

Proposal for legal inspection of power press or shearing machinery and similar equipment

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Background:

At the request of industry and the objective of ensuring protection of workers in the working place, the Bureau of Standards, Metrology and Inspection (BSMI), having coordinated with the Council of Labour Affairs, the competent authority of safety of workers, would like to require that power press or shearing machinery and similar equipment pass legal inspection before they are marketed.

Proposed date of implementation:

January 1, 2009

Products (HS/CCCN codes) covered and their applicable inspection standards:

C.C.C. Code (the first 6 digits being the same as HS Code)	Description of Goods	Inspection Standards
8462.10.10.00.1	Forging machines (inspection scope: forging machines for the cold working of metals, with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Standard of Prevention and Guarding Devices–Machinery and Tools (announced by the Council of Labor Affairs on July 27, 1992, and amended on July 30, 2004)
8462.10.20.00.9	Die-stamping machines (including presses) (inspection scope: Die-stamping machines for the cold working of metals, with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.
8462.29.00.00.2	Other bending, folding, straightening or flattening machines for metal (inspection scope: folding machines with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.
8462.31.00.00.8	Numerically controlled shearing machines (inspection scope: shearing machines with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.
8462.39.00.00.0	Other shearing machines (inspection scope: shearing machines with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.
8462.41.00.00.6	Numerically controlled punching or notching machines (including presses), including combined punching and shearing machines (inspection scope: numerically controlled punching or notching machines, including combined punching and shearing machines with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.
8462.49.00.00.8	Other punching or notching machines (including presses), including combined punching and shearing machines (inspection scope: numerically controlled punching or notching machines, including combined punching and shearing machines with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30	Same as above.

	mm/s)	
8462.91.00.00.5	Hydraulic presses (inspection scope: hydraulic and/or pneumatic presses with manual loading and/or unloading, whose movable working parts may have a travel exceeding 6 mm and a speed exceeding 30 mm/s)	Same as above.

Other requirements:

1. The products listed in the Table will be subject to the Registration of Product Certification (PRC) Scheme from January 1, 2009.
2. For products listed in the Table, the import regulation code in the “Classification of Import & Export Commodities of the Republic of China” is assigned as C02.
3. Pursuant to Article 4 of the “Regulations Governing Registration of Product Certification”, the information or technical documents required by the BSMI for RPC shall be submitted and include the following documents:
 - (1) A copy of the legal status identification documents of the applicant, except if identical documents have been previously registered with the Commodity Certification Bodies commissioned by the BSMI;
 - (2) The Conformity Certificate of Type Approve issued by the contracted inspection agency under the “Regulations Governing Implementation of Type Approve for Machinery or Tools” established by the Council of Labor Affairs;
 - (3) A general description of the product;
 - (4) Any calculation notes for product safety;
 - (5) Any technical report and/or certificate giving the results of the performance tests relating to product safety carried out either by manufacturer or by a body chosen by the manufacturer;
 - (6) A copy of the instructions necessary for understanding the operation and maintenance of the product listed in the Table;
 - (7) Any certificates of the key components;
 - (8) A description of the protective measures, such as safety guarding or protective device, etc. implemented to demonstrate the conformity to specified inspection standard;
 - (9) The drawings of the circuit layouts for safety devices; and
 - (10) A declaration of conformity-to-type.
4. The conformity assessment modules for the products listed are Module II in combination with Module III, both being carried out in accordance with Article 3 of the “Regulations Governing Registration of Product Certification.”
The Conformity Certificate of Type Approve issued by the contracted inspection agency under the “Regulations Governing Implementation of Type Approve for Machinery or Tools” established by the Council of Labor Affairs will substitute the type testing report in accordance with the second paragraph of Article 4 of “Regulations Governing Registration of Product Certification.”
5. The application for registration of product certification shall be submitted to the Commodity Certification Bodies commissioned by the BSMI.
6. The timeframe for completing the registration of product certification for the product listed in the Table is 14 working days, including the review and evaluation processes. The time period of waiting for samples and / or necessary documents for review and evaluation is excluded. Another 7 working days will be needed if the certification body finds it necessary to take sample and test the key points for review and evaluation purpose.
7. The term of validity of an RPC certificate is 3 years. For certificates that are issued prior to the date of entry into force set forth in this public notice, the term of validity will be from the date of issuing to December 31, 2011.
8. The obligatory inspection applicants for the products listed in the Table are permitted to print the Commodity Inspection Mark by themselves.
9. The inspection standards shall be the latest version of standards as of the date the public notice of this measure. When the applicable standards are revised or amended, the date of applying these revised or amended standards for inspection shall be decided and announced by the BSMI.
10. The products having combined functions or multi-functions shall further comply with other relevant standards and the requirements of the conformity assessment.
11. The relevant statutory fees shall be charged in accordance with the “Regulations Governing Fees for Commodity Inspection”.

Standard of Prevention and Guarding Devices–Machinery and Tools

Chapter 1 General Principles

Article 1:

Having accordance with regulations of article 5 of Labor Safety and Health Act (abbreviation: this Act), thereof this standard is established.

Article 2:

The performance category of protection equipment and guarding devices installed by an employer in the machinery or tools, where they are in the definition scope of article 7 of Enforcement Rules of this Act, shall not be lower than those requirements of this standard.

Chapter 2 Protection and Guarding of the Power Press Machinery

Article 8:

The power press machinery referred in subparagraph 1, article 7 in Enforcement Rules of this Act is the machine driven by power to do percussion forming and shear cutting machine (contracted: press machinery afterward), where its standard of protection and safeguarding shall follow this chapter.

Article 9:

The press machinery shall be incorporated with safety guarding; its intended function is focus on preventing the prohibited labor body parts to access into the margin of dangerous area of slide or die movement. It is not applicable for the machinery type which the slide or die does not endanger the labor body parts.

If it is difficult to install the above safety guarding mentioned for a practical operation, the safety protection device shall be used. However, it does not apply to one of the following equipments:

1. Special hand tools with one-hand operating, where the other hand needs to be guarded by protection devices.
2. Special hand tool with two hands operating, where two hands are used to load or unload products.

Article 10:

The above mentioned press machinery with selectors for the following operating modes, under any one of the operating modes, shall comply with the requirements of

the safety protection device in previous article:

1. Operation selector for “continuous,” “single stroke,” “single stroke mechanism” and “inch.”
2. Exchange from two-hand control into single hand control, or exchange from two hand control into foot pedal control.
3. Switches to change the operating mode from multi operation stations to single operating station.
4. Switches to place the safety device on either “ON” or “OFF” position.

Article 11:

A safety guarding shall contain the following functions:

1. The safety guarding shall prevent the entry of the operator’s hands or fingers into the point of operation.
2. Safety die - the gap between upper die and lower die of the top dead centre (or the gap between upper die and the lower eject plate of TDC while the eject plate used) and the gap between the guide post and the axle bushing shall be less than 8 mm.
3. Press machinery for certain purposes, whose construction cannot endanger the labor’s body parts to interfere the dangerous area.
4. Automatic press machinery shall contain with the automatic material feeding, processing and discharging constructions.

Article 12:

Safety devices shall have the following functions:

1. Holdout or restraint device: preventing the labor’s body parts from accessing to the dangerous area when the slide, die and puncher (contracted: “slide, etc.” afterward) are in motion.
2. Two hand control device: it can stop the movement of slide, etc. before the hand reaching the margin of dangerous area after the labor pushes the actuation button or operates the control lever (contracted: “buttons, etc.” afterward)(single stroke mechanism). Moreover, using two hands to operate the actuation buttons, etc. when the slide, etc. are under movement, the hands cannot reach the margin of dangerous area after the button, etc. are released (two hand trip device).
3. Presence sensing device: when slides, etc. in motion, any body parts reaching the margin of dangerous area would stop the motion of slides, etc.
4. Pullout or sweep device: as any body parts reaching the margin of dangerous area, the body parts would be pullout or sweep away from the dangerous area following by the motion of slides.

Article 13:

The two-hand trip device and the presence sensing device shall comply with the following regulations:

1. The safety device must be able to adapt into kinds, functions, strokes per minute, stroke length, and operating methods of press machinery.
2. The safety device must be able to adapt to stop functions of the press machinery.

Article 14:

The stop function in the subparagraph 2 of the foregoing article, namely a built-in delay time, etc. of the two hand trip device and the presence sensing device, which shall possess one of the following characteristics:

1. $D > 1.6 (T_1 + T_s)$, where

D: For the two hand control device with single stroke, it means the distance between the buttons, etc. and margin of dangerous area. And for the presence sensing device, it means the distance between the sensing area and the margin of dangerous area. The unit is mm for both cases.

T_1 : For the two hand control device with single stroke, it means the time from the fingers leave the actuation buttons, etc. till the emergency stop mechanism activated. For the Presence sensing device, it means the time from the fingers interfere the sensing area till the emergency stop mechanism activated. The unit is ms for both cases.

T_s : The response time from the emergency stop mechanism activated till the motion of slide stopped. The unit is ms.

2. $D > 1.6 T_m$, where

D: For the Two hand trip safety device, it means the distance between the buttons and the margin of dangerous area. The unit is mm.

T_m : the maximum response time required from hands leave the buttons, etc. until the slide reaches the top dead centre. The unit is ms.

$$T_m = \left[1/2 + \frac{1}{\text{numbers of engaging points per revolution}} \right] \times \text{time necessary to complete one revolution of the crank shaft}$$

Article 15:

The presence sensing device in article 13 shall be the opto-electronic type device or the device with the same or better performance.

Article 16:

Safety devices shall comply with the following regulations:

1. The main body, linkage rings, construction materials and control levers shall have

the sufficient strength.

2. Ancillary parts:
 - a) The material shall be in compliance with class (S45C) in CNS3828 “*Carbon Steels for Machine Structural Use*” or with equivalent or above mechanical properties.
 - b) The associated surfaces are processed with quenching or annealing; and their hardness shall be within the range of HRC 45 ~ 50.
3. Wire rope:
 - a) The wire rope used must be in accordance with CNS10000 “*Wire Ropes for Mechanical Control*” or with equivalent or above mechanical characteristics.
 - b) Clamping tools such as rope clamps, pliers, etc. applied in the slides, control bars, etc. shall be firmly installed.
4. The bolts, nuts, etc. which could cause safety devices malfunction or ancillary parts slide off must be prevented from loosen. Furthermore, pins used in the chain shall also be tied to prevent loosen.
5. Relays, limit switches and other main electric components shall have the sufficient strength and endurance to ensure the function of the safety device installed.
6. There shall be indicating lights to manifest the actions, contacting status of relays and other electrical circuit problems of the safety device with electrical circuits.
7. There shall be an anti-vibration means in the mounting areas of electrical components such as relays, transistors, etc.
8. When electrical parts such as relays, limit switches, etc. of safety devices are malfunction or electricity out, the electrical circuits shall be designed with a function to stop the action of slides and prevent accidents.
9. The voltage supplying to electrical circuits for operation shall be under 150V.
10. The external electricity cable used for the safety device shall comply with regulations of CNS6556 “*600V Grade Polyvinylchloride Insulated and Sheathed Portable Power Cables,*” or with equivalent insulation effect, anti-oil, strength and endurance or above.
11. Switch Device:
 - a) Button type switches shall allow the user to choose the separate exchange positions in the button device.
 - b) It shall be able to keep in each selected mode.
 - c) There shall be a clear indication marking on each selected position in the safety device.

Article 17:

A protective safety device shall be in conformity with the following regulations:

1. Except “Inch” motion, its construction shall be so designed that the slide cannot work until the protective device has closed completely and the protective device cannot be opened when the slide is working.
2. The limit switch used to control the slide motion shall be able to prevent contacts by body parts, materials and foreign objects other than the protective device.

Article 18:

A two-hand control device shall comply with the following regulations:

1. The mechanism of single stroke one stop (single stroke safety device) shall be contained. But two-hand control device used in the press and shear machinery with repetitive single stroke one stop mechanism (two hand trip safety device) is excluded.
2. For the single stroke safety device, if there is a chance that hands can access to the margin of dangerous area after buttons, etc. released, when slides, etc. are in motion, there shall be a construction to stop slides, etc. from action.
3. A two-hand trip safety device shall be designed with a construction that the slide will reach the bottom dead centre before labor hands leaving from the start buttons just pressed can access to the margin of dangerous area.
4. The safety device must have the construction to prevent slides, etc. from action when it is not operated with two hands simultaneously.
5. The safety device must have the construction to prevent the device from action when both hands are still on the single stroke button, etc.
6. The distances between edges of two buttons, etc. must be at least 300 mm.
7. As buttons are within a shrouding box, the buttons shall not protrude their shrouding boxes’ surface.

Article 19:

Presence sensing devices shall comply with the following regulations:

1. For the presence sensing device of press machinery, its function is to stop the slide, etc. from action when any body parts interrupt the light beams of the device.
2. For the presence sensing device of press forming machinery, the light emitter and light receiver shall operate efficiently over the whole length (it is abbreviated as preventive height and considered as 400 mm when it is over 400 mm) of the adjustment length plus the cycle stroke of the slide.
3. For previous subparagraph, there shall be more than two light beams of light emitters and receivers and the distance between two light beams shall be less than 50 mm.(The distance between two light beams may be less than 70 mm if for light

emitters and receivers, the horizontal distance between the vertical plane of light beams and the margin of dangerous area is over 500 mm)

4. For presence sensing device of shear cutting machine, the light beam's height above the shear bed of the light emitter and receiver shall be less than 0.67 time of the horizontal distance between the vertical plane of light beams and the margin of dangerous area. (The value is considered as 180 mm when it is over 180 mm).
5. For the light emitter and receiver of previous subparagraph, when the horizontal distance between the vertical plane of light beams and the margin of dangerous area is over 270 mm, there shall be more than one light beam between the die and the light beam.
6. For the presence sensing device of press machinery, when the light emitter is not applying the incandescent bulb, the receiver shall be designed with a construction to only sense the light from the emitter but not other light sources. When the incandescent bulb is applied, the designed sensor shall not be affected by the normal light supplied in 110V and rated in 100W and located more than 50 mm from the light beams.

Article 20:

A pullout safety device shall comply with the following regulations:

1. As the pullback straps utilized, the pullout length shall be adjustable. The length is more than half of the press bed depth.
2. The material of pullout straps shall be synthetic fiber and the diameter shall be more than 4 mm. Furthermore, the break loading under installed attachment shall be more than 150 kg.
3. The material of wrist bards shall be made of leather, etc., and the connection parts to pullout straps shall withstand more than 50 kg of static loading.

Article 21:

A sweep safety device shall comply with the following regulations:

1. There shall be devices to adjust the length and sweep radius of sweep arms.
2. For sweep arms, they shall be installed with protection plates to ensure safety of hands while the slides are working. The plate width shall be more than half of the metal die width (for metal die width less than 200 mm, the width of protection plate is 100 mm in press machinery), and its height shall be more than the stroke (for stroke over 300 mm, the height of protection plate is 300 mm in press machinery). Sweep radius of a sweep arm shall be over the metal die width.
3. There shall be devices to slow down the impact when sweep arms and protection plates contact with hands, etc.

Article 85:

The machines and tools specified by this standard shall not only be in compliance with the necessary regulations mentioned in the above chapters, but also, for inspection, maintenance and operation purpose, shall be in compliance with the following regulations of marking:

1. For safety device of press machine, the following items shall be marked:
 - (1) Manufacturing number
 - (2) Manufacturer's name
 - (3) Manufacturing date
 - (4) The model of press machine, press capacity, stroke length (except for two hand control safety device), strokes per minute (except for two hand control safety device and presence sensing safety device) and size range of metal die.
 - (5) The following matters shall be marked on the two hands control and presence sensing safety devices.
 - a) The two hands control safety device specified in subparagraph 2 of article 18 (safety device with single stroke mechanism): the time from the both hands leave the button to actuate the emergency stop device in millisecond.
 - b) The two hands control safety device specified by subparagraph 3 of article 18 (two hand trip safety device): the longest time from hands actuating the button to the slide of press machine reaching the Bottom dead centre in millisecond.
 - c) Presence sensing safety device: the time from the light beam interrupted by hands to emergency stop device actuated in millisecond.
 - d) The stop time of press machine in operation (from emergency stop actuated till slides stop) in millisecond.
 - e) According to the stop time in d) of this item, (for single stroke safety device and presence sensing device) and according to the longest time needed in b) of this item (for two hand control safety device), the correspondent distance in millimeter. (For two hand control safety device the distance is between the push button and the dangerous margin and for presence sensing device, the distance is between the light beam and the dangerous margin.)
 - (6) The following matters shall be marked on the presence sensing device.

- a) The effective distance in millimeter. (The effective actuation distance between the emitter and receiver.)
 - b) Protection height of press machine in millimeter.
2. The following matters shall be marked on the safety device of shear machine.
- a) Manufacturing number
 - b) Manufacturer's name
 - c) Manufacturing date
 - d) Model of shear machine
 - e) Shear thickness in millimeter
 - f) Length of shear knife blade in millimeter
 - g) For presence sensing safety device, a) of item (6) of the above subparagraph shall be marked.