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Technical specification for energy saving in wheat flour mills

小麦制粉企业节能技术规范

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the National Food and Strategic Reserves Administration. This document is under the jurisdiction of the National Technical Committee on Standardization of Grain and Oil (SAC/TC270). This document was drafted by: Henan University of Technology, Wuxi COFCO Engineering Technology Co., Ltd., and Zhengzhou Gedegru Mechanical Engineering Co., Ltd. Guangzhou Lingnan Suiliang Grain Co., Ltd., Hebei Pingle Grain Science & Technology Intelligent Equipment Co., Ltd., and Shandong Guanxian Xinhengxiang Flour Industry Co., Ltd. Company, Zhengzhou University of Science and Technology. The main drafters of this document are. Wu Wenbin, Wen Jiping, Liu Shaoguang, Li Mingzhe, Liu Zili, Gao Peng, Fan Zhengang, Liu Zhijin, and Ren Chuanshun. Jia Huapo, Hao Yongxing, Wang Xuefeng, Xin Peifang, Zhang Shaohua, Guo Hongmin, Liu Yifan. Energy-saving technical specifications for wheat milling enterprises

1. Scope This document defines the terminology and definitions of energy-saving technologies for wheat milling enterprises, and stipulates the basic requirements, measures, and management of energy-saving technologies. Requirements such as reasoning. This document applies to the application and management of energy-saving

technologies in wheat milling workshops.

4 Basic requirements for energy conservation

4.1 Production equipment and lighting fixtures with high energy efficiency ratings should be purchased, and high-energy-consuming equipment that is explicitly eliminated by the state should not be used.

4.2 Material flows with the same or similar properties should be merged, provided that process and safety requirements are met.

4.3 Redundant and non-value-adding processing steps and intermediate conveying processes should be identified, eliminated, or merged to effectively shorten the main conveying distance of materials.

4.4 The motor operating load rate of all equipment should be maintained between 50% and 100%.

5.1 General Energy-Saving Measures

5.1.1 High-efficiency motors should be used.

5.1.2 High-energy-consuming equipment of 15kW and above should be equipped with variable frequency speed control devices.

5.1.3 Optimize the automatic start-up and shutdown sequence and time of the production line to reduce non-productive performance consumption.

5.1.4 Optimize fault handling methods to reduce energy consumption caused by frequent start-stop operations due to faults.

5.1.5 The equipment should be tested for energy efficiency regularly and aged parts should be replaced in a timely manner.

5.2 Energy-saving measures for the cleaning process

5.2.1 The cleaning process should be optimized, equipment should be configured reasonably, and over-cleaning should be avoided.

5.2.2 It is advisable to adopt a suitable water-moistening process and select low-energy water-sprinkling equipment.

5.3 Energy-saving measures for the powder making process

5.3.1 Optimize wheat milling process and set up an appropriate grinding and sieving system.

5.3.2 Under the premise of ensuring the quality of wheat flour, the grinding roller

parameters should be optimized, and the mill motor should be configured in accordance with the relevant requirements of GB 18613.

5.3.3 Establish reasonable operating parameters for the grinding mill to avoid over-grinding.

5.3.4 If the grinding effect decreases and the power consumption increases, the surface of the grinding roller should be re-drawn or sandblasted in a timely manner.

5.3.5 Optimize the configuration of the flat screen to improve screening efficiency.

5.3.6 Optimize the air volume of the cleaning machine; the fan power should be configured according to the relevant requirements of GB/T 13470.

5.3.7 The purifier and the core milling system should be linked, and the core should be extracted first to reduce the number of subsequent grinding cycles.

5.4 Energy-saving measures for powder preparation and packaging processes

5.4.1 Set up a flexible powder mixing process to reduce material conveying links.

5.4.2 Pest control facilities should be used as needed.

5.4.3 Simplify the packaging and warehousing process; online distribution or loose powder distribution is recommended.

5.5 Energy-saving measures for conveying and dust removal

5.5.1 Equipment layout should be optimized to reduce conveying equipment and conveying distance.

5.5.2 Energy-saving mechanical conveying equipment should be given priority, and belt conveyors are recommended for long-distance conveying.

5.5.3 The motor power of the conveyor equipment shall be configured in accordance with the relevant requirements of GB/T 12497.

5.5.4 Mechanical transportation should be given priority for raw grains.

5.5.5 Optimize pneumatic conveying parameters and improve the solid-to-gas ratio. The fan power should be configured according to the relevant requirements of GB 19761 and GB/T 13470, and equipped with... Equipped with a variable frequency control system.

5.5.6 A cone-bottom pulse dust collector should be used, and a differential pressure sensing pulse jet system should be configured.

5.5.7 Optimize the selection and design of air network duct fittings. Local fittings in the dust removal air network, such as tees, elbows, butterfly valves, reducers, and deformable parts, should meet the following requirements. Under the premise of dust control requirements, the changes in pipe fitting boundaries should be gradual, and the contraction or expansion

of the flow cross section should not be too large to reduce local resistance.

5.5.8 The ventilation network configuration and operation should be balanced for flow, and the material feeding system should not leak air throughout the entire process.

5.5.9 For air networks with multiple air intake points, the air dampers at the stopped air intake points should be closed in a timely manner.

5.5.10 The ventilation ducts and dust collectors should be cleaned regularly.

5.6 Electrical Energy Saving Measures

5.6.1 Transformers and low-voltage distribution cabinets should be located close to the motor control center, and a distributed motor control center should be adopted.

5.6.2 Power cables for electrical equipment shall comply with GB/T 12706.2.

5.7 Intelligent control and energy-saving measures

5.7.1 Optimize production scheduling, set up an energy management system, and preferably configure a data acquisition and monitoring system covering the three levels of energy from raw materials to equipment to production processes. Energy consumption data is collected and monitored in real time, with a focus on monitoring the energy consumption curves of high-energy-consuming equipment and the overall energy consumption of each process.

5.7.2 Artificial intelligence algorithms should be used to predict equipment failures to reduce energy consumption losses during downtime maintenance.

5.7.3 It is advisable to introduce an online monitoring instrument to adjust the milling process parameters in real time.

6 Enterprise Energy Conservation Management

6.1 Enterprises should establish energy conservation systems in accordance with the requirements of GB/T 23331.

6.2 Energy metering instruments shall be configured in accordance with the requirements of GB 17167, and energy saving and energy saving rate shall be calculated in accordance with the method specified in GB/T 13234.

6.3 It is advisable to establish and improve energy consumption statistical analysis and assessment indicators, and to establish a document archive of energy consumption calculation and assessment results.

6.4 The comprehensive energy consumption index per unit product for each production process shall be formulated in accordance with the provisions of GB/T 12723.