

# ISO 5802:2001-07 (E)

## Industrial fans - Performance testing in situ

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Terms, definitions and symbols .....</b>	<b>1</b>
<b>3.1</b>	<b>Terms and definitions .....</b>	<b>1</b>
<b>3.2</b>	<b>Symbols .....</b>	<b>14</b>
<b>4</b>	<b>Quantities to be measured .....</b>	<b>18</b>
<b>5</b>	<b>General conditions and procedures concerning in situ tests .....</b>	<b>18</b>
<b>5.1</b>	<b>General recommendations .....</b>	<b>18</b>
<b>5.2</b>	<b>Selection of test point when only the system resistance can be varied .....</b>	<b>18</b>
<b>5.3</b>	<b>Fans fitted with adjustment devices .....</b>	<b>19</b>
<b>5.4</b>	<b>System throttling devices allowing the system resistance to be altered .....</b>	<b>19</b>
<b>5.5</b>	<b>Selection of the test point when the system resistance cannot be varied .....</b>	<b>19</b>
<b>5.6</b>	<b>When correction of the coefficient deduced from the test is not necessary .....</b>	<b>20</b>
<b>6</b>	<b>Instrumentation .....</b>	<b>20</b>
<b>6.1</b>	<b>Instrumentation for measurement of pressure .....</b>	<b>20</b>
<b>6.2</b>	<b>Measurement of air velocity .....</b>	<b>21</b>
<b>6.3</b>	<b>Measurement of temperature .....</b>	<b>23</b>
<b>6.4</b>	<b>Determination of density .....</b>	<b>24</b>
<b>6.5</b>	<b>Measurement of rotational speed .....</b>	<b>25</b>
<b>7</b>	<b>Determination of fan pressure .....</b>	<b>25</b>
<b>7.1</b>	<b>Location of pressure measurement plane .....</b>	<b>25</b>
<b>7.2</b>	<b>Measurement of fan pressure .....</b>	<b>27</b>
<b>8</b>	<b>Determination of flow rate .....</b>	<b>36</b>
<b>8.1</b>	<b>Choice of measuring method .....</b>	<b>36</b>
<b>8.2</b>	<b>Choice of measuring section .....</b>	<b>36</b>
<b>8.3</b>	<b>Determination of flowrate using differential pressure devices .....</b>	<b>38</b>
<b>8.4</b>	<b>Determination of flowrate by velocity area methods .....</b>	<b>38</b>
<b>9</b>	<b>Determination of power .....</b>	<b>54</b>
<b>9.1</b>	<b>Definition of performance characteristics relating to the power of a fan .....</b>	<b>54</b>
<b>9.2</b>	<b>Losses during transmission of power from the motor to the impeller .....</b>	<b>56</b>
<b>9.3</b>	<b>Methods for determination of power .....</b>	<b>56</b>
<b>9.4</b>	<b>Measuring instruments .....</b>	<b>59</b>
<b>9.5</b>	<b>Precautions to be taken during in situ tests .....</b>	<b>59</b>
<b>10</b>	<b>Uncertainty associated with the determination of fan performance .....</b>	<b>59</b>
<b>10.1</b>	<b>General .....</b>	<b>59</b>
<b>10.2</b>	<b>Performance errors .....</b>	<b>60</b>
<b>10.3</b>	<b>Uncertainty of measurement .....</b>	<b>60</b>
<b>10.4</b>	<b>Specified uncertainties .....</b>	<b>60</b>
<b>10.5</b>	<b>Analysis of uncertainty .....</b>	<b>60</b>

<b>Annex A (normative) Position of exploration lines for a marginal wall profile compatible with a general power law .....</b>	<b>67</b>
<b>Annex B (normative) Determination of the position of the marginal exploration lines in cases not covered by annex A .....</b>	<b>71</b>
<b>Annex C (normative) Minimum straight lengths required upstream and downstream of the differential pressure devices (DP device) used for flow measurement .....</b>	<b>74</b>
<b>Annex D (normative) Loss allowance for straight, smooth ducts and standardized airways .....</b>	<b>82</b>
<b>Annex E (normative) Rotating vane anemometer calibration .....</b>	<b>84</b>
<b>Bibliography .....</b>	<b>86</b>