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Guide for the energy efficiency assessment of the prepainting process

钢带连续彩色涂层工序能效评估导则

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1 Scope

China's national guide to assessing the energy efficiency of the coil prepainting process. It specifies the terms and definitions, the assessment procedure, the boundary and scope of energy consumption accounting, the baseline and actual energy consumption, and the indicators and analysis. Prepainted steel is coil coated before it is formed: the strip runs continuously through cleaning, chemical pretreatment, prime coat, cure, finish coat and cure, and comes out as a painted product that will be cut and pressed into cladding, appliance panels and roofing. Coating steel this way uses far less energy and paint than spraying the finished article, and produces a more uniform film, but the line's own consumption is dominated by two ovens that must hold a strip travelling at a hundred metres a minute at curing temperature. Almost all the efficiency available is in those ovens and in what is done with their exhaust, since the solvent burned in the incinerator is itself a fuel that can heat the oven that released it.

This Standard specifies the terms and definitions, assessment procedures, boundary and scope of energy consumption statistics, benchmark energy consumption, actual energy consumption, energy efficiency index, energy efficiency analysis and energy efficiency optimization measures for the energy efficiency assessment of prepainting process. This Standard is applicable to the energy efficiency assessment and energy- saving potential analysis of prepainting process of an iron and steel enterprise.

2 Normative references

The following documents are essential to the application of this document. For dated

references, only the editions with the dates indicated are applicable to this document. For undated references, only the latest editions (including all the amendments) are applicable to this document.

GB 17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using

GB/T 21368 Specification for equipping and managing of measuring instrument of energy in the iron and steel industry

GB/T 23331 Energy management systems -- Requirements

GB/T 28924 Guides for calculating energy efficiency index of an iron and steel enterprise YB/T 4210 Determination and calculation of heat balance of incinerator & solidification furnace for CCL YB/T 4662 Guides for energy efficiency assessment of an iron and steel enterprise

3 Terms and definitions

The terms and definitions defined by GB/T 23331, GB/T 28924, and YB/T 4662 consumption of gas, natural gas, electricity (the incinerator and the curing furnace are heated separately from the others), circulating water, compressed air, steam, etc.;

d) energy recovery, such as steam recovery, recovered steam pressure, temperature, etc.;

e) ambient temperature.

7.1.2 The field data acquisition shall be carried out in accordance with YB/T 4210.

7.2 Principle for standard coal conversion coefficient of energy and energy-consuming working media

7.2.1 The actual fuel energy consumed by the energy-using unit shall be converted into the amount of standard coal based on its net calorific value. For unmeasured ones, SEE Table B.1.

7.2.2 Steam shall be converted into the amount of standard coal based on its enthalpy value. SEE Table B.2.

7.2.3 The standard coal used for the conversion of energy-consuming working medium is shown in Table B.3.

7.2.4 The conversion relationship between standard coal and heat is 1 kgce = 29 307.6 kJ.

7.2.5 The equivalent value of the electric standard coal conversion coefficient shall be taken, that is, 1 kW·h = 0.122 9 kgce.

7.3 Actual energy consumption calculation The actual energy consumption is calculated according to the Formula (3). Where. ex - Actual energy consumption of the prepainting

process during the statistical period, in kilograms of standard coal per ton (kgce/t); ein - Direct energy consumption of the prepainting process during the statistical period, in kilograms of standard coal (kgce); eout - Energy recovered by the prepainting process for external supply during the statistical period, in kilograms of standard coal (kgce); p - Conforming product quantity of the prepainting process during the statistical in accordance with GB/T 15316.

9.3 Analysis of energy efficiency level The analysis of energy efficiency level shall include but shall not be limited to the following.

a) Energy efficiency analysis of prepainting process;

b) The energy consumption analysis of incinerator and curing furnace for prepainting process can be in accordance with GB/T 29727;

10 Energy efficiency optimization measures

The prepainting process can use but is not limited to the following energy efficiency optimization measures.

a) IMPROVE the energy control level;

b) Energy recovery technology of coating waste gas incineration;

c) Energy-saving and environment-friendly combustion technology of the incinerator;

d) Energy-saving insulation material technology of the incinerator and curing furnace;

e) Efficient waste heat recovery technology;

f) Precise temperature control technology of the steel strips;

g) Power-saving technology such as frequency control, permanent magnet speed control, high-efficiency motors, etc.;