

JIS

JAPANESE INDUSTRIAL STANDARD

Disposable body warmers

Ⓔ **JIS S 4100—1996**

Translated and Published

by

Japanese Standards Association

**In the event of any doubt arising,
the original Standard in Japanese is to be final authority**

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association.

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Errata are also provided to subscribers of JIS (English edition) in *Monthly Information*.



1. **Scope** This Japanese Industrial Standard specifies warmers to raise the temperature by using the chemical reaction of contained components as the heat source without giving outer energy (excluding oxygen, water, etc.) such as fire, electricity, etc. (hereafter referred to as "disposable body warmers").

Remarks: The standards cited in this Standard are shown in the following:

JIS A 5304 Concrete flags

JIS G 4304 Hot rolled stainless steel plates, sheets and strip

JIS K 7126 Testing method for gas transmission rate through plastic film and sheeting

JIS Z 0208 Testing methods for determination of the water vapour transmission rate of moisture-proof packaging materials (dish method)

JIS Z 8401 Rules for rounding off of numerical values

JIS Z 8703 Standard atmospheric conditions for testing

2. **Definitions** For the purposes of this Standard the following definitions apply:

- (1) rise time The time required for raising temperature from immediately after the beginning of heating up to 40°C.
- (2) temperature guarantee time The time of maintaining the temperature not lower than the intermediate temperature between the highest temperature and 40°C.
- (3) maintaining time The time to maintain and continue the temperature of not less than 40°C.

3. **Classification** The classification shall be as follows:

- (1) Unadhesive type
- (2) Adhesive type

4. **Quality**

4.1 Sealing property The sealing property of outer bag shall be tested according to 6.2, and not generate air bubbles.

4.2 Strength of bag

4.2.1 Inner bag The strength of inner bag shall be tested according to 6.3, and free from abnormalities such as breaking and the like.

4.2.2 Outer bag The tensile strength of outer bag shall be tested according to 6.4, and free from abnormalities such as breaking and the like.

4.3 Temperature characteristics The temperature characteristics shall be tested according to 6.6, and comply with Table 1.

Table 1. Temperature characteristics

Item	Specification
Highest temperature	70°C max.
Rise time	20 min max.
Temperature guarantee time	Not less than 50 % of maintaining time
Maintaining time	Not less than the marked maintaining time

4.4 Adhering strength The adhering strength of the adhesive type warmers shall be free from displacement and abnormalities on products and underlay member when tested in accordance with 6.7.

5. Materials

5.1 Raw materials The main component of raw material used for disposable body warmers shall be iron powder.

Further, the deleterious material to human body shall be tested according to 6.5 and comply with Table 2.

Table 2. Elution amounts of deleterious materials

Unit: mg/l	
Item	Amount of elution
Lead	3 max.
Cadmium	0.3 max.
Arsenic	1.5 max.
Total mercury	0.005 max.
Hexavalent chromium	1.5 max.

5.2 Airtight property of outer bag material The airtight property of the outer bag material shall be tested according to 6.8 and comply with Table 3.

Table 3. Airtight property of outer bag material

Item	Specified value
Water vapor transmission rate $\text{g/m}^2 \cdot 24 \text{ h}$	4.0 max.
Oxygen transmission rate $\text{mol/m}^2 \cdot \text{s} \cdot \text{Pa}$	6.1×10^{-14} max.