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**Protective clothing for users of hand-held
chain-saws — Part 6: Test methods and
performance requirements for upper body
protectors**

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Health, Labour and Welfare and the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal of establishing a Japanese Industrial Standard from Japan Safety Appliances Association (JSAA)/Japanese Standards Association (JSA), with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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JIS T 8125 consists of the following 6 parts under the general title “*Protective clothing for users of hand-held chain-saws*”:

Part 1 : Test rig driven by a flywheel for testing resistance to cutting by a chain-saw

Part 2 : Test methods and performance requirements for leg protectors

Part 3 : Test methods for footwear

Part 4 : Test methods and performance requirements for protective gloves

Part 5 : Test methods and performance requirements for protective gaiters

Part 6 : Test methods and performance requirements for upper body protectors

Protective clothing for users of hand-held chain-saws— Part 6: Test methods and performance requirements for upper body protectors

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of ISO 11393-6 published in 2007 with some modifications of the technical contents concerning the variety of usages in Japan and the quality improvement of protective gloves.

The portions with continuous sidelines or dotted underlines in this Standard are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with explanations is given in Annex JA.

This Standard forms part of a series concerned with personal protective equipment designed to protect against the risks arising from the use of hand-held chain-saws.

No personal protective equipment can ensure a 100 % protection against cuffing from a hand-held chain-saw. Nevertheless, experience has shown that it is possible to design personal protective equipment which offers a certain degree of protection.

Different functional principles may be applied in order to give protection. These include:

- a) chain slipping: the chain slips on the surface of protective materials, and it does not cut the human body. This is one of protection effects;
- b) clogging: fibres, threads and other materials are drawn by the chain into the drive sprocket and block chain movement;
- c) chain braking: fibres and other materials have a high resistance to cutting and absorb rotational energy, thereby reducing the chain speed.

1 Scope

This Standard specifies test methods and requirements for the protection offered by upper body protectors against cutting by a hand-held chain-saw.

NOTE: The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 11393-6 : 2007 *Protective clothing for users of hand-held chain-saws—Part 6: Test methods and performance requirements for upper body protectors* (MOD)

In addition, symbols, which denote the degree of correspondence in the contents between the relevant International Standard and JIS, are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS K 6400-2 *Flexible cellular polymeric materials—Determination of the physical properties — Part 2: Hardness (indentation technique) and stress-strain characteristics in compression*

JIS L 1018 *Test methods for knitted fabrics*

NOTE : Corresponding International Standards : ISO 3175-1 *Textiles — Professional care, drycleaning and wetcleaning of fabrics and garments—Part 1: Assessment of performance after cleaning and finishing*, ISO 3175-2 *Textiles—Professional care, drycleaning and wetcleaning of fabrics and garments—Part 2: Procedure for testing performance when cleaning and finishing using tetrachloroethylene*, ISO 5077 *Textiles—Determination of dimensional change in washing and drying* and ISO 6330 *Textiles—Domestic washing and drying procedures for textile testing* (Overall evaluation : MOD)

JIS L 1096 *Testing methods for woven fabrics*

JIS L 1909 *Textiles—Determination of dimensional change*

JIS T 8005 *Protective clothing—General requirements*

NOTE : Corresponding International Standard : ISO 13688 *Protective clothing—General requirements* (MOD)

JIS T 8125-1 *Protective clothing for users of hand-held chain-saws—Part 1: Test rig driven by a flywheel for testing resistance to cutting by a chain-saw*

NOTE : Corresponding International Standard : ISO 11393-1 *Protective clothing for users of hand-held chain-saws—Part 1: Test rig driven by a flywheel for testing resistance to cutting by a chain-saw* (MOD)

JIS T 8125-3 *Protective clothing for users of hand-held chain-saws—Part 3: Test methods for footwear*

NOTE : Corresponding International Standard : ISO 11393-3 *Protective clothing for users of hand-held chain-saws—Part 3: Test methods for footwear* (MOD)

ISO 11092 *Textiles—Physiological effects—Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)*

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 upper body protector

any protective clothing specified in this Standard, which fulfills the performance requirements to protect the protection area of the upper part of the body, e.g. jacket

3.2 front

part of a garment covering the forward 50 % of the upper body circumference

3.3 rear

part of a garment covering the rear 50 % of the upper body circumference

NOTE : Depending upon design and construction, and due to many layers of protective material, it can be difficult to establish the division between the front and the rear of an upper body protector. It is nevertheless of great importance to establish this.

3.4 protective material

material which is designed to protect the wearer against the cutting effect of a hand-held chain-saw

NOTE : This protective material may include the cloth of the garment.

3.5 unit of protective material

cut out piece or panel of protective material consisting of all the fabric or other layers that constitute the protective material that go into the construction of a garment

NOTE : A unit has no seams or joins within it. Units can be joined together to provide the complete protective coverage required, before insertion and attachment to garments, but such units retain their individuality for testing purposes.

3.6 protective coverage

area of the garment which consists of protective material

NOTE : This is equal to or wider than the protective area as specified in 3.7.

3.7 specified protective area

required protective coverage

3.8 cut through

that the cutting length exceeds 10 mm in the protective material surface that is nearest to the body side under the cutting test of the protective material

NOTE : Suppose that a single-layer or multi-layer material specimen constitutes the finished product such as specimen. Apply a moving chain-saw to the specimen surface that is farthest from the wearer's body. When a chain-saw continues to cut the specimen layer, being decelerated and finally stops, it means that the cutting of over 10 mm is found on the surface opposite to the surface to which a chain-saw is applied (see JIS T 8125-1).

3.9 garment

one item of clothing, which consists of a single-layer or multi-layer material

4 Requirements

4.1 General

Upper body protectors shall meet an overall requirement specified in **JIS T 8005** that they are safe and fit for the purpose. They shall meet requirements listed in 4.2 to 4.7.

4.2 Innocuousness

Upper body protectors shall be designed and manufactured to provide protection when used in accordance with the manufacturer's instructions, without endangering the user or others. Construction materials and incorporated substances shall not endanger those coming into contact with them. The substances that might be contained in products and that are generally known to cause sensitization shall be marked. The countermeasures against allergies shall be also marked as warning. The surface, edges and fasteners of upper body protectors shall be free of hard or sharp components such as edges, seams, fasteners, etc. that might injure users or others. The manufacturer shall give guidance on the safe destruction and disposal of the products and of any hazards that can arise during mechanically disrupting or incinerating the product.

4.3 Ergonomic requirements

The protective clothing should be as lightweight as possible.

The design shall be without appendages, which can become entangled in a chain-saw or the undergrowth.

The construction around the sleeve shall facilitate bending and lifting the arm.

If there is a request between the parties concerned with delivery (acceptance), then the water vapour resistance of the garment outside the specific protected area shall be no more than $5 \text{ m}^2 \cdot \text{Pa/W}$ when tested in accordance with 12.1.

The protective garments shall be designed to minimize discomfort and restriction while wearing them. When tested in accordance with 12.2 and 12.3, the score of all subjects shall be less than 1.5 for each of comfort and restriction.

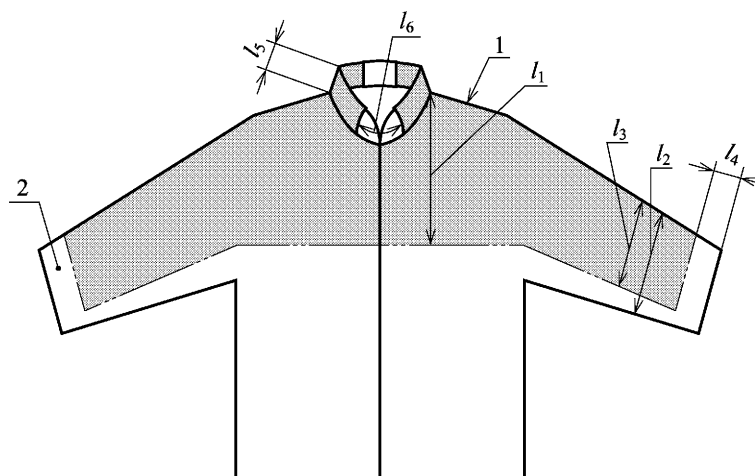
4.4 Specified minimum protective area for upper body protectors

4.4.1 General

The protective coverage shall be measured in accordance with clause 9.

4.4.2 Front

The specified protective area shall cover the front of the garment from the top of the shoulder downwards for a distance (l_1) equivalent to at least 25 % of the chest girth specified by table 1 of clause 6 of **JIS T 8005**. The protective area shall include the upper 80 % of the surface of the front of the sleeve down to within 70 mm of the lower edge of the cuff of the sleeve (see figure 1).



- 1 top of shoulder
- 2 cuff
- l_1 minimum height of protective coverage at the front of the garment
- l_2 width of sleeve
- l_3 width of protective coverage on the front of the sleeve (minimum 80 % of l_2)
- l_4 unprotected cuff, width less than 70 mm
- l_5 height of protective coverage in collar, minimum of 30 mm
- l_6 gap in the protective coverage in the collar, maximum of 80 mm

Figure 1 Specified protective area: front of garment

4.4.3 Back

The protective area shall cover the top of the shoulders plus the superior 40 % of the surface of the back of the sleeve down to within 70 mm of the lower edge of the cuff of the sleeve (see figure 2).

A gap is permitted in the protective material in the centre of the back. The dimensions of the gap, l_5 and l_6 , are shown in figure 2. The dimension (l_5) shall be less than 9 % of the chest girth specified in table 1 of clause 6 of JIS T 8005. The dimension (l_6) shall be less than 35 % of the chest girth of the smallest intended user of the garment.