SELECTION PROCEDURE

A 630mm axial flow fan (AP Series) running at 24 rev/sec, Type D installation (fully ducted) to give a duty of 3.5m³/s at 180 Pa static pressure.

1. Air flow 3.5m³/s
2. Static pressure is 180 Pa; no correction is required as the curves are plotted for Type D installation.
3. Blade angle setting = 25° Full impeller code = 0634/10/25°
4. Fan impeller power, \( P_i = 1.33 \) kW
   Recommended motor power = 1.5 kW
   Motor frame size is D90L
   See pages J-2/3 for details of these motors.
5. Fan total efficiency
   \[ \frac{q_v \times p_t \text{F}}{10P_i} = \frac{3.5 \times (180 + 75)}{10 \times 1.33} = 67.1\% \]
   where:
   \( q_v = \) volume flow, m³/s
   \( p_t \text{F} = \) fan total pressure, Pa
   \[ p_t \text{F} = p_s \text{F} + p_d \text{F} \]
   \( P_i = \) fan impeller power, kW
6. Outlet side in-duct sound power level, \( L_W = 90\) dB (by interpolation)
7. Relevant sound zone 5
8. From the sound data table using zone 5 inlet side in-duct data
   Total sound power level correction value for fan inlet = 0dB
   Hence total sound power, \( L_W = 90\) dB
9. Octave band spectra correction values

<table>
<thead>
<tr>
<th>Hz</th>
<th>63</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1k</th>
<th>2k</th>
<th>4k</th>
<th>8k</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_W ) dB</td>
<td>6</td>
<td>15</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

*Correction values are negative unless shown otherwise and are subtracted from the Total Sound Power.

Correction value to Sound Pressure at 3m is 21dB; (see Ref. i and Fig. 7 on Page G-27) therefore:
Total sound pressure level \( L_P \) at 3m = 90 - 21 = 69 dB.

Octave band spectra correction values as for step 10 at 3m:

<table>
<thead>
<tr>
<th>Hz</th>
<th>63</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1k</th>
<th>2k</th>
<th>4k</th>
<th>8k</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_P ) dB</td>
<td>63</td>
<td>55</td>
<td>61</td>
<td>60</td>
<td>62</td>
<td>59</td>
<td>58</td>
<td>50</td>
</tr>
</tbody>
</table>

11. Correction value from dB at 3m to dB(A) at 3m = -3
   Total dB(A) level at 3m = 69 - 3 = 66dB A. Similar sound data could have been deduced for the outlet side in-duct or inlet and outlet free field levels from the data shown in the Sound Data table.

12. If a selection for the same fan and duty had been required for a Type A installation, then the static pressure would have to be corrected as follows.
   Relative pressure loss = +35 Pa

13. Revised static pressure for curve selection purposes
   = 180 + 35
   = 215 Pa.

This would result in a fan selection at 27°, an impeller power of 1.54kW, an outlet side in-duct total noise level of 91dB and the duty point moving into zone 2.