CE 540
Adsorptive air drying

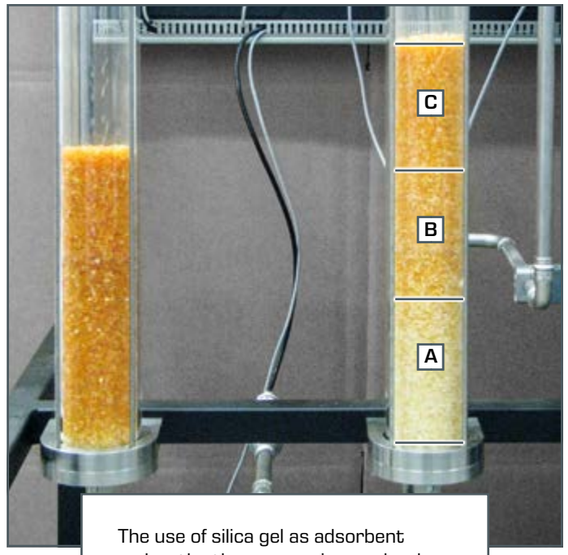
Adsorption processes are used in air pollution control. A typical example is the removal of hydrocarbon contaminants, such as those occurring during painting and printing processes. The CE 540 trainer allows you to clearly demonstrate the complex theoretical fundamentals of this process in the laboratory.

The device is designed for the adsorptive separation of moisture from an airflow. Silica gel is used as adsorbent for absorbing the moisture. This ensures safe operation for the device user. The silica gel discolours as the load increases, which also makes the adsorption process clearly visible.

1 adsorption columns
2 humidifier (water bath)
3 compressor for supply air
4 refrigeration system
5 flow meter
6 switch cabinet
7 heater for regeneration air

About the product:

www

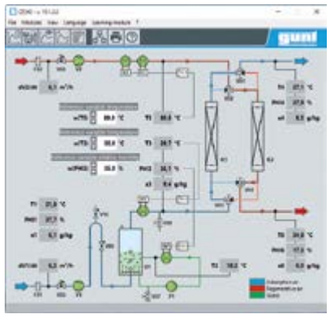


The use of silica gel as adsorbent makes the three zones in an adsorber clearly visible:

A loaded silica gel
B partially loaded silica gel (mass transfer zone)
C unloaded silica gel

Software

The clearly-arranged software included with CE 540 displays all measured values continuously. The software also functions as a controller for the temperature and moisture in the inflow of the adsorber. You can of course save all measured values for later analysis.



Principle of operation

The main components of the device are two columns filled with silica gel. First the moistened ambient air is fed into the columns by a compressor. Here the silica gel adsorbs the moisture present in the air. The silica gel can be regenerated once its maximum load is reached. The silica gel is regenerated via the passage of heated air. In this process, the silica gel returns to its original colour and can be used again. No consumables subsequently requiring disposal are used during this process.

Instrumentation

Temperatures and moisture levels are measured at all relevant points. This allows you to draw up a full balance for the process.

Learning objectives

- fundamental principle of adsorption and desorption
- investigation of the variables influencing adsorption and desorption
  - airflow rate
  - air humidity and temperature
  - bed height of adsorbent
- depiction of the processes in a h-ω diagram
- plotting of breakthrough curves
- determination of breakthrough time