



Desiccant Dehumidification Cassette Specification Guide

SECTION XXXX
DESICCANT DEHUMIDIFICATION UNITS

PART 1: PRODUCTS

1.1 DESICCANT DEHUMIDIFICATION SYSTEM

A. Desiccant Rotor

1. Moisture adsorbent media shall be uniform in nature and consist of an inorganic honeycomb impregnated with in-situ synthesized silica gel desiccant. The wheel media shall withstand temperatures to 600 degrees C without mechanical failure.
2. The rotor shall be both washable and non-shedding. Rotors shall be capable of withstanding cleaning by vacuum cleaner, with a water or, water and detergent wash.
3. The substrate shall be manufactured with an inorganic fiber matrix meeting the International Agency for Research on Cancer (IARC) standards for non-respirable fibers.
4. The ceramic substrate shall provide the structural support for the desiccant. The ceramic substrate shall be combined with desiccant to form the dehumidifier rotor. The desiccant shall be self-bonding to the ceramic substrate and to itself through the substrate voids filling in all the voids in the substrate and shall totally encapsulate the ceramic.
5. The desiccant dehumidification rotor shall be manufactured from flat and corrugated sheets of ceramic substrate interleaved in a winding to form the rotor creating a large number of axial passages through which the air flows.
6. The advanced metal silicate desiccant shall adsorb water molecules in the vapor phase.
7. Where a face and by-pass arrangement is indicated the performance shall meet the dew point values of the mixed air downstream of the face and by-pass section.
8. Rotor structure shall consist of radially-reinforcing plate steel members welded to a central hub of epoxy-coated steel. Outer rim shall consist of smooth, heat-resistant flanges where perimeter seals are installed.
9. Rotor surfaces shall be ground, polished smooth and coated for long seal life.
10. Rotor shall meet flame and smoke ratings per ASTM-E84-05 test method for NFPA No. 101 Life Safety Code of FSI ≤ 25 and SDI ≤ 25 .
11. Rated lifetime shall not be less than (87,600) hours and shall be defined by media performance meeting $>90\%$ of original specification.
12. Rotors shall be manufactured in an ISO-9001, ISO-14001 registered manufacturing facility.

B. Desiccant Rotor – Cassette Frame

1. Cassette Frames shall be manufactured from epoxy-coated welded steel tubing.
2. All welds shall be reasonably ground and dressed for appearance. Structural welds shall be continuous and non-structural welds shall be on 4" centers or plug welds.
3. Cassette face panels and other sheet steel components shall be manufactured from stainless steel or galvanized material.

C. Desiccant Rotor – Shaft Components

1. Rotor shaft shall be manufactured from cold rolled steel and shall be mounted to the cassette frame with permanently-sealed pillow block-type external bearings.
2. Rotor shaft shall be fixed by lock collars and set screws to keep rotor and shaft centered inside the Cassette Frame.

D. Desiccant Rotor – Drive System

1. Wheel rotation shall be effected by an inverter-rated, geared motor or motor/reducer pairing recognized by a nationally-recognized testing laboratory and suitable for 60Hz operation.
2. The geared motor shaft will be fitted with a carbon-steel sprocket linked to a stainless steel drive chain whose tension around the rotor is maintained by a spring-loaded tensioning device. Geared motor shall be lubricated and maintenance free under normal operating conditions. Geared motor HP, Torque and Ratio vary due to DH Rotor sizes, see the unit schedule.
3. For ease of maintenance and chain alignment the geared motor shall be fastened to a steel plate which is fastened onto the cassette frame with standard hardware.
4. The drive assembly shall be optionally equipped with a rotation detection circuit which shuts down the dehumidifier and signals the operator through an indicating light on the control cabinet if the wheel is not rotating. Rotation controls, if required, shall be provided by others.

E. Desiccant Rotor – Seals

1. Air seals shall be sufficient to prevent leakage between the process and regeneration air streams up to differential pressures of 8” in water column and be of heat-resistant fluoropolymer elastomer. Seals shall be of dual-ply, full-contact configuration at the perimeter and in bulb configuration adjacent to the regeneration air stream. Seals will be adjustable by means of galvanized steel mounting strips secured by stainless steel bolts through stainless steel anchor clips.
2. Air seals are made of a high temperature seal material extruded from a high temperature fluoropolymer elastomer base or “Viton®” (a DuPont registered trade name). Rotor seals are rated for lifetime use. Rotor seals shall be rated for 400°F+ continuous temperature rating.
3. Outer rim shall be additionally sealed to the rotor using high-temperature-resistant RTV sealant. 100% Pure RTV (room temperature vulcanizing) silicone is a one-component caulking material with temperature ranges of -50°F to 450°F.
4. All other areas that have a potential for air bypass shall be RTV silicone sealed, this shall eliminate and ensure that no air bypasses the rotor cassette assembly.