ICS 27.010

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NATIONAL STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

GB 28381–2012

Minimum allowable values of energy efficiency and evaluating values of energy conservation for centrifugal blower

Issued on: May 11, 2012 **Implemented on: September 01, 2012**

Issued by: **General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;**

Standardization Administration of the People's Republic of China

Table of Contents

Foreword

For the purpose of this standard, subclause 5.3 is normative and the other clauses/subclauses are informative.

This standard is drafted in accordance with the rules of GB/T 1.1 – 2009.

This standard was proposed by the Department of Resource Conservation and Environment Protection of the National Development and Reform Commission.

This standard is under the jurisdiction of National Technical Committee of Energy Fundamentals and Management of Standardization Administration of China (SAC/TC 20).

Drafting organizations of this standard include Shenyang Blowers (Group) Co., Ltd, China National Institute of Standardization, Shaanxi Blowers (Group) Co., Ltd, Chongqing General Industry (Group) Co., Ltd, Nantong Dart-Pollrich Fan Co., Ltd, Shandong *Z*hangqiu Blower Co., Ltd, *Z*hejiang Shangfeng Industrial Holding Ltd, and Jiangsu Jintongling Fan Co., Ltd.

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Minimum allowable values of energy efficiency and evaluating values of energy conservation for centrifugal blower

1 Scope

This standard specifies the minimum allowable values of energy efficiency, evaluating values of energy conservation, and test methods for centrifugal blowers.

This standard applies to single-stage dual-support low-speed centrifugal blowers; multi-stage low-speed centrifugal blowers; single-stage dual-support high-speed centrifugal blowers (including single-side impeller of dual-inlet blower); and multi-stage high-speed centrifugal blowers.

2 Normative references

The following normative documents are indispensable for application of this standard. For dated normative documents, only the edition dated with the day applies to this standard. For undated normative documents, the latest edition (including all amendments) applies to this standard.

JB/T 2977 Technical terms for industry fans, turbo-blowers and compressors

JB/T 3165 Thermodynamic performance test for centrifugal & axial blower and compressor

JB/T 7258 Centrifugal blower for general purpose

3 Terms and definitions

The following definitions apply to this standard, in addition to those defined in JB/T 3165 and in JB/T 2977.

3.1

Minimum allowable values of energy efficiency for centrifugal blower

The minimum guaranteed allowable values of variable efficiency for centrifugal blower, under the specified standard conditions of testing.

3.2

Evaluating values of energy conservation for centrifugal blower

the minimum guaranteed allowable values of variable efficiency which shall be achieved with respect to energy conservation for centrifugal blower, under the specified standard conditions of testing.

4 Classification of products

By the number of stages, structure and number of revolutions, a centrifugal blower may be classifed as single-stage cantilever-fitted low-speed centrifugal blower; single-stage dual-support low-speed centrifugal blower; multi-stage low-speed centrifugal blower; single-stage cantilever-fitted high-speed centrifugal blower; single-stage dual-support high-speed centrifugal blower; and multi-stage high-speed centrifugal blower etc.

5 Technical requirements

5.1 Basic requirements

Product design, manufacturing and quality of centrifugal blower shall comply with provisions of JB/T 7258.

5.2 The variable efficiency of centrifugal blower shall be calculated according to the following equation:

$$\eta_{\text{pol}} = \frac{W_{pol}}{W_{tot}} \times 100\% = \frac{m/(m-1)}{k/(k-1)} \times 100\% = \frac{1}{k/(k=1)} \times \frac{\lg(P_2/P_1)}{\lg(T_2/T_1)} \times 100\% \quad \text{..... (1)}$$

Where:

η_{pol} is the polytropic efficiency of the centrifugal blower;

Table 6 Evaluating values of energy conservation for multi – stage low – speed centrifugal blowers

b_2/D_2	Number of stages Z	The highest polytropic efficiency of the centrifugal blower within the operating range, η_{pol}, %				
		Impeller diameter, D_2, in mm				
		Less than 300	301 to 400	401 to 600	601 to 800	More than 801
Less than 0.020	2 to 3	54.5	56.0	57.0	58.5	57.5
	4 to 6	54.0	55.5	56.5	58.0	57.0
0.021 to 0.030	2-3	68.5	71.5	72.0	73.5	74.0
	4 to 6	68.0	71.0	71.5	73.0	73.5
0.031 to 0.040	2 to 3	70.5	73.0	73.5	74.5	75.5
	4 to 6	70.0	72.5	73.0	74.0	75.0
0.041 to 0.050	2 to 3	73.0	74.0	74.5	75.5	76.5
	4 to 6	72.5	73.5	74.0	75.0	76.0

References and Original Chinese Documents

[1] GB 28381-2012 The centrifugal blower energy efficiency limited value and evaluating values of energy.
http://www.chinesestandard.net/Default.aspx?PDF-English-ID=GB%2028381-2012

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