

Brief Description about 40 kJ EMM System:

EMM System is the state of art technology for shaping and joining of metals based on the Electromagnetic Forming (EMF) and Electromagnetic Welding (EMW). These techniques are based on Lorentz force to achieve the required goal. The force is generated when a high voltage charged capacitor bank discharge through a forming/displacement coil placed in the proximity of work piece. The force developed is on account of interaction of induced current in the work piece with the magnetic field produced by the coil. In these techniques, forming and welding are achieved without physical contact between tool and job piece. Hence, it has obvious merits over conventional process such as brazing, welding, expansion, contraction, contour formation etc.

This sophisticated technique has many advantages such as precision, reproducibility, high production rate, no tool mark, minimization of manual error, automation ease etc. The preparatory procedures such as preheating, lubricating etc. are not needed. Since the bond is achieved by impact/pressure, this method is ideally suited for joining/welding of dissimilar metals with large difference in their melting points. This added advantage is generally not available in the conventional processes. This technique has applicable in automobile, electric, defence, aeronautical and other industries. It has tremendous potential for use in the manufacture of appliances and consumer products. For the sake of Convenience, The system is configured in to various Racks. Rack-1 consists of Capacitor Charging Power Supply, Programmable Logic Controller & dump resistor unit. Rack-2 comprises Discharge capacitor Bank and the working table consists EMM Tool. In addition, HMI and Oscilloscope is provided for system operation and recording waveforms. The following are the brief specifications:

| | |
|----------------------------|--|
| Energy | : 40kJ, 20kV |
| Capacitor Bank | : 4 Modules. Each module consists of 4 nos. of 14uF, 20kV Capacitors |
| Peak Short Circuit Current | : 350kA Max. |
| Capacitor Charging | : Resistive charging |
| Charging Time | : 90 sec. |
| Repetition Rate | : Min. one Discharge in every five minutes |
| Monitoring | : Module voltage : Shorts count : Discharge Current |
| Indication | : R Y B : H V ON : CHARGE ON : DUMP ON |
| Power Supply | : Input: 415V, 3 Phase, 50Hz, : Output: 0 to 30kVDC, 200mA |

40 KJ EMM SYSTEM



POWER SUPPLY & PLC RACK- FRONT DOOR



POWER SUPPLY & PLC RACK – FRONT VIEW



POWER SUPPLY & PLC RACK - REAR VIEW



CAPACITOR BANK RACK-FRONT DOOR



CAPACITOR BANK RACK -FRONT VIEW



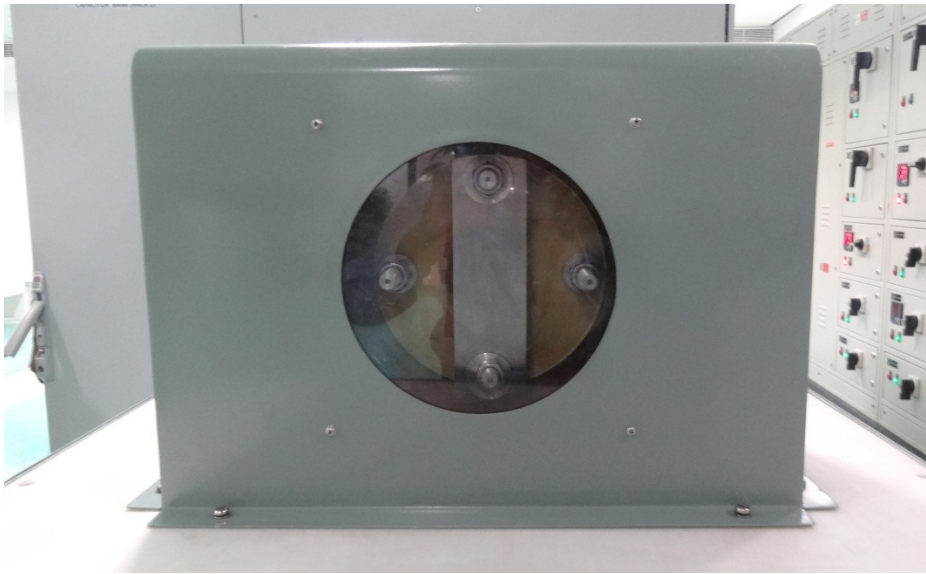
CONTROL CONSOLE



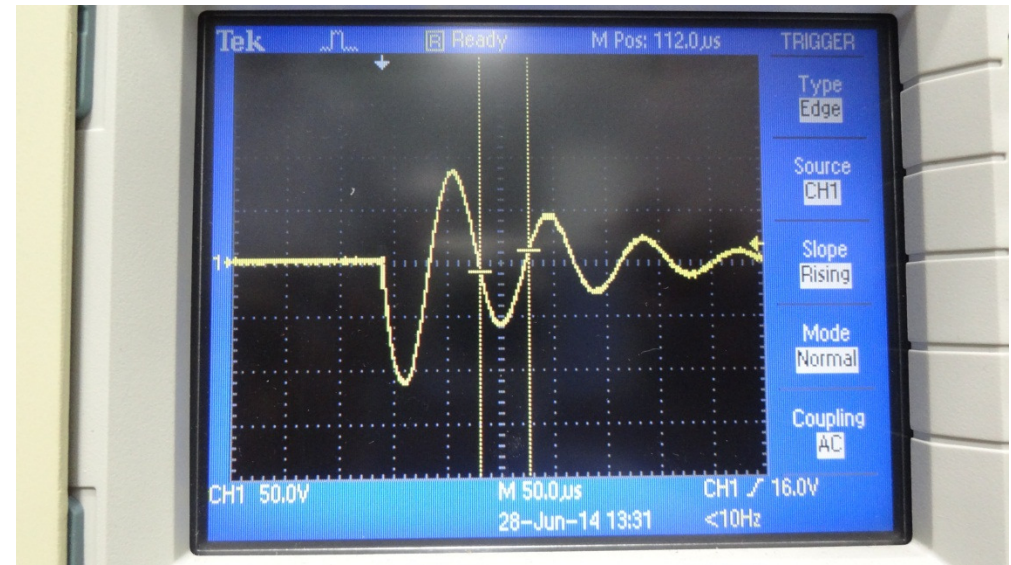
WORK TABLE



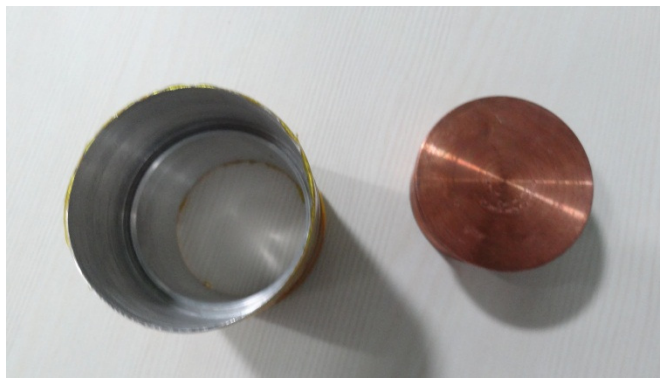
WORK TABLE PROTECTION COVER



OUTPUT CURRENT WAVEFORM



JOB PIECE BEFORE SHOT



JOB PIECE AFTER SHOT

