

ICS 27.010
CCS F 01



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 30528-2014

**The norm of energy consumption per unit products of polyvinyl
alcohol**

聚乙烯醇单位产品能源消耗限额

Issued on: April 28, 2014

Implemented on: January 1, 2015

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1	Scope
2	Normative references
3	Terms and definitions
4	Technical requirements
4.1	Limiting value of energy consumption per unit product of polyvinyl alcohol
4.2	Access value of energy consumption per unit product of polyvinyl alcohol
4.3	Advanced value of energy consumption per unit product of polyvinyl alcohol
5	Statistical scope and calculation method
5.1	Statistical scope
5.2	Calculation method
6	Energy-saving management and measures
6.1	Basic energy-saving management
6.2	Energy-saving technical management
6.2.1	Economical operation
6.2.2	Energy-saving technical measures
6.2.3	Management of energy-consuming equipment

1 Scope

This standard fixes the technical requirements, the statistical scope and calculation method and the energy-saving management and measures for the energy consumption quota per unit product of polyvinyl alcohol produced by the acetylene method and by the ethylene method (energy consumption for short).

It applies to the calculation and the assessment of the energy consumption per unit product of enterprises producing polyvinyl alcohol by the acetylene method and by the ethylene method, and to the control of energy consumption of newly built projects.

2 Normative references

The following documents are indispensable for the application of this document. For dated references only the edition cited applies; for undated references the latest edition, all amendments included, applies.

GB/T 2589 General principles for calculation of the comprehensive energy consumption.

GB/T 12010.3-2010 Plastics - Polyvinyl alcohol materials (PVAL) - Part 3: Specifications.

GB/T 12497 Economical operation of three-phase asynchronous motors.

GB/T 12723 General principles for preparation of the norm of energy consumption per unit product.

GB/T 13462 Economical operation of power transformers.

GB/T 13466 General principles for economical operation of alternating current electric drive fan (pump, air compressor) systems.

GB/T 15587 Guidelines for energy management of industrial enterprises.

GB 17167 General principles for equipping and managing the measuring instrumentation of energy in an energy-using organisation.

GB 18613 Minimum allowable values of energy efficiency and energy efficiency grades for small and medium three-phase asynchronous motors.

GB 19153 Minimum allowable values of energy efficiency and energy efficiency grades for displacement air compressors.

GB 19761 Minimum allowable values of energy efficiency and energy efficiency grades for ventilators.

GB 19762 Minimum allowable values of energy efficiency and evaluating values of energy conservation for clean water centrifugal pumps.

GB 20052 Minimum allowable values of energy efficiency and energy efficiency grades for three-phase distribution transformers.

3 Terms and definitions

The terms and definitions given in GB/T 12723 and the following apply to this document.

3.1 the comprehensive energy consumption of polyvinyl alcohol. The total quantity of the various forms of energy actually consumed in production, during the reporting period, over the whole production process of the polyvinyl alcohol product.

3.2 the comprehensive energy consumption per unit products of polyvinyl alcohol. The comprehensive energy consumption of the polyvinyl alcohol product expressed per unit of output.

3.3 the production process of acetylene method. The process route in which acetylene obtained by hydrolysis of calcium carbide or by cracking of natural gas is used as raw material and the polyvinyl alcohol product is obtained through the synthesis section, the rectification section, the polymerisation section, the alcoholysis section and the recovery section.

3.4 the production process of ethylene method. The process route in which ethylene obtained by cracking of petroleum or by dehydration of biomass ethanol is used as raw material and the polyvinyl alcohol product is obtained through the synthesis section, the rectification section, the polymerisation section, the alcoholysis section and the recovery section.

4 Technical requirements

4.1 Limiting value of energy consumption per unit product of polyvinyl alcohol. The limiting value of the energy consumption per unit product of existing polyvinyl alcohol production plants shall comply with Table 1.

Table 1 has two columns, process route and comprehensive energy consumption per unit product of polyvinyl alcohol in kgce/t. It gives, for the acetylene method, not more than 2 750, and for the ethylene method, not more than 2 230.

4.2 Access value of energy consumption per unit product of polyvinyl alcohol. The access value of the energy consumption per unit product of newly built, rebuilt or expanded polyvinyl alcohol production plants shall comply with Table 2.

Table 2 has the same two columns and gives, for the acetylene method, not more than 2 072, and for the ethylene method, not more than 1 790.

4.3 Advanced value of energy consumption per unit product of polyvinyl alcohol. The advanced value of the energy consumption per unit product of polyvinyl alcohol production plants shall comply with Table 3.

Table 3 has the same two columns and gives, for the acetylene method, not more than 2 072, and for the ethylene method, not more than 1 350. The value printed for the acetylene method in Table 3 is the same as the one printed for the acetylene method in Table 2; both readings were checked at high magnification on the page.

5 Statistical scope and calculation method

5.1.1 The statistical scope of the comprehensive energy consumption of the polyvinyl alcohol product covers the whole production process, from the point where raw materials and energy are metered into the vinyl acetate synthesis process to the point where the finished polyvinyl alcohol is metered into store. It is made up of three parts: the energy consumption of the production system, of the auxiliary production system and of the ancillary production system.

a) Energy consumption of the production system. It includes the energy consumption of the main production processes, namely vinyl acetate synthesis, vinyl acetate rectification, vinyl acetate polymerisation, alcoholysis of the polyvinyl acetate resin and recovery of the alcoholysis waste liquor.

b) Energy consumption of the auxiliary production system. It includes the energy consumption of the processes, installations and equipment serving the production system, mainly power supply, machine repair, water supply, gas supply, heat supply, refrigeration, instrument repair, lighting, warehouses and the raw material yards inside the plant, and of the safety, environmental protection and energy-saving installations.

c) Energy consumption of the ancillary production system. It includes the energy consumption of the production command system (plant management) set up specifically for the production system and of the departments and units inside the plant area that serve production, mainly the dispatching room, offices, operating rooms, control rooms, rest rooms, changing rooms, bath house, central control analysis, product inspection and the maintenance section.

5.1.2 The waste heat, residual energy and heat of chemical reaction produced in polyvinyl alcohol production and recovered for use shall not be counted in the energy consumption. Where such waste heat, residual energy or heat of chemical reaction is supplied to other plants, the energy actually used shall be deducted from the energy consumption of the system.

5.2.1 The calculation of the comprehensive energy consumption shall comply with GB/T 2589.

5.2.2 This standard designates the qualified polyvinyl alcohol product of specification 100-27 in GB/T 12010.3-2010 as the polyvinyl alcohol reference product. The output of polyvinyl alcohol products of other specifications is converted into output of the reference product using the conversion coefficients given in Annex A.

5.2.3 The calorific values of the various forms of energy are converted into the single unit of measurement kilogram of standard coal (kgce). The calorific values used are those measured by the enterprise during the reporting period; where measurement is not possible, the conversion is made using the reference coefficients for conversion into standard coal given in Annex B or Annex C.

5.2.4 The comprehensive energy consumption of the polyvinyl alcohol product (E) equals the total quantity of the various forms of energy consumed in the production process minus the total quantity of the various forms of energy exported outside; it is expressed in kilograms of standard coal (kgce) and is calculated by formula (1). In the formula E is the value of the comprehensive energy consumption of polyvinyl alcohol in kgce; e with subscript i is the physical quantity of the i -th form of energy consumed in producing the polyvinyl alcohol product; e with subscript j is the physical quantity of the j -th form of energy exported during production of the polyvinyl alcohol product; K with subscript i is the coefficient converting the i -th input energy into standard coal; K with subscript j is the coefficient converting the j -th output energy into standard coal; m is the number of kinds of energy input; n is the number of kinds of energy output.