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CANCELLATION
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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Specification
for

FUSION BONDING MACHINE; ELECTRIC

CGSB Specification 23-GP-2, dated 28 September 1949, is cancelled as of
11 March 1966.

Specification for
FUSION BONDING MACHINE - ELECTRIC*

(For Preparation of Metal Surfaces for Metallizing)

A. DEFINITION

A-1 This specification applies to an electrically-operated machine designed for the purpose of preparing metal surfaces for metallizing, by deposition of small, molten globules of electrode metal and bonding them to the metal surface.

B. TYPE

B-1 The Electric Fusion Bonding Machine defined in this specification shall be of the A.C. transformer, portable type.

C. COMPLIANCE WITH REGULATIONS

C-1 In addition to meeting the requirements of this specification, the Electric Fusion Bonding Machine shall carry the approval of the Canadian Standards Association.

D. MATERIALS

D-1 The complete Fusion Bonding Unit shall consist of the following items:

D-1a A power Unit, rigidly mounted in a portable cabinet, having a 2-pole primary switch and a secondary outlet, and equipped with a suitable length of 3-conductor primary cable.

D-1b An Electrode Holder complete with cable and air hose.

D-1c One pair of goggles, safety-approved type.

D-1d 25-lb. package of Electrodes (Fusion Bonding)

D-1e Two copies of an Instruction and Operation Manual, and a spare parts list.

NOTE: When requested by the purchaser, the Unit shall also contain a contactor brush and cable with tool post mounting.

* This specification is not to be construed as granting any right in connection with any method, apparatus or product covered by letters patent or as insuring anyone against liability for infringement of letters patent.

E. GENERAL REQUIREMENTS

E-1 The Electric Fusion Bonding Machine shall comprise a transformer of suitable volt-ampere output characteristics with suitable output selection means mounted within an enclosure, arranged for portability, and having input and output connections.

E-1a The machine shall operate satisfactorily on one or more of the following; 110, 220, 440, or 550 volts, from a single phase, supplied for either 25 or 60 cycle supply line.

E-2 Primary Characteristics - The primary shall be arranged for connection to either 110, 220, 440, or 550 volts, as specified by the purchaser.

E-3 Secondary Characteristics - With the output selection set for maximum output, the secondary shall deliver 8 to 10 volts open circuit, and at rated secondary amperage the voltage shall be not less than 75 per cent of open circuit voltage.

E-4 Output Adjustment - There shall be provided at least six steps of adjustment, not including the "off" position, with a proper description of the use of each adjustment clearly marked on the machine cabinet as well as in the Instruction Manual.

F. DETAILED REQUIREMENTS

F-1 TRANSFORMER

F-1a The transformer shall be so constructed as to prevent slipping, spreading, or buckling of the core laminations. Coils shall be thoroughly impregnated so as to prevent any moisture absorption, and shall be securely fastened to prevent chafing of insulation, movement of conductors in coils, or movement of coils on the core. The outside of the coils shall be adequately protected to prevent fraying or mechanical injury.

F-1b The means for securing the transformer to the cabinet shall be independent of any fastenings used in the construction of the transformer.

F-1c The insulation of the transformer shall be Class B, as defined by Canadian Standards Association.*

* See Canadian Electrical Code, Part 2 (No. 0).

F-1d The machine shall be rated on the basis of amperes through the entire secondary winding of the transformer required to produce a temperature rise of 75°C . (167°F .) in one hour, with the output selection adjusted for maximum output. When adjusted for maximum output, short circuiting the secondary terminals of the transformer shall produce an amperage not greater than three times the rated amperage.

F-1e The primary or input circuit shall be provided with a "Quick-Make, Quick-Break" switch mounted on the cabinet, and clearly marked to show "ON" and "OFF" positions. This switch shall be independent of the output selection, and shall be provided with 2 poles, one in each side of the primary circuit to the transformer, so that with the switch in the "OFF" position no portion of the transformer will be alive to ground if the machine is connected to a grounded power supply system. The switch shall be rated at, and capable of interrupting, at least twice the input current at rated secondary load.

F-2 CABLES

F-2a Primary Cable - The primary cable shall be of the 3-conductor type. It shall be of suitable length and equipped with a three-pole plug of suitable construction, and ground connections legibly marked. A three-pole receptacle shall be furnished with each unit, with ground connection properly and legibly marked for wiring. The cable shall have at least 600-volt type insulation, and shall have a current capacity equal to, or in excess of, the highest input current at rated load as shown on the nameplate.

F-2b Work Cables - Work cables shall be at least 6 feet long and of such capacity that the voltage drop in the cables, at rated load, does not exceed 10 per cent of the maximum open circuit secondary voltage. Work cables shall be alike and interchangeable, and their plugs and jacks, when exposed to the operator, shall be insulated with non-moisture absorbing material. All plugs shall make up into their respective jacks so as to leave no current-carrying metal exposed.

F-3 ELECTRODE HOLDER

F-3a The electrode holder shall be made so as to accommodate one or more electrodes at one time, and shall be arranged so that the electrodes, as they are used, can be advanced through the holder without the aid of tools. Electrodes shall be clamped in the holder with a suitable device, and clamping pressure on the electrodes shall be obtained independent of the operator.

F-3b Electrodes shall be readily inserted and removed from the holder without the use of tools even though bent to 15° on a 1" radius at any one point throughout their length.*

F-3c The electrode holder shall be provided with means for air-cooling the electrodes while in use. The holder cooling system shall be arranged so as to consume not more than 2 cubic feet of air per minute at 90 psi. pressure, and shall operate independent of air pressure regulator on any air line with pressures up to 125 psi.

F-4 CONTACTOR BRUSH (Optional)

When a contactor brush for making electrical connection to rotating work pieces is provided at the request of the purchaser, it shall meet the following requirements:

F-4a It shall be resilient so as to avoid scratching or damaging the surface of the work, and shall be suitably mounted on a tool post holder for rigid attachment to machine tools such as lathes; boring mills, or other mechanical devices.

F-4b It shall be adaptable to inside, outside, or end surfaces of rotating pieces, and shall be removable from the work cable so that the cable lug may be rigidly clamped to stationary work pieces.

F-4c It shall be arranged so that no part of the operating current is carried through any part of the mechanical equipment holding the work, so that no possible damage may result to bearings, spindles, etc., due to arcing, sparking, heating, or pitting.

F-5 CABINET

F-5a The cabinet shall be so constructed that all internal parts are readily accessible.

F-5b The cabinet shall provide:

F-5b(1) Storage compartments to contain all cables, electrode material, and accessories.

F-5b(2) Means for stowing the primary cable within a storage compartment without disconnecting it from the primary circuit.

F-5b(3) Free natural ventilation sufficient for adequate cooling, and means for preventing the entrance of any falling material into the transformer housing.

* Note: This requirement does not apply to automatic holders.

F-6 GOGGLES

F-6a The goggles provided with the Fusion Bonding Unit shall protect the operator's eyes against side glare.

F-6b They shall be provided with means for protecting the coloured lenses with readily-replaceable clear cover plates capable of resisting pitting by sparks thrown during the operation of the process.

(See also C.S.A. Z94: Code for Head and Eye Protection)

G. MARKING

G-1 The transformer shall be marked with a serial number.

G-2 The unit shall be suitably labelled to clearly show the following:

- G-2a Manufacturer's Name and Address
- G-2b Type Number
- G-2c Serial Number
- G-2d Input Voltage
- G-2e Input Current at Rated Load
- G-2f Maximum Output Voltage
- G-2g Output Current Rating
- G-2h C.S.A. Approval Number.