HOW NAD
# Training

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAL358</td>
<td>Ceiling diffuser: Square or Circular</td>
</tr>
<tr>
<td>SAL35</td>
<td>Linear diffuser</td>
</tr>
<tr>
<td>RRA</td>
<td>Duct diffuser with slots</td>
</tr>
<tr>
<td>RDD</td>
<td>Duct diffuser with perforation</td>
</tr>
</tbody>
</table>
What you need to know before you start?

- What type of application?
- What is the usage? (heating/air conditionning/Ventilation)
- What is the installation height?
- Are there any obstacles?
- What is the total airflow rate?
DAL358

- Swirl airflow
- Square or circular front plate
- Plenum included

[Video] swirl airflow
**DAL358**

- 16x16 (400x400), 20x20 (500x500), 24x24 (603x603) ou 32x32 (800x800)
- Ø12 " (300), 16" (400), 20" (500), 24" (600) ou 32" (800),
- Gypsum Ceiling, T-bar or apparent (without ceiling)

*Note*: apparent ceiling Ø of front plate = Ø of diffuser
Useful information

**DAL 358 square**

<table>
<thead>
<tr>
<th>Cote DN</th>
<th>300/400</th>
<th>500</th>
<th>600</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø inlet</td>
<td>150 mm / 6 in</td>
<td>200 mm / 8 in</td>
<td>250 mm / 10 in</td>
<td>300 mm / 12 in</td>
</tr>
<tr>
<td>Weight (kg/lbs)</td>
<td>5.2/11.5</td>
<td>7.1/15.6</td>
<td>11.5/25.3</td>
<td>14.6/32.2</td>
</tr>
</tbody>
</table>

**DAL 358 round**

<table>
<thead>
<tr>
<th>Cote DN</th>
<th>300/400</th>
<th>500</th>
<th>600</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø inlet</td>
<td>150 mm / 6 in</td>
<td>200 mm / 8 in</td>
<td>250 mm / 10 in</td>
<td>300 mm / 12 in</td>
</tr>
<tr>
<td>Weight (kg/lbs)</td>
<td>4.2/9.3</td>
<td>6.2/13.7</td>
<td>8.5/18.7</td>
<td>14.1/31.3</td>
</tr>
</tbody>
</table>
Adaptability to the room

Available flow of air
Adaptability to room

Custom Plenum available if required

Plenum with oval inlet

min height = $\frac{\varnothing}{2} + 60$ mm (2-1/3 '')
(45+15)

Plenum with round inlet

min height = $\varnothing + 60$ mm (2-1/3 '')
(45+15)
Custom made (architectural)
## Quick selection

<table>
<thead>
<tr>
<th>Height of the room</th>
<th>Air flow by surface</th>
<th>Nominal size DN</th>
<th>Quantity of diffusers</th>
<th>Airflow per diffuser</th>
<th>Min. distance diffuser (m)</th>
<th>Min. distance wall (m)</th>
<th>Critical X (m)</th>
<th>Pressure difference ΔP (Pa)</th>
<th>Acoustic Power level Lw(dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,44 m / 2,75 m (8/9 ft)</td>
<td>9 15 24 30</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 24 30</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 24 30</td>
</tr>
<tr>
<td>3,05 / 3,7 m (10/12 ft)</td>
<td>9 15 27 37</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 27 37</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 27 37</td>
</tr>
<tr>
<td>4,0 / 4,3 m (13/14 ft)</td>
<td>9 15 27 37</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 27 37</td>
<td>DN 400 4 228 134</td>
<td>1.6 0.9 1.4</td>
<td>25 36</td>
<td>9 15 27 37</td>
</tr>
</tbody>
</table>

**Lw(dBA)**: The absorption of the room is not considered.

**Column for any room from that height at the same volume of air per diffuser**

**Column in reference to the example**

### Specifications:
- Room: \( L \times W \times H = 10 \text{ m} \times 10 \text{ m} \times 2.44 \text{ m} \ (33 \text{ ft} \times 33 \text{ ft} \times 8 \text{ ft})\)
- Total air flow in the room: 1400 cfm \( ④\)
- Initial temperature difference: \( \Delta T = -10^\circ \text{C} \)
- Air velocity: 0.15 m/s (30 cfm) 1.3 m
- VAV: 25%

Using the data on ceiling height \( ① \) and airflow rate by surface \( m^2 \text{ or sq. ft.} \), \( ② \) choose the nominal size (DN) of the DAL 358. \( ③ \)

Divide the total airflow rate of the room \( ④ \) by the ideal value of the air flow rate for the selected size. Adjust the quantity of diffusers to achieve symmetry in the room while respecting the maximum airflow rate in the optimal setting range. \( ⑤ \)

Watch for minimal distance between diffusers and between diffusers \( ⑥ \) and walls. \( ⑦ \)

### Location of the diffusers

![Diagram of diffuser locations]

### Airflow pattern - DN 600

![Diagram of airflow pattern]

Scale grid: 1 m  Blue: Air velocity >= 0.15 [m/s]
Range of application

<table>
<thead>
<tr>
<th>Connector diameter</th>
<th>cm</th>
<th>mm</th>
<th>inches</th>
<th>Optimal range of application (Maximum standard volume for office building)</th>
<th>Maximal range of application (Noise level higher than 33 (43-10) dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>8</td>
<td>DN 500</td>
<td>opt 240*</td>
<td>opt 360* 5</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>6</td>
<td>DN 400</td>
<td>opt 130*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>6</td>
<td>DN 300</td>
<td>opt 65*</td>
<td></td>
</tr>
</tbody>
</table>

* Ideal operating value in cfm

<table>
<thead>
<tr>
<th>Cfm</th>
<th>L/s</th>
<th>m³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>30</td>
<td>20</td>
<td>41</td>
</tr>
<tr>
<td>40</td>
<td>24</td>
<td>51</td>
</tr>
<tr>
<td>50</td>
<td>28</td>
<td>61</td>
</tr>
<tr>
<td>60</td>
<td>33</td>
<td>71</td>
</tr>
<tr>
<td>70</td>
<td>37</td>
<td>81</td>
</tr>
<tr>
<td>80</td>
<td>47</td>
<td>101</td>
</tr>
<tr>
<td>90</td>
<td>54</td>
<td>121</td>
</tr>
<tr>
<td>100</td>
<td>64</td>
<td>141</td>
</tr>
<tr>
<td>150</td>
<td>94</td>
<td>170</td>
</tr>
<tr>
<td>200</td>
<td>122</td>
<td>220</td>
</tr>
<tr>
<td>250</td>
<td>152</td>
<td>270</td>
</tr>
<tr>
<td>300</td>
<td>182</td>
<td>330</td>
</tr>
<tr>
<td>350</td>
<td>212</td>
<td>380</td>
</tr>
<tr>
<td>400</td>
<td>242</td>
<td>430</td>
</tr>
<tr>
<td>450</td>
<td>272</td>
<td>480</td>
</tr>
<tr>
<td>500</td>
<td>302</td>
<td>530</td>
</tr>
<tr>
<td>550</td>
<td>332</td>
<td>580</td>
</tr>
<tr>
<td>600</td>
<td>362</td>
<td>630</td>
</tr>
<tr>
<td>650</td>
<td>392</td>
<td>680</td>
</tr>
<tr>
<td>700</td>
<td>422</td>
<td>730</td>
</tr>
<tr>
<td>750</td>
<td>452</td>
<td>780</td>
</tr>
<tr>
<td>800</td>
<td>482</td>
<td>830</td>
</tr>
<tr>
<td>850</td>
<td>512</td>
<td>880</td>
</tr>
<tr>
<td>900</td>
<td>542</td>
<td>930</td>
</tr>
<tr>
<td>950</td>
<td>572</td>
<td>980</td>
</tr>
<tr>
<td>1000</td>
<td>602</td>
<td>1030</td>
</tr>
</tbody>
</table>
Simulation Software
Characteristics of room and air jet

560 cfm for the room
2 Diffusers @ 280 cfm each
Choice of the diffuser and type of diffusion

![Image of NAD AIR software interface showing selection of diffusers and their parameters.]
Simulation of air jet in the room

Distance between 2 diffusers = 3.9 m (13 ft)

Distance traveled by the air flow before reaching a velocity $\geq 0.15$ m/s or 30 fpm
Graphic simulation

DN Ø diffuser
Vertical distance travelled by the air jet before reaching the selected air speed

Air jet velocity
Horizontal throw distance travelled by the air

qv
Lw
ΔPt
Rapid evaluation of critical zones

Critical zone: Occupied zone where the air flow speed exceeds 30 fpm (0.15 m/s)

**NB**: Occupied zone: 4.3 feet (1.3 m) off the floor, when seated also called comfort zone.

**NAD Klima Has developed a graphic method of avoiding situations of discomfort**
Rapid evaluation of critical zones

Cfm of diffuser  DN Ø of diffuser  installation height

### DN 500

<table>
<thead>
<tr>
<th>L/S</th>
<th>PCM</th>
<th>8'</th>
<th>9'</th>
<th>10'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>m</td>
<td>in</td>
<td>m</td>
</tr>
<tr>
<td>71</td>
<td>150</td>
<td>0.8</td>
<td>30</td>
<td>0.5</td>
</tr>
<tr>
<td>75</td>
<td>160</td>
<td>0.9</td>
<td>33</td>
<td>0.6</td>
</tr>
<tr>
<td>80</td>
<td>170</td>
<td>1.0</td>
<td>39</td>
<td>0.7</td>
</tr>
<tr>
<td>85</td>
<td>180</td>
<td>1.1</td>
<td>43</td>
<td>0.8</td>
</tr>
<tr>
<td>90</td>
<td>190</td>
<td>1.3</td>
<td>49</td>
<td>1.0</td>
</tr>
<tr>
<td>94</td>
<td>200</td>
<td>1.4</td>
<td>53</td>
<td>1.1</td>
</tr>
<tr>
<td>99</td>
<td>210</td>
<td>1.5</td>
<td>59</td>
<td>1.2</td>
</tr>
<tr>
<td>104</td>
<td>220</td>
<td>1.6</td>
<td>63</td>
<td>1.3</td>
</tr>
<tr>
<td>108</td>
<td>230</td>
<td>1.8</td>
<td>69</td>
<td>1.4</td>
</tr>
<tr>
<td>113</td>
<td>240</td>
<td>1.9</td>
<td>73</td>
<td>1.6</td>
</tr>
<tr>
<td>118</td>
<td>250</td>
<td>2.0</td>
<td>77</td>
<td>1.7</td>
</tr>
<tr>
<td>123</td>
<td>260</td>
<td>2.1</td>
<td>83</td>
<td>1.8</td>
</tr>
<tr>
<td>127</td>
<td>270</td>
<td>2.2</td>
<td>87</td>
<td>1.9</td>
</tr>
<tr>
<td>132</td>
<td>280</td>
<td>2.4</td>
<td>93</td>
<td>2.1</td>
</tr>
<tr>
<td>137</td>
<td>290</td>
<td>2.5</td>
<td>96</td>
<td>2.2</td>
</tr>
</tbody>
</table>
Rapid evaluation of critical zones

Overhead view of room

Sectional view of room

Both circles touch: speed of airflow at 4.3 ft = 30 fpm
Rapid evaluation of critical zones

Both circles overlap: penetration of airflow in the occupied zone at a speed greater than 30 fpm.

Both circles do not intersect: the air flow penetrates the occupied zone with a speed of less than 30 fpm.
Rapid evaluation of critical zone

In the TOP view, NAD Klima has subtracted the vertical distance from the total throw of the diffuser.
Vertical Distance is the distance between the head of the occupant and the ceiling (1,3 m, 4 ft off the floor).

In order to obtain the Total Horizontal Throw at 30fpm, you have to add the Vertical Distance.

Example:
If Ceiling Height is 9'
Vertical Distance = 9' – 4' = 5'
You have to add 5’ or 60 to the horizontal radius of the Comfort Evaluation Circle.
Sample with CAD

Room 10m x 10m (33x33 ft) at 2,44m (8’)
4 DAL 358 DN 600 380 cfm each

VIDEO SAMPLE

CAD block with circles available on www.nadklima.com
# Technical spec chart NAD

NAD specifications DAL358

<table>
<thead>
<tr>
<th>Identification</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>NAD Klima</td>
<td>DAL358-Q-600-603-ST</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>D2</td>
<td>NAD Klima</td>
<td>DAL358-R-500-603-ST</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>D3</td>
<td>NAD Klima</td>
<td>DAL358-Q-500-603-ST</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>D4</td>
<td>NAD Klima</td>
<td>DAL358-Q-400-603-3W</td>
<td>1, 2, 3, 4, 5</td>
</tr>
</tbody>
</table>

Comments:
1 – Plenum with balancing damper must be supplied by the manufacturer.
2 – The color of the diffuser must be selected from the RAL chart, as well the colour of the rollers from our standard colors (withe, black, creme).
3 – The plenum with an acoustic insulation must be supplied by the manufacturer.
4 – The plenum is supplied with an inlet flange on TOP
5 – The plenum with a radial damper must be supplied by the manufacturer.
### DAL 358

<table>
<thead>
<tr>
<th>Q - Square</th>
<th>R - Round</th>
</tr>
</thead>
<tbody>
<tr>
<td>300, 400, 500, 600, 800</td>
<td></td>
</tr>
<tr>
<td>400, 502, 603, 800</td>
<td>(603 for 24&quot;x34&quot; T-bar)</td>
</tr>
</tbody>
</table>

#### Outer size

- **ST**: Standard helical airflow (21)
- **HL**: Flow rise (>5 m) (exterior 21 and center CD)
- **VF**: Vertical airflow (CD)
- **1W**: Airflow on one direction (21)
- **2W**: Airflow in two opposing directions (21 - 65)
- **2L**: Airflow in two directions in an L shape (21)
- **2C**: 90° airflow (corner) (21)
- **3W**: 180° airflow (wall) (21 - 65)
- **RB**: Roller nozzles (return)

#### Airflow

- **W**: White roller and receptacle (RAL 9003)
- **C**: Cream roller and receptacle (RAL 9010)
- **B**: Black roller and receptacle
- **X**: Without roller

#### Drum and receptacle color

- **9003**: White
- **9010**: Cream
- **008B**: Solar Black (Standard black matte)
- **005M**: Silver Mat (Standard metallic grey)
- **RAL**: RAL color (write color number of RAL)

#### Diffuser color

- **S**: Plenum with side inlet
- **T**: Plenum with top inlet
- **X**: Without plenum

#### Acoustic insulation

- **I**: With acoustic insulation
- **A**: With closed cell acoustic insulation
- **X**: Without insulation

#### Fireproof insulation

- **F**: With fireproof insulation et fireproof damper
- **X**: Without fireproof insulation et fireproof damper

#### Balancing damper

- **D**: With axial damper (for side inlet only with standard adjustment)
- **R**: With radial damper (standard for top and side inlet) *
- **X**: Without damper

### DAL 358 - Q - 300 - 603 - ST - W - 9003 - S - I - F - D

<table>
<thead>
<tr>
<th>Annotation</th>
<th>Example</th>
</tr>
</thead>
</table>

**Notes:**

*Blue: Standard, in stock*

*Not available on oval collar*
Technical Specs

1. Description and physical characteristics

1.1. The high induction swirl airflow diffuser will be made of 20 ga. mat finished steel. The round or square front plate has integrated eccentric adjustable rollers.

1.2. The 105 mm long eccentric rollers will have an alphanumeric identification which will permit the adjustment of the air flow pattern over 180 degrees.

The eccentric rollers meet the requirements of the National Building Code, Section 3.1.3.2, and certified according to the standard ASTME 162 "Surface Flammability of Materials Using a Radiant Heat Energy Source".

Eccentric rollers are available in black, cream or white.

1.3. The diffuser’s front plate is adapted to fit regular North American suspended ceilings or classic gypsum ceilings.

1.4. The diffuser plate is available for air flows of 1, 2 or 3 directional configurations as well as corner or “L” shapes.

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

2. Performance

2.1. The diffusers’ performance must be confirmed by simulation software for the critical area. This software indicates the pressure drop, acoustic power it generates as well as showing a cross-sectional view illustrating the critical airflow path in cooling, isoenthalpic and heating modes.

2.2. Parameters of guaranteed comfort

2.2.1. The performance statistics of the diffuser should 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 must ensure a maximum variant in temperature difference 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 must perform at minimum of $\Delta T_{ax} / \Delta T_{x} \leq 0.1$ (for an initial differential at $\Delta T_{0} = -10°C$).

2.2.3. In cooling, the diffuser must guarantee in variable volume (VAV) a critical distance ($X_{cr}i$) of at least that which is indicated in the following table:

<table>
<thead>
<tr>
<th>Diffuser inlet in.</th>
<th>Air flow maximum cfm</th>
<th>Air flow minimum cfm</th>
<th>X critical ft. (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>80 - 150</td>
<td>20 - 40</td>
<td>1’’7” (0.5)</td>
</tr>
<tr>
<td>8</td>
<td>151 - 280</td>
<td>41 - 90</td>
<td>1’’11” (0.6)</td>
</tr>
<tr>
<td>10</td>
<td>281 - 400</td>
<td>91 - 140</td>
<td>2’’3” (0.7)</td>
</tr>
<tr>
<td>12</td>
<td>401 - 600</td>
<td>141 - 200</td>
<td>2’’7” (0.8)</td>
</tr>
</tbody>
</table>

3. Plenum

3.1. The diffuser is 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 para seismic standards are integrated in the plenum. The inlet is centered on the side or on the top of the plenum, and its size is calibrated to accommodate the airflow rate. The joints of the plenum are sealed with caulking which is free of VOC (volatile organic compounds) emissions.

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

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

3.3.1. Radial damper: Key with circular pivoting blades on a flexible metallic cable which is 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 must be performed by a professionally certified technician, trained in ventilation system balancing.

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

5. Quality required: NAD Klima, model DAL 358
Training

DAL358
- Ceiling diffuser, square or round

SAL35
- Linear diffuser

RRA
- Duct diffuser with slots

RDD
- Duct diffuser with perforation
SAL35

- Linear diffuser
- Available with one or multiple slots
- Max length : 2 m.
- Continuous effect
- Plenum included
# Type of rollers for the diffuser

<table>
<thead>
<tr>
<th>Installation height up to 14 ft (4.3 m)</th>
<th>Installation height between 14 ft (4.3 m) to 30 ft (9 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eccentric roller</td>
<td>Roller nozzles</td>
</tr>
</tbody>
</table>

For installation height up to 4.3 m (14 ft)

For installation height 4.3 m (14 ft) to 9 m (30 ft)
Selection

Specifications:
- Height of the air duct: \( H = 3.00 \text{ m} \)
- Air flow by diffuser: \( V_0 = 384 \text{ m}^3/\text{h} \)
- Heating/Cooling mode
- Length of SAL: \( L = 1500 \text{ mm} \)

Research
1. Air flow by meter of slot section
2. Number of slots \( n \)

Solution:
1. \( 384 \text{ m}^3/\text{h} \div 1.5 = 256 \text{ m}^3/\text{h/m} \)
2. Number of slots: \( n = 3 \)

![Diagram showing air flow and slot selection]

- Air Flow by meter of slot of SAL 35 \( V_{35} \) (cfm/ft/slot)
- \( m^3/\text{h/m} / \text{slot} \)

<table>
<thead>
<tr>
<th>Air Flow by meter of slot of SAL 35 ( V_{35} )</th>
<th>( m^3/\text{h/m} / \text{slot} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling only for all ceiling heights</td>
<td>50 - 100 (10-19)</td>
</tr>
<tr>
<td>Heating and cooling or cooling only for ceiling heights ≤ 3.0 m</td>
<td>100 - 120 (19 - 22)</td>
</tr>
</tbody>
</table>
Selection

For installation height
4.3 m (14 ft) to 9 m (30 ft)

Note:
To facilitate the selection of the SAL, the total airflow must be calculated for active slot lengths of 1 m.

Specifications:
Height of the air duct: \( H = 5.00 \) m
Airflow by diffuser: \( V_0 = 770 \) m\(^3\)/h
Cooling: \( \Delta T = -15^\circ C \)
Heating: \( \Delta T = +15^\circ C \)
Length of SAL: \( L = 1500 \) mm

Research:
1- Airflow by metre of slot section
2- Number of slots \( n \) in cooling

Solution:
1. Each slot of 1500 mm = 1.5 m of length, which we divide by 1.5 to find the airflow by metre of slot: 770 m\(^3\)/h / 1.5 = 513 m\(^3\)/h/m

2. The diagram "Number of slots" and in a cooling mode we find the number of slots: \( n = 2 \).
Air flow directional control

- Maximum installation height of 10 ft (3m)
Air flow directional control

- Maximum installation height of 14 ft (4.3 m)
Air flow directional control

- Maximum installation height 30 ft (9.0 m).
End Cap

Single installation PL2:
With “L” end caps on both sides.
End Caps

Multiple installations
PLL + PLP + PLR: with “L” end caps

Connectors (pins)
The connection between diffusers is made with the aid of pins (included) when needs indicate that more than one diffuser in length is required.
Continuous Look
Simulation Graphic

- Nb of slots
- Airflow rate per meter of slots
- Vertical distance travelled by the air jet before reaching the selected air speed
- Horizontal distance travelled by the air jet
- Air jet velocity
- X critical
# Technical Specs chart

NAD Specifications SAL35

<table>
<thead>
<tr>
<th>Identification</th>
<th>Manufacturer</th>
<th>Model</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>NAD Klima</td>
<td>SAL35-2000-3</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>L2</td>
<td>NAD Klima</td>
<td>SAL35-1500-3</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>L3</td>
<td>NAD Klima</td>
<td>SAL35-2000-4</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
</tbody>
</table>

Note:

1 - *Plenum with balancing damper must be supplied by the manufacturer.*
2 - *The color of the diffuser must be selected from the RAL chart, as well the colour of the rollers from our standard colors (white, black, creme).*
3 - *Air pattern adjusted and balanced in factory according to plan*
4 - *The plenum is supplied with an inlet flange on TOP*
5 - *The plenum with a radial damper must be supplied by the manufacturer.*
6 - *The plenum with an inner acoustic insulation will be supplied by the manufacturer*
Codification on plans

DIFFUSER TAG
AIRFLOW RATE
INLET Ø
Nb of INLET
Nb of slots
AIRFLOWS PATTERN CHOSEN

<table>
<thead>
<tr>
<th>Nb of INLET</th>
<th>AIRFLOW PATTERN CHOSEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 54</td>
<td>2 DFL</td>
</tr>
<tr>
<td>Ø 150</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>DFL</td>
</tr>
</tbody>
</table>

L1 54
Ø 150 2
2 DFL
Codification on plans : line of SAL
### Codification

<table>
<thead>
<tr>
<th>Product</th>
<th>Length of diffuser</th>
<th>Number of slots</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFS</td>
<td>Standard diffuse 21 / 65</td>
<td>DVB = Divergence 21</td>
</tr>
<tr>
<td>DFL</td>
<td>Window diffuse BC / 65</td>
<td>DVD = Divergence 65</td>
</tr>
<tr>
<td>DFH</td>
<td>Diffuse height BC / DE</td>
<td>DWM = Wall divergence DE (jet towards the ceiling)</td>
</tr>
<tr>
<td>DFE</td>
<td>Diffuse window (max 4 m) BC / EF</td>
<td>DW = Vertical divergence CD</td>
</tr>
<tr>
<td>DFF</td>
<td>Diffuse AB / EF</td>
<td>DVS = Divergence 21 - 65</td>
</tr>
<tr>
<td>DFN</td>
<td>Diffuse CD / AB</td>
<td>DRB = Divergence with roller nozzles</td>
</tr>
</tbody>
</table>

### Profile and end cap

| PL2     | Wide profile with end cap in "L" shape on both sides |
| PLL     | Wide profile with end cap in "L" shape on left side |
| PLR     | Wide profile with end cap in "L" shape on right side |
| PLP     | Wide profile without an end cap (with pins) |
| PS2     | Narrow profile with flat end cap on two sides |
| PSL     | Narrow profile with flat end cap on left side |
| PSR     | Narrow profile with flat end cap on right side |
| PSP     | Narrow profile without end cap (with pull pins) |
| APA     | With a steel frontal plate * (Write the dimensions you need (in mm) in annotation) |

### Colour of rollers or nozzles

- W = White rollers or white nozzles (RAL 9003)
- C = Cream rollers or cream nozzles (RAL 9010)
- B = Black rollers or black nozzles

### Diffusers colour

- 9003 = White
- 9010 = Cream
- 0058 = Solar black (Standard matte black)
- 664M = Matte silver (Standard metallic grey)
- ___ = RAL color (indicate the number of the colour)

### Plenum

- S = Plenum with inlet on the side
- T = Plenum with inlet on the top
- X = Without plenum

### Acoustic insulation

- I = With acoustic insulation
- A = With closed cell acoustic insulation
- X = Without insulation

### Fireproof insulation

- F = With fireproof insulation and fireproof dampers
- X = Without fireproof insulation and fireproof dampers

### Balancing damper

- D = With spring damper
- R = With radial damper **
- X = Without damper

### Type of installation

- G = Gypsum ceiling
- W = Wall
- X = Suspended ceiling

### Example

| SAL 35 - 0300 - 1 - DFS - PL2 - B - 9003 - S - X - X - X |

Notes:

* For the APA model, it is essential to indicate the overall dimensions of the steel plate you need (in mm), in annotation.

** Not available on oval collar
Specification

1 - Description and physical characteristics
1.1 The high induction linear diffuser must be made of extruded aluminum profiles.

1.2. The 100 mm long eccentric rollers will have an alphanumeric identification which will permit the adjustment of the air flow pattern over 180 degrees.

The eccentric rollers and roller nozzles meet requirements of the National Building Code, Section 3.1.13.2, and certified according to the standard ASTME 162 'Surface Flammability of Materials Using a Radiant Heat Energy Source'. Eccentric rollers are available in black, cream or white.

1.3. The diffuser must be adapted to fit regular North American suspended ceilings, classic gypsum ceilings or wall installation.

1.4. The diffuser may be supplied with a wide or narrow profile.

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

2 - Performance
2.1. The diffusers' performance must be confirmed by simulation software for the critical area. This software indicates 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 should reflect a maximum air speed of 0.15 m/s (30 ft/min) in occupied zone at 1.3 m (4 ft) from the floor. The performance guarantee shall be demonstrated with performance curves showing the path of the air stream.

2.2.2 The diffuser must ensure a maximum variant in temperature difference 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 must perform at minimum of ΔTxy / ΔT0 = 0.1 (for an initial differential at ΔT0 = -10°C).

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

<table>
<thead>
<tr>
<th>Diffuser inlet size (in.)</th>
<th>Air flow maximum cfm</th>
<th>Air flow minimum cfm</th>
<th>X crit (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>80 - 150</td>
<td>20 - 40</td>
<td>1'7&quot; (0.5)</td>
</tr>
<tr>
<td>8</td>
<td>151 - 280</td>
<td>41 - 90</td>
<td>1'11&quot; (0.6)</td>
</tr>
<tr>
<td>10</td>
<td>281 - 400</td>
<td>91 - 140</td>
<td>2'3&quot; (0.7)</td>
</tr>
<tr>
<td>12</td>
<td>401 - 600</td>
<td>141 - 200</td>
<td>2'7&quot; (0.8)</td>
</tr>
</tbody>
</table>

3 - Plenum
3.1 The diffuser includes a plenum provided by the manufacturer. The plenum is made from 24 gauge galvanised steel and comprises suspension points at the four corners. The inlet collar can be centred on the side and adapted to the air flow. The interior joints of the plenum joints will be assembled by clinching and sealed with silicon.

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

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

3.2.2. Spring key: Pivotally perforated plate at the inlet adjustable with a spring mechanism through the front of the diffuser.

4 - Balancing
4.1. The balancing must be executed by a ventilation balancing technician with a recognised professional certification.

4.2. The technician must take into account the factor of correction for the volume of air using a balometer (factor FC8).

5 - Required quality: NAD Klima SAL 35 model.
Training

DAL358
- Ceiling diffuser, square or round

SAL35
- Linear diffuser

RRA
- Duct diffuser with slots

RDD
- Duct diffuser with perforation
RRA Selection

- Slotted duct diffuser
- Ideal for open ceilings
- Maximum installation height.

Eccentric rollers

Installation height between
14 ft (4,3 m) and 30 ft (9 m)

Nozzle rollers

Maximum installation
14 ft (4,3 m)
The suspension of the RRA diffuser is assured by threaded rods (3/8") provided by the installer. Upon request, colored rod covers choices by the architect, are supplied to cover the threaded rods.

Other methods of suspension are available, the aluminum suspension rail which greatly improves installation, or suspension by a high tension metallic cable. An adjustable wall support is also provided for a lateral anchor installation.

**RRA Suspension**

**Threaded rods**

**Rail**

**Cables**

**Wall mount**

*Same type of suspension for other duct diffusers (RDD)*
Blends with structure
Selection steps

1. Determine placement of ducts
2. Reducer or damper
3. Determine the Ø
4. Determine airflow per meter of slots
5. Determine the number of slots
Sample Calculation

Zone 1 : 4160 m³/h (2450 cfm)
Zone 2 : 1232 m³/h (725 cfm)
Height of underside of duct : 4 m
1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots

Example of layout

<table>
<thead>
<tr>
<th>Airflow by meter of slot of RRA $V_0$</th>
<th>Installation height of the RRA $H$</th>
<th>Recommended space between RRA $X_{MAXIMUM}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$m^3/h/m$ (cfm/l ft)</td>
<td>$m$ (ft)</td>
<td>$m$ (ft)</td>
</tr>
<tr>
<td>50 - 120 (9 - 22)</td>
<td>$\leq 3$ (10)</td>
<td>5 (16)</td>
</tr>
<tr>
<td>120 - 150 (22 - 27)</td>
<td>3 - 4.5 (10 - 15)</td>
<td>7 (22)</td>
</tr>
<tr>
<td>150 - 170 (27 - 31)</td>
<td>4.5 - 7 (15 - 23)</td>
<td>8 (26)</td>
</tr>
</tbody>
</table>

Cooling only: keep the maximum distance $X$ depending on the height, but keep the airflow by meter of the slot at 50 – 120 m$^3$/h/m.
1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots
Recommendations for direct connection

1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots
Recommendation for the connection between NAD and spiral duct

1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots

The supply duct exceed the wall an exact length of 2”1/4 (58 mm)
Optimal layout

1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots

The RRA covers entirely the zone
RRA rules

Register on last section

Reducer or damper every 25 ft : every 5 active sections

1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow
5. Determine the number of slots
Diameter selection

- Select diameter of duct
- **For airflow of less than 1400 cfm, use the following chart**

<table>
<thead>
<tr>
<th>Flow range</th>
<th>Ø recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 280 cfm</td>
<td>200 mm (8 in.)</td>
</tr>
<tr>
<td>281 cfm to 460 cfm</td>
<td>251 mm (10 in.)</td>
</tr>
<tr>
<td>461 cfm to 650 cfm</td>
<td>303 mm (12 in.)</td>
</tr>
<tr>
<td>651 cfm to 1100 cfm</td>
<td>353 mm (14 in.)</td>
</tr>
<tr>
<td>1101 cfm to 1400 cfm</td>
<td>403 mm (16 in.)</td>
</tr>
</tbody>
</table>

- **For airflow greater than 1400 cfm:** Select the diameter of the duct to obtain a maximum airspeed of 1000 cfm:

  Use the « ductulator » or the formula \( V = \frac{Q}{A} \)

  - \( V \) : air speed (fpm)
  - \( Q \) : air flow range (cfm)
  - \( A \) : surface area of duct (ft²)
Selection of Diameter

Zone 1: composed of 2 sections
  - section n° 1:
    - 4 x Ø 556 mm
  - section n° 2:
    - 4 x Ø 403 mm

Zone 2: composed of 1 section
  - 4 x Ø 353 mm
1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the air flow per meter of slots
5. Determine the number of slots

Zone 1
$4160 \frac{m^3}{h}$ (2450 cfm) for 8 active ducts. So $520 \frac{m^3}{h}$ (306 cfm) per duct

Zone 2
$1232 \frac{m^3}{h}$ (725 cfm) for 8 active ducts. So $308 \frac{m^3}{h}$ (181 cfm) per duct
An active duct typically has 1300 mm long slots.

1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the airflow per meter of slots
5. Determine the number of slots

**Zone 1**

\[
\frac{520 \text{ m}^3}{h \text{ m de fente}} = 400 \text{ m}^3/h/\text{m of slots}
\]

**Zone 2**

\[
\frac{308 \text{ m}^3}{h \text{ m de fente}} = 237 \text{ m}^3/h/\text{m of slots}
\]
1. Create a layout of the ducts
2. Reducer or damper
3. Determine the Ø
4. Determine the air flow per meter of slots
5. Determine the number of slots
Codification of RRA on plans

When a duct passes a partition (or a wall), don’t forget to use a collar.

Example of collar
## NAD Technical Spec Chart

### Tableau NAD Specifications RRA

<table>
<thead>
<tr>
<th>Identification</th>
<th>Brand</th>
<th>Model</th>
<th>Airflow</th>
<th>Ceiling height</th>
<th>Height below the duct</th>
<th>Room Temp in winter</th>
<th>Room R.H. % in winter</th>
<th>Temp in duct in winter</th>
<th>Room Temp in summer</th>
<th>Room R.H. % in summer</th>
<th>Temp in duct in summer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RRA-A</td>
<td>NAD Klima</td>
<td>RRA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RRA-B</td>
<td>NAD Klima</td>
<td>RRA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RRA-C</td>
<td>NAD Klima</td>
<td>RRA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RRA-D</td>
<td>NAD Klima</td>
<td>RRA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
</tbody>
</table>

**Notes:**

1. 3/8 threatened rod will be supplied by contractor.
2. The color of the diffuser must be selected from the RAL chart, as well the colour of the rollers from our standard colors (white, black, creme).
3. Air pattern adjusted and balanced in factory according to plan.
4. The aluminium suspension rails will be painted the RAL color chosen and supplied by the manufacturer.
5. The rod covers will be painted the RAL color chosen and supplied by the manufacturer.
6. The ducts will be acoustically insulated by the manufacturer.
7. Starter flange included.
Simulation graphics

- Number of slots
- Airflow rate per of slots
- Vertical distance travelled by the air jet before reaching the selected air speed
- Horizontal distance travelled by the air jet
- Vertical penetration of air jet
- Air jet velocity
- Temperature differential in cooling
Codification

**Codification for DRA**

<table>
<thead>
<tr>
<th>Product</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lg</td>
<td>Length of duct Lg</td>
</tr>
<tr>
<td>Ls</td>
<td>Length of slots Ls</td>
</tr>
<tr>
<td>D</td>
<td>Duct diameter</td>
</tr>
<tr>
<td>Q</td>
<td>Quantity of slots</td>
</tr>
<tr>
<td>St</td>
<td>Slots position</td>
</tr>
<tr>
<td>A</td>
<td>Air flow</td>
</tr>
<tr>
<td>R</td>
<td>Rollers and roller nozzles</td>
</tr>
<tr>
<td>C</td>
<td>Color</td>
</tr>
<tr>
<td>D</td>
<td>Diffuser color</td>
</tr>
<tr>
<td>Dc</td>
<td>Acoustic insulation</td>
</tr>
<tr>
<td>A</td>
<td>Acoustic insulation</td>
</tr>
<tr>
<td>B</td>
<td>Balancing damper</td>
</tr>
<tr>
<td>R</td>
<td>Register</td>
</tr>
</tbody>
</table>

**Codification for reducers**

<table>
<thead>
<tr>
<th>Product</th>
<th>Product Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø D</td>
<td>Inlet diameter</td>
</tr>
<tr>
<td>Ø A</td>
<td>Outlet diameter</td>
</tr>
<tr>
<td>C</td>
<td>Configuration</td>
</tr>
<tr>
<td>L</td>
<td>Length</td>
</tr>
<tr>
<td>R</td>
<td>Color</td>
</tr>
<tr>
<td>A</td>
<td>Acoustic insulation</td>
</tr>
<tr>
<td>X</td>
<td>Acoustic insulation</td>
</tr>
</tbody>
</table>

**Example**

- **DRA - 1100 - 1200 - 303 - 1 - 06L - DEK - W - 003 - X - 3**
- **Example**
Specifications

1. **Description and physical characteristics**
   1.1 The high induction duct diffuser will be made of 22 ga brushed steel for duct inferior to 508 mm in diameter, and 20 ga for diameter superior or equal to 508 mm.
   
   1.2 The circular duct diffuser will be available in diameter ranging from 203 mm to 1419 mm. The duct diffuser will be equipped at each end with a groove with a gasket made of EPDM to ensure a tight seal between sections. The sections will be assembled using union sleeves.
   
   1.3 Steel reinforcements will have to be installed inside ducts of more than 433 mm (17 inches) in diameter in order to maintain its shape.
   
   1.4 The duct diffuser will be painted with a TGIC free polyester powder coat. It will have a smooth surface for easy cleaning. The colour will be chosen by the architect or the customer. The paint of the diffuser must be guaranteed against peeling for a minimum period of 5 years.
   
   1.5 The conduit diffuser will be supplied with slots containing ABS (black, cream or white) eccentric rollers and / or nozzle rollers. The 100 mm long eccentric rollers will be alphanumerically identified allowing for the adjustment of the air flow pattern over 180 degrees.

   The eccentric and nozzle rollers will respect the National Building Code, article 3.1.13.2, and will be certified according to norm ASTM E 162 + Surface flammability of materials using a radiant heat energy source.
   
   1.6 A reducer fitting or perforated balancing damper with a self locking mechanism allowing for an output between 10% and 100%, must be installed after a maximum of 5 consecutive active sections of the same diameter. A Slot register will be integrated to the last active section of the system.
   
   1.7 The union sleeves will not exceed the dimensions of the duct by 3 mm, and will be rounded to facilitate cleaning. The duct will have as smooth as possible surface to maintain an architectural appearance.
   
   1.8 The duct diffuser can be passive, without slots.

2. **Installation and suspension**
   
   2.1 The suspension of the duct will be done with threaded rods (3/8") supplied by the installer.
   
   2.2 The threaded rods can be covered with rod covers supplied by the manufacturer of the diffuser. The colour of the rod covers according to the RAL colour chart will be chosen by the architect or the customer.
   
   2.3 When required, the suspension of the duct diffuser will be available in three options.
   
   2.3.1 Rail suspension
   The duct diffuser could be slid into an aluminium rail suspended, offering a solution for varied types of ceiling. The rail can be painted according to the RAL colour chart and chosen by architect or customer.
   
   2.3.2 Suspension by metallic cable
   The duct diffuser can be suspended by metallic cable (aviation style) 7 X 7 or 7 X 9 of galvanised or stainless steel (304 or 316) of medium or high traction resistance.

   2.3.3 Well suspension
   The duct diffuser can be anchored laterally with an adjustable wall support in the same colour as the duct diffuser. This wall support will be supplied by the manufacturer of the diffuser.
   
   2.4 When the duct diffuser goes through a wall, a collar adapted to the duct diffuser shall be supplied by the manufacturer.
   
   2.5 The standard accessories shall have the same finish as the duct diffuser (elbows, sleeves, reducers, branches, etc.)
   
   2.6 Each conduit diffuser will be identified with a label. This label will contain the section number, the direction of the air flow, the number of slots and the positioning of the eccentric rollers.

3. **Performances**
   The manufacturer shall demonstrate for approval:
   
   3.1 A diagram of the air flow, illustrating the trajectory of the air jets.
   
   3.2 The pressure loss generated by the system and duct diffusers supplied by the manufacturer.

   The pressure loss generated by the entire network

4. **Adjustment**
   
   4.1 The adjusting of the eccentric rollers will be done by the manufacturer according to the required output.
   
   4.2 The adjustment of the eccentric rollers will be possible even after the installation of the diffuser in order to meet new output requirements.

5. **Balancing**
   
   5.1 The balancing of the diffusers shall be done by a ventilation balancing technician, accredited as a qualified professional.

   5.2 When required, the technician will refer to the eccentric roller adjustment mode available in the manufacturers’ reference manual.

6. **Required quality**: NAD Klima model RRA
Training

- **DAL358**
  - Ceiling diffuser, square or round

- **SAL35**
  - Linear diffuser

- **RRA**
  - Duct diffuser with slots

- **RDD**
  - Duct diffuser with perforation
RDD

- Perforated duct diffuser
- Perforation adapted to the configuration of the room
- Ideal for open ceiling applications
- Maximum installation height 60ft (18 m)
- Minimum installation height 13ft (4.0 m)
Adaptive perforations

Height of the room  Diffusion mode

\[ H > 5 \text{ m (16 ft)} \]

\[ H < 5 \text{ m (16 ft)} \]
Large scale results
Selection steps

1. Determine location of ducts
2. Determine the Ø Diameter
3. Balance the air flow
4. Provide construction drawings
Sample of calculation

Zone 1: 4160 m³/h (2450 cfm)
Zone 2: 1232 m³/h (725 cfm)
Height of underside duct: 13ft (4 m)
1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow

**Example of layout**

<table>
<thead>
<tr>
<th>Height of the installation of RDD H</th>
<th>Recommended spacing between RDD X MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>m (ft)</td>
<td>m (ft)</td>
</tr>
<tr>
<td>≤ 6 (20)</td>
<td>6 (20)</td>
</tr>
<tr>
<td>6 - 10 (20-30)</td>
<td>10 (30)</td>
</tr>
<tr>
<td>10-15 (30 - 50)</td>
<td>12 (40)</td>
</tr>
</tbody>
</table>
Recommendations for direct connection

1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow
1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow

Recommendation for the connection between NAD and spiral duct

The supply duct exceed the wall an exact length of 2”1/4 (58 mm)
Optimal layout

1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow

The RDD covers the entire zone
Selection of diameter

- Select diameter of duct
- For airflow of less than 1400 cfm, use the following chart

<table>
<thead>
<tr>
<th>Flow range</th>
<th>Ø recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 280 cfm</td>
<td>200 mm (8 in.)</td>
</tr>
<tr>
<td>281 cfm to 460 cfm</td>
<td>251 mm (10 in.)</td>
</tr>
<tr>
<td>461 cfm to 650 cfm</td>
<td>303 mm (12 in.)</td>
</tr>
<tr>
<td>651 cfm to 1100 cfm</td>
<td>353 mm (14 in.)</td>
</tr>
<tr>
<td>1101 cfm to 1400 cfm</td>
<td>403 mm (16 in.)</td>
</tr>
</tbody>
</table>

- For airflow greater than 1400 cfm:
  Select the diameter of the duct to obtain a maximum airspeed of 1000 cfm:
  Use the « ductulator » or the formula

\[ V = \frac{Q}{A} \]

V : air speed (fpm)
Q : air flow range (cfm)
A : surface area of duct (ft²)
Diameter selection

1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow

Zone 1: Composed of 2 sections
Section n° 1:
- 4 x Ø 556 mm
Zone 2: Composed of 1 section
- 4 x Ø 353 mm
1. Determine placement of ducts
2. Determine the Ø
3. Balance air flow

RDD Rules

Install 1 Reducer or Damper every 50 ft or every 10 active sections
# NAD Spec Chart

Tableau NAD Specifications RDD

<table>
<thead>
<tr>
<th>Identification</th>
<th>Brand</th>
<th>Model</th>
<th>Airflow</th>
<th>Ceiling height</th>
<th>Height below the duct</th>
<th>Room Temp in winter</th>
<th>Room R.H. % in winter</th>
<th>Temp in duct in winter</th>
<th>Room Temp in summer</th>
<th>Room R.H. % in summer</th>
<th>Temp in duct in summer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDD-A</td>
<td>NAD Klima</td>
<td>RDD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RDD-B</td>
<td>NAD Klima</td>
<td>RDD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RDD-C</td>
<td>NAD Klima</td>
<td>RDD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
<tr>
<td>RDD-D</td>
<td>NAD Klima</td>
<td>RDD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, 3, 4, 5, 6, 7</td>
</tr>
</tbody>
</table>

**Note:**

1 – 3/8 threatened rod will be supplied by contractor.
2 – The color of the diffuser must be selected from the RAL chart
3 – The diffusers perforations are made with a software to meet the performance needs
4 – The aluminium suspension rails will be painted the RAL color chosen and supplied by the manufacturer.
5 – The rod covers will be painted the RAL color chosen and supplied by the manufacturer.
6 – The ducts will be acoustically insolated by the manufacturer.
7 – Starter flange included
Codification of RDD on plans

TAG DIFFUSER

Air flow

Ø of the duct

<table>
<thead>
<tr>
<th>RDD-A</th>
<th>85 l/s per section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 400</td>
<td>1500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A-Ø550</th>
<th>85 l/s per section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 500</td>
<td>1500</td>
</tr>
</tbody>
</table>
# Codification

**Codification of RDD duct diffusers**

<table>
<thead>
<tr>
<th>RDD</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000, 1500, 1800</td>
<td>Length Lg</td>
</tr>
<tr>
<td>200, 251, 302, 353, 404, 455, 505, 555, 607, 657, 708, 759, 810, 861, 911, 962, 1013, 1064, 1115, 1165, 1216, 1267, 1318, 1369, 1419</td>
<td>Duct diameter</td>
</tr>
</tbody>
</table>

| A | Active (with perforation) |
| X | Passive (without perforation) |

- **9003** = White
- **9010** = Cream
- **0008** = Solar black (Standard matte black)
- **005M** = Silver mat (Standard metallic-grey)

<table>
<thead>
<tr>
<th></th>
<th>Perforation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>With closed-cell insulation</td>
</tr>
<tr>
<td>X</td>
<td>Without insulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Diffuser Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>With damper</td>
</tr>
<tr>
<td>X</td>
<td>Without damper</td>
</tr>
</tbody>
</table>

- **Example**
  - RDD - 1500 - 200 - A - 9003 - X - X

**Codification for reducers**

<table>
<thead>
<tr>
<th>RDD</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 96, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372, 1422</td>
<td>Ø D - Input diameter</td>
</tr>
<tr>
<td>203, 254, 305, 356, 406, 457, 508, 559, 610, 660, 711, 762, 813, 864, 914, 965, 96, 1016, 1067, 1118, 1168, 1219, 1270, 1321, 1372</td>
<td>Ø d - Output diameter</td>
</tr>
</tbody>
</table>

| T | Flat on Top (standard) |
| C | Centered |
| B | Flat on Bottom |

- **S** = Standard α = 44°
- **A** = Other (specify in annotation)

<table>
<thead>
<tr>
<th></th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>9003</td>
<td>White, 9010 = Cream</td>
</tr>
<tr>
<td>0008</td>
<td>Solar black (Standard matte black)</td>
</tr>
<tr>
<td>005M</td>
<td>Silver Mat (Standard metallic-grey)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>With closed-cell insulation</td>
</tr>
<tr>
<td>X</td>
<td>Without insulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Insulation</th>
</tr>
</thead>
</table>

**Notes:**

- Our thermo lacqued paint are available in the RAL chart colors. Metallic colors are available upon request only.
Specification

1. Description and physical characteristics

1.1 The high induction duct diffuser will be made of 22 ga brushed steel for duct inferior to 508 mm in diameter, and 20 ga for diameter superior or equal to 508mm.

1.2 The circular duct diffuser will be available in diameter ranging from 202 mm to 1419 mm. The duct diffuser will be equipped at each end with a groove with a gasket made of EPDM to ensure a tight seal between sections. The sections will be assembled using union sleeves.

1.3 Steel reinforcements will be have to be installed inside ducts of more than 433 mm (17 inches) in diameter in order to maintain it's shape.

1.4 The duct diffuser will be painted with a TGIC free polyester powder coat. It will have a smooth surface for easy cleaning. The colour will be chosen by the architect or the customer. The paint of the diffuser must be guaranteed against peeling for a minimum period of 5 years.

1.5 The pattern for the holes will be determine with the help of a computer program.

1.6 The holes will be made with a laser cutter and burr free.

1.7 When required, the duct diffuser will be equipped with balancing perforated damper with a self blocking mechanism allowing for air output of between 10% to 100%.

1.8 The union sleeves will not exceed the dimensions of the duct by 3 mm, and will be rounded to facilitate cleaning. The duct will have as smooth as possible surface to maintain an architectural appearance.

1.9 The duct diffuser can be passive, without holes.

2. Installation and suspension

2.1 The suspension of the duct will be done with threaded rods (3/8") supplied by the installer.

2.2 The threaded rods can be covered with rod covers supplied by the manufacturer of the diffuser. The colour of the rod covers according to the RAL colour chart will be chosen by the architect or the customer.

2.3 When required, the suspension of the duct diffuser will be available in three options.

2.3.1 Rail suspension
- The duct diffuser could be slid into an aluminium rail suspended, offering a solution for varied types of ceiling. The rail can be painted according to the RAL colour chart and chosen by architect or customer.

2.3.2 Suspension by metallic cable
- The duct diffuser can be suspended by metallic cable (aviation style) 7 X 7 or 7 X 9 of galvanised or stainless steel (304 or 316) of medium or high traction resistance.

2.3.3 Wall suspension
- The duct diffuser can be anchored laterally with an adjustable wall support in the same colour as the duct diffuser. This wall support will be supplied by the manufacturer of the diffuser.

2.4 When the duct diffuser goes through a wall, a collar adapted to the duct diffuser shall be supplied by the manufacturer.

2.5 The standard accessories shall have the same finish as the duct diffuser (elbows, sleeves, reducers, branches, etc.)

3. Performances

The manufacturer shall demonstrate for approval:

3.1 A diagram of the air flow, illustrating the trajectory of the air jets.

3.2 The pressure loss generated by the system and duct diffusers supplied by the manufacturer.

The pressure loss generated by the entire network.

4. Balancing

4.1 The balancing of the diffusers shall be done by a ventilation balancing technician, accredited as a qualified professional.

5. Required quality: NAD Klima model RDD.
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