**DAL 359 Specifications**

**1. Description and physical characteristics**

1.1 The high induction swirl airflow diffuser shall be made of 20 ga. galvannealed steel. Blades shall be integrated to the round or square front plate.

1.2 The 90 mm long UL94 certified plastic blade shall permit a horizontal air flow over 180 degrees.

1.3 The diffuser's front plate shall be adapted to fit regular North American suspended ceilings or classic gypsum ceilings.

1.4 The blades shall be adjustable in two positions to reduce the diffusion area of 50%.

1.5. The diffuser shall be powder coated with a polyester TGIC-free paint, providing a smooth, easy-to-clean, chip and fade resistant finish. The architect or client shall choose a standard colour from the RAL colour chart.

2. Performance

2.1. The performance shall be guarantee by using performance curves or simulation software for critical areas. These shall indicate the pressure drop, acoustic power it generates as well as showing a cross-sectional view illustrating the critical airflow path in cooling, isothermal and heating modes.

2.2. Parameters of guaranteed comfort

 2.2.1 The performance statistics of the diffuser shall reflect a maximum air speed of 0.15 m/s (30 ft/m) in occupied zone at 1.3m (4 ft) from the floor. The performance guarantee shall be demonstrated in plan view with circles showing the path of the air stream.

 2.2.2 The diffuser shall ensure a maximum variant in temperature of -1°C between the air jet and the area occupied in 4 ft (1.3 m) from the floor. To achieve this, the ratio of temperature differential shall perform at minimum of ΔTxy / ΔT0 ≤ 0.1 (for an initial differential at ∆T0 = -10˚C).

2.2.3. In cooling, the diffuser shall guarantee in variable volume (VAV) a critical distance (Xcrit) of at least that which is indicated in the following table :

**Diffuser inlet** : 6 in.

 Maximum air flow : 80-150 cfm

 Minimum air flow: 20-40 cfm

 X critic : 1ft.-7 in. (0,5 m)

**Diffuser inlet** : 8 in.

 Maximum air flow : 151-280 cfm

 Minimum air flow : 41-90 cfm

 X critic : 1 ft.--11 in. (0,6 m)

**Diffuser inlet**: 10 in.

 Maximum air flow : 281-400 cfm

 Minimum air flow : 91-140 cfm

 X critic : 2 ft.--3 in. (0,7 m)

**Diffuser inlet**: 12 in.

 Maximum air flow : 401-600 cfm

 Minimum air flow : 141-200 cfm

 X critic : 2 ft.--7 in. (0,8 m)

2.3 **Ez = 1.0**

The air diffuser shall meet the ACE air change effectiveness value or the ASHRAE 129 standard ratio of Ez=1.0 This value shall be measured according to the ASHRAE 129 standard by an independent laboratory.

Note : This Ez=1.0 value has been applied to this project and will result in a reduction of the heating and cooling capacities of the units.

**3. Plenum**

3.1 The diffuser shall be delivered with a plenum made and tagged by the diffuser’s manufacturer. The plenum is constructed from 24-gauge galvanized steel and includes a perforated stabilizing (equalizing) plate which regulates the airflow rate. Four suspension points which adhere to paraseismic standards are integrated in the plenum. The inlet shall be centered on the side or on the top of the plenum, and its size shall be calibrated to accommodate the airflow rate. The joints of the plenum shall be sealed with caulking which is free of VOC (volatile organic compounds) emissions.

3.2 The diffuser front plate shall be attached to the plenum by a central screw.

3.3 When required, the plenum shall be supplied with a damper adjustable through the finished side of the front plate, in order to adjust the volume of air. This damper shall be available in two options:

 3.3.1 Radial damper: Key with circular pivoting blades on a flexible metallic cable shall be adjustable through the front plate of the diffuser allowing for air flow adjustment of 0% to 100%.

 3.3.2 Axial damper: Perforated swiveling flap from 0 to 90 degrees with a blocking system allowing for air flow adjustment of 25% to 100%.

**4. Balancing**

4.1 Balancing of DAL 358 diffusers shall be performed by a professionally certified technician, trained in ventilation system balancing.

4.2 The technician shall take into consideration the correction factor for use of a balometer when regulating air volume.

**5. Quality required: NAD Klima, model DAL 359**