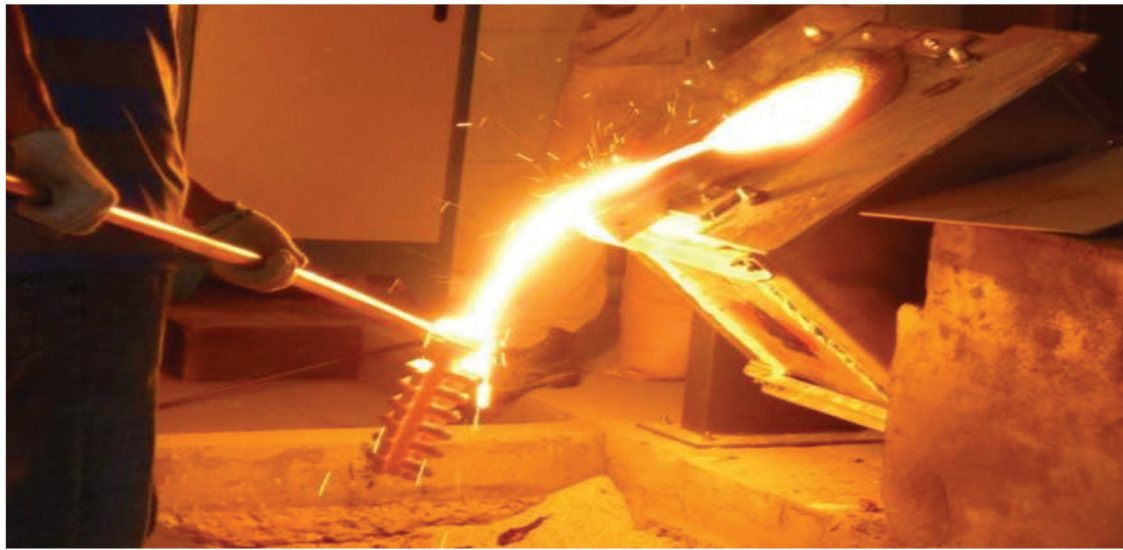


Case Study

Hi-Con Technocast Pvt. Ltd



Hi-Con replaces conventional equipment with DuCool Systems.

A precision Investment Castings manufacturing company needed a simple and cost-effective solution to manage its humidity related problems. Ducool Systems provided that solution with its liquid desiccant dehumidification systems. As a result, the company has been able to control humidity, reduce energy consumption, and save money on operating expenses.

Background

Hi-Con Technocast Pvt. Ltd. was established in 2003 by renowned industrial group of technocrats devoted to the production of complete spectrum of precision Investment Castings by Lost Wax Process for both Ferrous and Non-ferrous metals. Located in Rajkot, India, an area plagued by conditions with peak temperatures of 30-40 °C and a relative humidity of 60%.

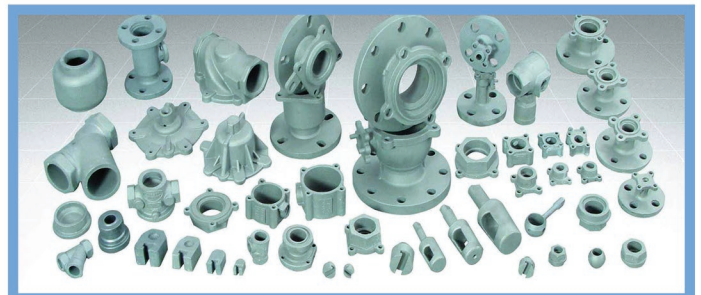
Challenge

Ceramic Coating involves 3 successive coats of ceramic slurry and 2 coats of refractory sand. Fused silica is then applied on assembled cluster/tree with intermediate drying time to form a self-supporting 'Shell' or called 'Mold'. Sand is used to increase the strength of the investment. In order to achieve smooth and uniform coating they had to maintain a temperature of 22°C at 45% RH.

Improper control of moisture caused the porcelain to lose its shape which ultimately hampered uniformity and consistency in their finished products. Excessive dryness in air lead to shrinkage of porcelain causing hairline fissures in the mold. Their process of investment casting required them to maintain stringent temperature and humidity control in order to deliver high quality products to the end users and to optimise their manufacturing output

efficiency. However, they had to achieve maximum productivity with minimum operation cost.

Hi-Con shared an air handling unit with other spaces in the facility, only the sand coating (ceramic coating) area required strict humidity control. Hi-Con initially attempted to maintain these conditions by using their existing conventional heating & Cooling System. However, the existing conventional heating & cooling system proved to be inefficient, due to its high operating costs. Hi-Con decided to seek a cost-effective and efficient solution for the plant's air treatment operations. Additionally, this solution had to be implemented with minimal modification to the existing system and could not compromise the desired conditions. DuCool provided them with the most efficient standalone solution with our revolutionary liquid desiccant technology.



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DuCool Advantage

Ducool dehumidification systems delivered Hi-Con a consistent, controlled environment for improved shell quality, thus enhancing the finished product and lowering the rejection rate. As our systems specialise in cooling and dehumidification, the drying cycle time is reduced significantly which results in increased productivity. Our units also supplied clean air by eliminating most airborne particulates and micro-organisms creating a healthier environment with improved working conditions.

Ducool also offered hicon with a solution to optimally control humidity and provide significant energy savings. Two DT Large machines (DT 2400/9 & DT 3400/9) treated 5800 CFM of air to remove a total product moisture load of 70 lb/hr. This helped Hi-Con maintain stable conditions which further resulted in continuous and uninterrupted production independent of the ambient conditions. Additionally, the overall utility cost was reduced by around 30% as compared to the previous conventional system. As Ducool system provides dehumidification with cooling, the load on the existing system reduced considerably without causing any inherent change in their existing system design. DuCool's patented, air conditioning systems dehumidify and cool the air simultaneously, eliminating the need to overcool the air to control humidity.

System Advantages

- Around 30% Energy cost savings
- Reduction in rejection rates
- Minimal Maintenance
- Reduced drying time
- Optimised productivity



How It Works

DuCool's cooling & dehumidification systems are based on liquid desiccant's natural removal of moisture from air. This non-toxic, brine solution cools, dehumidifies and cleans the air at the same time without ever needing to be replaced and without exiting the system. When heated, the liquid desiccant releases the moisture back outside in the form of warm, vapour air, eliminating condensation from any point in the system. Liquid desiccant is also a natural disinfectant, eliminating bacteria, microorganisms, and odour from the air in just one pass.

