year. Consequently, the Indian PET processing industry can save a notional amount of approximately INR 3.2 crore annually. In addition to optimising manufacturing by achieving process excellence, PET drying also portrays health benefits.

It comes with the ability to minimise acetaldehyde formation during the drying process. 1 mg of

chipped/ peeled PET when heated at 150°C for 15 minutes initiates the formation of VOC gases which can be assessed with the help of an attached unit of gas chromatography adept at sensing the level of acetaldehyde. Acetaldehyde is a potent health hazard as the chemical comes with the ability to cause cancer. As India strives to expand its global footprint, it needs to comply with international standards considering that many countries follow the maximum acetaldehyde permissible limit very strictly.

To achieve this, a cooling coil added to the Bry-Air Green DrySmart (GDS) Dryer converts it to a Super Dryer, coming with expertise to deliver 12 times improved dry air by achieving a -60°C dew point. Cumulatively, GDS allows PET drying to be done in either energy efficient way or with the help of a Super dryer supporting drying to be done at 135°C for a residual time of 3-3.5 hours, ultimately reducing the formation of acetaldehyde.

Understanding the importance of the plastic industry in the economy, deploying efficient PET drying can contribute to cost-effective processes and at the same time can also keep the acetaldehyde level within safe limits. 📍

