September 25, 2013

EQUIPMENT: LAB MODEL EPOXY CASTING M/C, CTI / SR / ECM / 09 – 13
SPEC No. : CTI / SR / ECM / 09 – 13

I. ABOUT THE EQUIPMENT, LAB MODEL EPOXY CASTING M/C, CTI / SR/ECM / 09 – 13:

The said equipment is visualized to be a "Laboratory Model Vacuum-assisted Epoxy Resin Mixing and Casting Machine", wherein commercial/laboratory or any other grades of "liquid-based epoxy resin material" would be mixed homogeneously with suitable "solid additive materials" under the application of vacuum at desired level (primarily to avoid bubble formation in the mix etc) in order to form so-called "additive-mixed resin liquid", after which the said "additive-mixed resin liquid" need to be casted into specimens using appropriate metallic (SS) mould/die (having pre-desired dimension/s etc) under vacuum in a manner that the formation of the bubbles in the casted specimens/components etc, during mixing & casting operation could be avoided. The casted specimens would finally need to be cured at a specified temperature having pre-determined time duration etc. at the curing temperature.

Hence, the equipment is visualized to essentially consist various components i.e., i) Mixing Chamber with Mixing Vessel (including required valves and pipelines etc), ii) Casting Chamber/vessel (including required valves and pipelines etc), iii) Vacuum Pumping System, iv) Control Panel, v) All required safety features, vi) Cleaning Arrangements (with solvents, thinner or any other cleaning liquid/s etc) & further vii) Integration with a Trolley (movable Trolley Type so that the whole equipment could be moved conveniently from one to another location in the plant, depending on various internal needs etc).

The design of the said equipment could vary from one to another supplier/fabricator/vendor, however the sole objective of the equipment as mentioned in the above & also in the subsequent sections must satisfy maintaining capacity/limit etc, unique features & all other criteria as well.

Any additional features that might be required to satisfy all the desired criteria could also be brought into, while submitting the offer.

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II. SCOPE OF WORK:

A. Mixing Chamber with Mixing Vessel (including required valves and pipelines etc)
B. Casting Chamber /Vessel (including required valves and pipelines etc)
C. Vacuum Pumping System
D. Control Panel
E. All desired Safety Features
F. Cleaning Arrangements (with solvents, thinner or any other cleaning liquid/s etc)
G. Integration with a Trolley (movable Trolley Type so that the machine becomes could be moved conveniently from one to another location in the plant, depending on various internal needs etc)

A. Mixing Chamber with Mixing Vessel (including required valves and pipelines etc):

(Purpose: To mix homogeneously (uniformly) the liquid-based epoxy resin and solid additive materials under vacuum for casting the mixed resin liquid):

1.	No. of mixing vessels	: Total 2 numbers with variable capacity one each and hence with variable dimension of container
	i) Capacity	: About 3 – 5 kg (one number)
	Dimension	: Suitable dimension for uniform and homogenous mixing
	ii) Capacity	: About 1 - 2 kg (one number)
	Dimension	: Suitable dimension for uniform and homogenous mixing
2.	Vacuum Level	: Up to 1 mbar
3.	Material of Construction	: Stainless Steel - SS304 Grade
4.	Tank Construction	: Cylindrical with conical bottom suitable for discharging
5.	Mix Motor	: About 0.25HP, Up to 50 RPM with variable speed
6.	Heating System	: Suitable Electrically heating system to be provided
7.	Vacuum Line	: The vacuum line with suitable pipe and ball valve for controlling the vacuum
8.	Vacuum Gauge	: 1 number high pressure digital type pirani gauge
9.	Vessel Construction	: Cylindrical with conical bottom
10.	Accelerator Port	:Suitable port to be provided on the top to pour the material
11.	Particle Filter	: Suitable particle filter to be provided to avoid the particles from entering the vacuum pump.
12.	Mix Pouring Valve	: Conical Teflon type or ~½ inch ball valve to be provided
13.	Mixing Blades	: Screw type blade or equivalent one number for each vessel to be provided
14.	Material of Mixing Blades	: SS 304
15.	Material Loading	: Trough top lid to be provided for loading manually

16. Temperature : Max temp.150°C ± 5°C with thermostat control
17. Insulation : To be provided about 40 – 50 mm thick thermal insulation glass wool packing with suitable aluminum cladding so that the skin (surface) temp remain in a comfortable level (maximum within 40°C)
18. Material transfer from Mixing vessel to casting Chamber : To be provided suitable valve to transfer the material

B. Casting Chamber /Vessel (including required valves and pipelines etc):

(Purpose: Casting of liquid-based epoxy resin composition under vacuum prior assembling the die/mould as per desired dimension)

1. Dimension : Aprrox. 500mm x 500mm x 500mm (L x B x H)
2. Platform Size : Approx. 400mm ∅
3. Platform arrangement : Rotating/movable pouring arrangement to be provided for casting multi-cavity die/mould
4. Material of Construction : Stainless Steel - SS304 Grade
5. Vacuum level : Up to 1mbar
6. Vacuum Gauge : 1 number high pressure digital type pirani gauge
7. Temperature : 150 ± 5 °C
8. Heating System : Suitable Electrically heating system to be provided
9. View Port : Suitable view port to be provided (1 no)
10. Light Port : Suitable light port to be provided (1 no)
11. Door Open/Close : Suitable door to be provided for easy operation
12. Insulation : To be provided 40 – 50 mm thick suitable thermal insulation glass wool packing with aluminum cladding so that skin temp (surface) remains in a comfortable level, about 40°C
13. Pouring Arrangements: A movable type of pouring arrangement to be provided for filling the liquid mix into multi-cavity die/mould

C. Vacuum Pumping System:

(Purpose: To create vacuum at the desired level in the chambers - the vacuum pumping system to be equipped with required Vacuum Pump, Condenser, Particle Filter and Valves & Pipe Lines etc)

1. **Vacuum Pump**

i)	Capacity	: About 100 lit / min
ii)	Motor Power	: About 1Hp
iii)	Quantity	: 1 number
iv)	Make	: Any reputed make

2. **Condenser Arrangement** : Suitable water cooled condenser system to be provided (cold water to be provided by us)

3. **Particle Filter** : Suitable particle filter to be provided with activated Carbon or similar material to safeguard the vacuum pump

4. **Valves & Pipe Lines** : To be provided wherever it is necessary in the machine

D. Control Panel : All controls for ON/OFF switches for vacuum pump, heaters, Mix motors etc., of standard make to be incorporated in the Control Panel. All contractors, relays etc should be reputed make

E. Safety Features : All the required safety features are to be provided and incorporated in the machine

F. Cleaning Arrangements : Suitable cleaning arrangement/s is to be provided for the mixing Vessel, Pouring Valves etc. using a variety of solvents / thinner etc

G. **Integrated with a Trolley** : The equipment need to be integrated with an appropriate trolley after which the whole equipment becomes movable, and hence the machine could be moved conveniently from one to another location in the plant, depending on various internal needs etc.

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