Material Drying Portfolio

DESIGN BASIS: Drying solutions for multiple materials

Presentation of multiple solution suitable to dry different kinds of granules in accordance with customer specific needs.
Before presenting our range of, it's useful to analyse 2 focal points revolving around plastic raw materials:
Types of granules and moisture.

Granules types and sizes:

Granules: *dimension range: from 200 mm to few mm (5-6 mm)*

Micro-spheres (or micro-granules):*200-500 mm*
Can be conveyed by loaders fitted with cartridge filters with filtration degree of 20 mm

Powder: *dimensions less than 20 mm ("impalpable")*
Powder cannot be conveyed and treated by our loaders and dryers.

Granule Moisture divisions:

HYGROSCOPIC: *phenomenon of absorbing or attracting moisture from the air retaining humidity inside the molecular structure of the granule.*

NON-HYGROSCOPIC: *having little or no tendency to absorb moisture, maintaining humidity on the surface of the granule only.*

Why it's important to underline this difference?

Because humidity may seriously affect the final product quality, it needs to be removed as best as possible in order to avoid product flaws such as breakage and ripples.

Together with our analysis and experience, we are able to offer the best solution to our partners, in reference to the most advantageous and suitable dryers to offer. So to understand whether to suggest a HD dryer, perfect to evaporate moisture on the surfaces or a WD /MD/AD fitting to dry moisture on the inside of the granule as well.

HD – HOT AIR DRYERS

These dryers consist of a fan which takes ambient air into a heating chamber to heat it up to a set temperature. The hot process air is blown into a drying hopper, from the bottom to the top, passing by the granules thus heating them up and removing the moisture by stripping it off from the granule surface and evaporating in the hot airstream.
The return air is filtered by a cartridge filter and then partially or totally exhausted in atmosphere by a by-pass valve, thus optimizing drying cycle and improving energy saving.

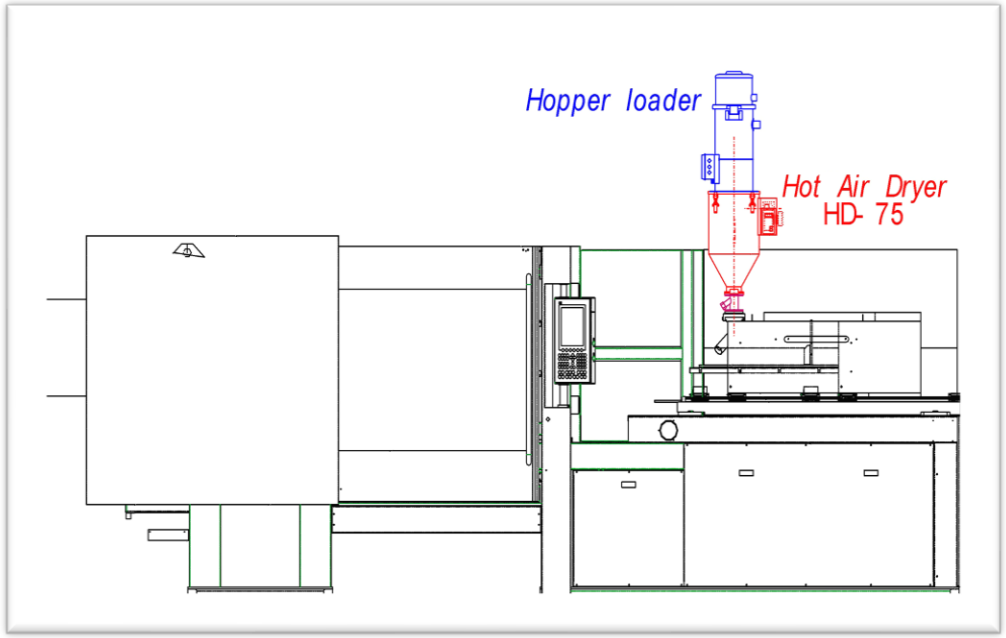
Characteristics:
Temperature range: *70 ÷ 150 °C*
Air Process range: *70 ÷ 170 m3/h*
Hopper volume: *from 30 up to 3000 dm3 as a standard, above on request*

HD version

HDC version

HDS version

Customizable solutions:



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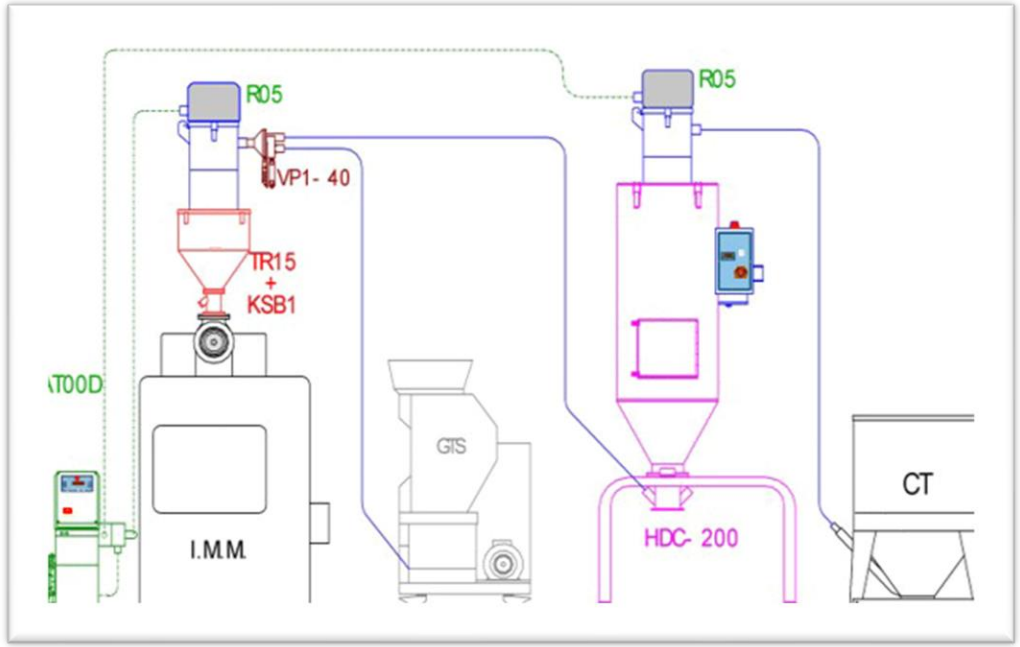

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MD – MOLECULAR SIEVES DRYERS

Able to handle even the most modern high-tech materials with a dedicated air flow and temperature control, that together with RCE function and dedicated thick insulated hoppers, create the perfect drying environment. These dryers represent an optimal solution from the smallest throughput up the higher ones, able to cope with the most demanding environment.
***MD/MDC** series is the generation of compact twin-beads desiccant dryers with modern design and extremely interesting technical performances and energy saving concepts.*
***MDS** series, designed and manufactured to remove the inherent moisture of the hygroscopic granules to very low residual values before processing, reaching a dew point of -50°C.*

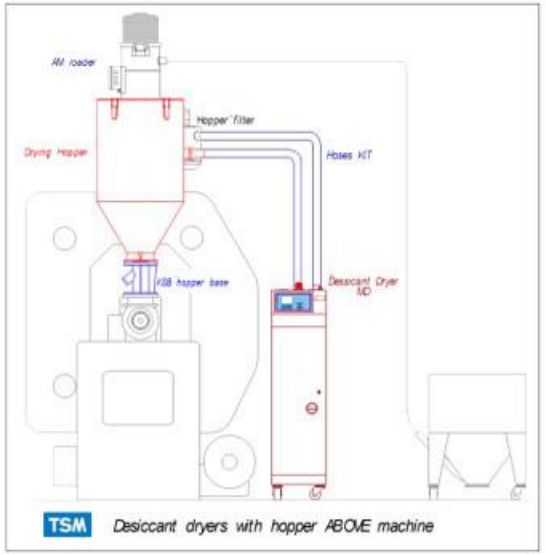
Characteristics:
Temperature range: **MT** *70 ÷ 150 °C* & **HT** *70 ÷ 190 °C*
Air Process range: *80 ÷ 850 m3/h*
Hopper volume: *from 50 up to 3000 dm3 as a standard, above on request*

MD version

MDC version

MDS version

Customizable solutions:



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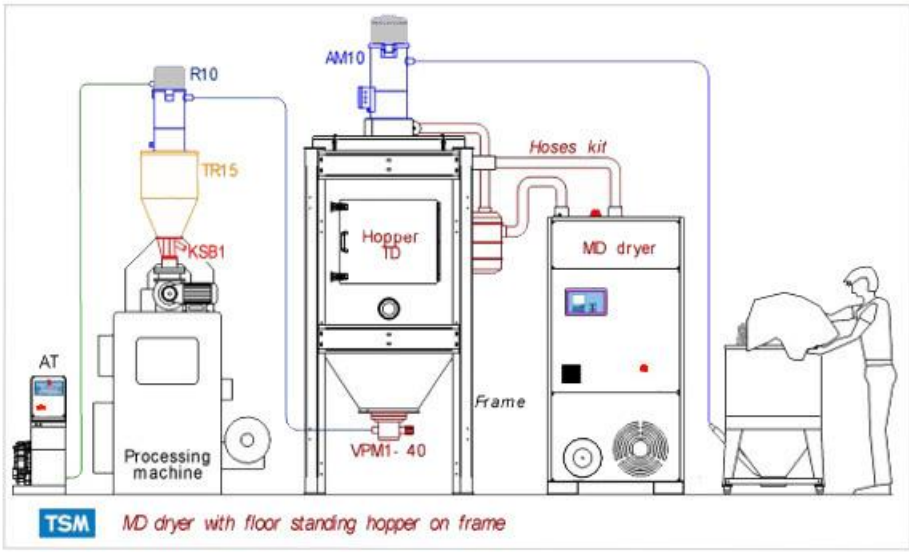

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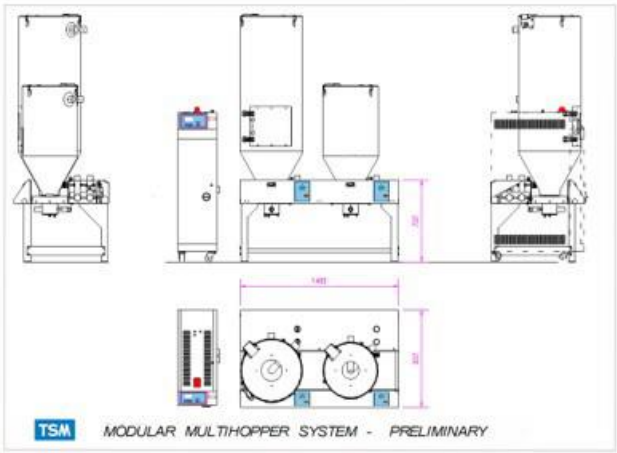


Multi-hopper

THE USE OF MOLECULAR SIEVES

MOLECULAR SIEVES “13X” made of synthetic crystalline aluminum silicates

*With important qualities of an adsorbent (desiccant), High “**adsorption**” capacity and possibility to be **regenerated** and used again.*

Molecular sieves are contained in cylindrical towers to perform the best airflow with reduced pressure drops with the most efficient air speed to transfer the moisture from air to the desiccant.

*Towers in **stainless steel** in order to avoid rust formation and reflect part of the heat produced internally during regeneration. Together with the outer insulation there is considerably reduction of heat losses (reduced energy consumption)*

AD / ADK – COMPRESSED AIR DRYERS

AD series designed to be machine mounted or with trolley for small medium throughputs. On its basic version hoppers have standard performances with dew point of -20°C.

*Utilizing the "**Extra Drying Kit**", version ADK, the performances rise up to -50°C dew point.*
The electronic control panel allows easy programming via the internal data-base of main materials, with the possibility of free implementation of the data by the operator. Besides It also allows modulation of the compressed air flow as a function of; the hourly capacity and type of material which, in combination with the anti-stress system, automatically reduces the power consumption.

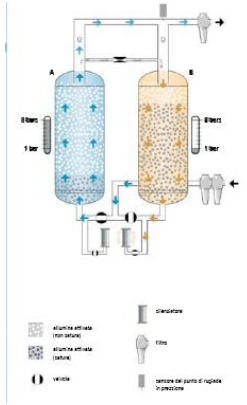
Characteristics:
***Hopper volume**: 5 up to 50 dm^3*

AD / ADK version
On-line

AD / ADK version
Off-line

THE USE OF COMPRESSED AIR

*The idea to use compressed air for drying, comes from the fact that compressed air is present in each plastic processing factory and it is also already partially dried. Compressed air when expanded at atmospheric pressure results having a **lower dew point** than when compressed. This effect can be used to dry polymers.*



Provide dew point:

*In the majority of industrial compressed air systems It has values of about +5°C with average pressure of 7 bar. Nevertheless, when compressed air expands from 7 bar to atmospheric pressure, the dew point results of **-21°C***

Improve dew point:

*This element can be inserted at a later step, or supplied already built-in the unit, the dew point results of **-50°C***

Helps saving the energy:

It is important to emphasize the aspect of energy consumption compared to traditional drying systems
In principle, AD units have a much lower installed power and in presence of the Extra Drying Kit, the regeneration is carried out only by compressed air expansion and not by heating resulting in a reduced energy requirement.

WD – ROTOR HONEYCOMB DRYERS

This series is based on the use of a rotating drum impregnated with a mixture of molecular sieves, granting a stable dew point of -45°C. This dryer, with a solid and proper air circuitry and the new Triflux air heat-exchanger permits to recover large part of the heat by reducing energy consumption of over than 30% compared to conventional drying system.

In addition, a WD doesn't require periodic maintenance to change sieves nor needs compressed air.
It may be possible however, to integrate water exchanger for process temperature over 140°C.

Characteristics:
***Temperature range**: **MT** 50 ÷ 150 °C & **HT** 70 ÷ 190 °C*
***Air Process range**: 15 ÷ 270 m3/h*
***Hopper volume**: from 30 up to 800 dm3 as a standard, above on request.*

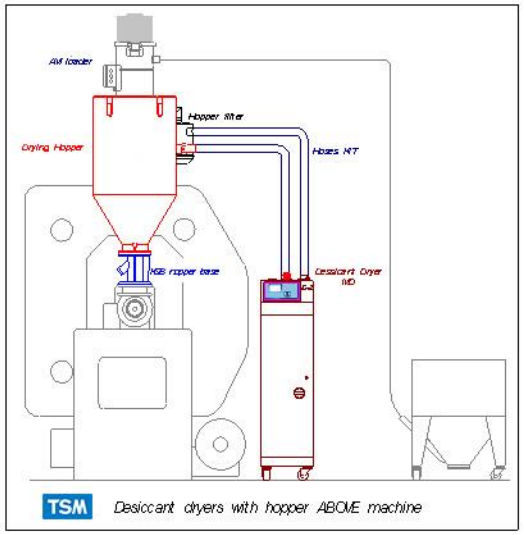
WD 15-30 version

WD 80-270 version

WDC version

WDS version

Customizable solutions



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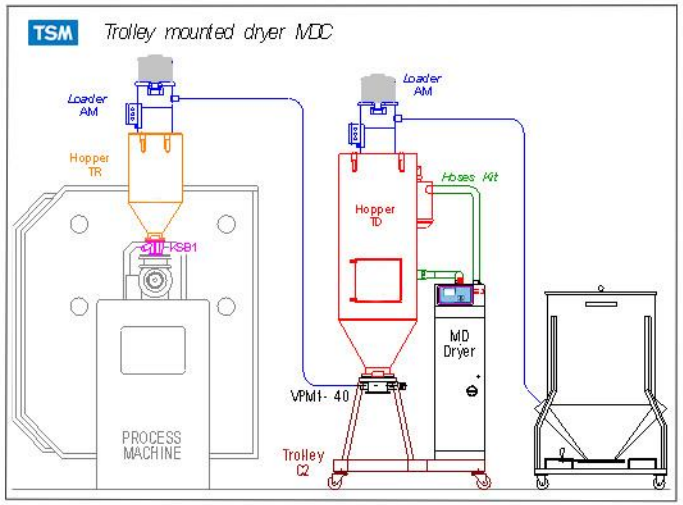

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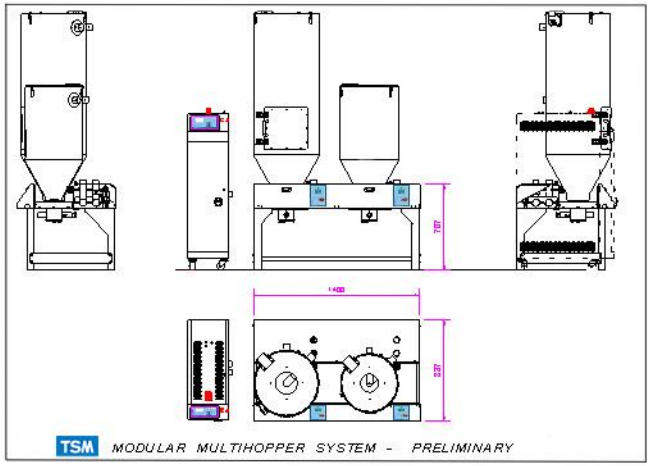

Multi-hopper

THE USE OF A ROTOR SYSTEM

Shape:

This solution is called honeycomb rotor dryer because the structure of the sieves looks like a bee hive.
The shape of this impregnated substrate in the rotor allows free airflow with reduced pressure drops.
Pure crystalline desiccant is embedded in a woven substrate, then permanently bonded onto the substrate which is consequently formed into a tightly wound wheel.

Continuous process:

The new matrix of silica gel and molecular sieves on desiccant wheels is key in delivering more and more efficient and reliable systems. The honeycomb rotor allows to have a continuous process phase with desiccant always in regeneration, always cooled down, to be always ready for process to adsorb humidity at its highest capacity. This solution allows operation with constant process air dew point at the lowest energy consumption and at its best operating conditions.

New Silica Gel mixture:

This modern mixture of molecular sieves and silica gel fixed in a matrix inside the honeycomb rotor has particular features of being regenerated by lower temperatures than usual molecular sieves granules require, thus reducing the electrical energy consumption. Moreover, the particular air piping and configuration allows to recover most of the thermal energy that would be exhausted. On WD80-270 series a system of heat exchangers, called TRIFLUX, is installed to recovery part of the discharged heat reducing further the energy consumption.