



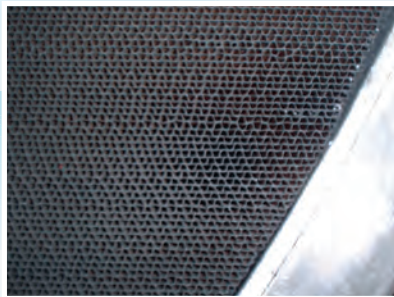
Why do Desiccant Rotors Fail?

One of the big advantages of modern desiccant dehumidifiers is that the desiccant material is inert, not easily liberated from the substrate, has a wide temperature tolerance, and normally is under low mechanical stress. Given adequate set-up and maintenance, a 15 or even 20 year lifespan is not unusual.

Nevertheless, several scenarios can compromise the life of the desiccant rotor, necessitating replacement. Given that the desiccant rotor is the heart of the dehumidifier, replacement is not a trivial expense. **Routine inspection can catch these failures in their initial phases and could avoid expensive replacement or refurbishment!**

Over-temp Failure:

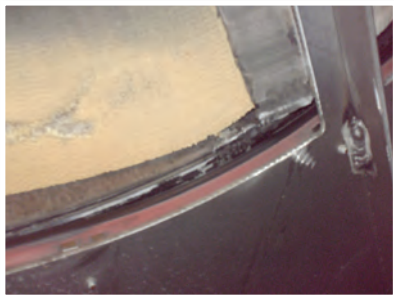
- › Caused by chronic exposure to reactivation temperatures in excess of the substrate media tolerance.
- › Symptoms include beige, pink, or white areas on the face of the desiccant rotor.
- › Brittle or powdery to the touch.
- › High temperature causes breakdown of surface face-hardening, causing erosion of the media from the reactivation entering/process air leaving side of the rotor.
- › Once the face of the rotor has been overheated, mechanical failure is certain and replacement or refurbishment is required.
- › Caused by improper reactivation burner set-up, lack of reactivation airflow, control system failure, poor filter maintenance, and/or failure of rotor drive system.



Normal Appearance of Rotor Face



Overheated Rotor Appearance



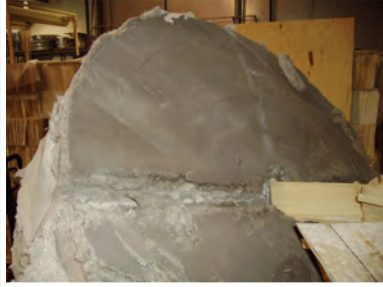
Overheated Rotor Appearance



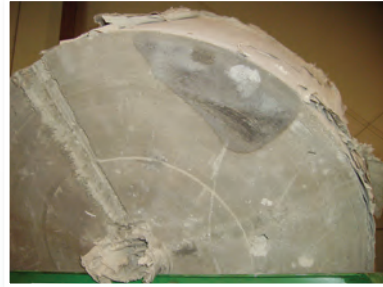
Ultimate Failure

Under-temp Failure:

- › Caused by high moisture loads with inadequate reactivation energy.
- › Chronic condensation within the rotor weakens substrate and causes breakdown of the process air entering/reactivation air leaving side of the rotor.
- › Soft or mushy to the touch. Might appear grey to black in color (mold). Often shows severe grooves.
- › Most prevalent with deeper (400 mm) rotors.
- › Caused by failure of reactivation modulation (stuck on low-fire), control system failure, pre-cooling or outdoor air mist carry-over into the rotor.



Chronic Under-temp Rotor Appearance



Chronic Under-temp Rotor Appearance

Plugging:

- › Caused by poor filter maintenance or improper filtration.
- › This is a preventable failure.
- › Symptoms include high static pressure differential, reduced process and reactivation air volume.
- › Reactivation direct-fired flame appears lazy and yellow.
- › Low amperage on reactivation and process fan motors.
- › Limited, dry material plugging might be removable with gentle vacuum cleaning and/or gentle compressed air blow-out.

Mechanical Failure:

- › Caused by careless maintenance personnel bumping into the desiccant media.
- › Can be caused by poor filter maintenance. When filters become overloaded they can be pulled through their frames by static pressure and into the desiccant media where they slowly erode the face hardening or jamb between the rotor and the sector seals.
- › Characterized by rotational shaped damage and no discoloration of the face.
- › Media from certain manufacturers can also suffer from catastrophic brittle failure where large pieces of media can separate from the rotor structure. These propagate from cracks that might be caused by vibration in shipment. Cracks can be stabilized if found early.



Mechanical Failure Rotor Appearance



Catastrophic Media Failure