



**PHARMA DEVILS**

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

<b>EQUIPMENT ID. No.</b>	
<b>LOCATION</b>	<b>Sugar Melting Room</b>
<b>DATE OF QUALIFICATION</b>	
<b>SUPERSEDE PROTOCOL No.</b>	<b>NIL</b>



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**PROTOCOL CONTENTS**

<b>S.No.</b>	<b>TITLE</b>	<b>PAGE No.</b>
<b>1.0</b>	<b>Protocol approval</b>	<b>3</b>
<b>2.0</b>	<b>Objective</b>	<b>4</b>
<b>3.0</b>	<b>Scope</b>	<b>4</b>
<b>4.0</b>	<b>Responsibility</b>	<b>4</b>
<b>5.0</b>	<b>Equipment details</b>	<b>5</b>
<b>6.0</b>	<b>System description</b>	<b>5</b>
<b>7.0</b>	<b>Reason for qualification</b>	<b>6</b>
<b>8.0</b>	<b>Site of study</b>	<b>6</b>
<b>9.0</b>	<b>Frequency</b>	<b>6</b>
<b>10.0</b>	<b>Pre-qualification requirement</b>	<b>7</b>
<b>11.0</b>	<b>Tests &amp; checks</b>	<b>8</b>
<b>12.0</b>	<b>Check list for all test &amp; checks</b>	<b>11</b>
<b>13.0</b>	<b>References</b>	<b>11</b>
<b>14.0</b>	<b>Documents to be attached</b>	<b>11</b>
<b>15.0</b>	<b>Non compliance</b>	<b>11</b>
<b>16.0</b>	<b>Deviation from pre-defined specification, if any</b>	<b>11</b>
<b>17.0</b>	<b>Change control, if any</b>	<b>12</b>
<b>18.0</b>	<b>Abbreviations</b>	<b>12</b>



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**1.0 PROTOCOL APPROVAL:**

**PREPARED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
OFFICER/EXECUTIVE (QUALITY ASSURANCE)			

**REVIEWED BY:**

OPERATING MANAGER (QUALITY ASSURANCE)			
HEAD (QUALITY CONTROL)			
HEAD (ENGINEERING)			
HEAD (PRODUCTION)			

**APPROVED BY:**

DESIGNATION	NAME	SIGNATURE	DATE
HEAD (QUALITY ASSURANCE)			



**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**2.0 OBJECTIVE:**

- To carry out the Performance Qualification of Sugar Melting Tank used for manufacturing of liquid Preparation.
- To Provide Documented Verification that the Equipment as connected with ancillary system is suitable for indented purpose and produced product as per pre defined Acceptance Criteria

**3.0 SCOPE:**

- The scope of this qualification protocol is limited to qualification of Sugar Melting Tank Installed in **Sugar Melting Room**.

**4.0 RESPONSIBILITY:**

The Validation Group, comprising of a representative from each of the following departments shall be responsible for the overall compliance of this Protocol cum Report:

<b>DEPARTMENTS</b>	<b>RESPONSIBILITIES</b>
<b>Quality Assurance</b>	<ul style="list-style-type: none"><li>• Preparation, Review, and Authorization of Performance Qualification Protocol.</li><li>• Co-ordination with Production and Engineering to carryout Performance Qualification Activity..</li></ul>
<b>Production</b>	<ul style="list-style-type: none"><li>• Review &amp; Approval of Performance Qualification Protocol.</li><li>• To Co-ordinate and support for execution of Operational Qualification study as per Protocol.</li></ul>
<b>Quality Control</b>	<ul style="list-style-type: none"><li>• Review &amp; Pre Approval of Performance Qualification Protocol.</li><li>• Analytical Support (Microbiological Testing / Chemical Analysis)</li></ul>
<b>Engineering</b>	<ul style="list-style-type: none"><li>• Review &amp; Pre Approval of Performance Qualification Protocol.</li><li>• To co-ordinate and support Performance Qualification Activity.</li></ul>



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**5.0 EQUIPMENT DETAILS:**

<b>Equipment Name</b>	SS Jacketed Sugar Melting Tank
<b>ID. Number</b>	
<b>Capacity</b>	1000 Ltr.
<b>Gross Capacity</b>	1200 Ltr.
<b>Manufacturer's Name</b>	Bright Pharma Engineering Pvt. Ltd.
<b>Sr. No.</b>	
<b>Supplier's Name</b>	Bright Pharma Engineering Pvt. Ltd.
<b>Location of Installation</b>	Sugar Melting Area

**6.0 SYSTEM DESCRIPTION:**

Sugar Melting Tank Comprises of jacketed, insulated & cladded vessel having bottom entry low shear magnetic stirrer for stirring to perform heating & cooling with stirring operations respectively during the manufacturing process. The vessel will have CIP/SIP provision to clean the vessel respectively. All utility valves will be pneumatically operated & process valves pneumatic & manual operated to fulfill process requirements. Vessel will be supported by 3 legs. The full unit with operating panel & with drain header behind the vessel will be mounted on movable trolley. The vessel will also be facilitated with temperature sensor to online monitor the content's temperature. The operation of Sugar Melting Tank will be from touch screen (HMI) to operate in auto mode & semi -auto mode. The system will have online printing facility to take the printing by connecting Epson make dot matrix printer. This is principally designed for the sugar syrup preparation and manufacturing of liquid syrup. Sugar melting Tank is provided with all pipe fittings and valves with TC fittings and silicon gasket.

**7.0 REASON FOR QUALIFICATION:**

- New equipment installed in Sugar Melting Room.
- After completion of the Operation Qualification of the Equipments, it is imperative to perform the Performance Qualification. The study will establish that the parameters are followed, critical variables are under control and the quality of the output is, as desired.

**8.0 SITE OF STUDY:**

- Sugar Melting Room.



**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**9.0 FREQUENCY OF QUALIFICATION**

- After Every Two years as per Validation Master Plan.
- After any major breakdown or after major modification
- Relocation of Equipments.

**10.0 PRE – QUALIFICATION REQUIREMENTS:**

Verification for availability, completeness and approval status of all the required relevant documents shall be done and observations shall be recorded in the performance qualification report.

**10.1 Verification of Documents:**

Record the observations for documents in the below mentioned table.

S.No.	Document Name	Completed Yes/No	Checked By Engineering Sign/Date	Verified By QA Sign/Date
1.	Executed and approved Design Qualification cum report.			
2.	Executed and approved Installation Qualification cum report.			
3.	Executed and approved Operational Qualification cum report.			
4.	PQ Protocol approved.			
5.	SOP for Operation & Cleaning of Sugar Melting Tank.			
6.	SOP for Preventive Maintenance Sugar Melting Tank.			

**10.2 Training Record of Validation Team:**

- All the persons involved in the execution of qualification activity must be trained in all aspects of the qualification activity including the test methodology, acceptance criteria and safety precautions to be followed during working.
- Verify the training records and record the details in table mentioned in performance qualification report.

**10.3 Calibration of Test Instruments:**

- Calibration of all the instruments used for qualification should be mentioned along with Calibration Certificates.



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**11.0 TESTS & CHECKS:**

**11.1 Equipment Volumetric Capacity (In Liters) Test:**

**11.1.1 Objective:**

- The purpose of this test is to demonstrate that Vessel Capacity provided is as agreed with the Equipment supplier and meeting User Requirement (1200 liters total volume and 1000 liters maximum and 200 ltrs. Minimum Working Volume).

**11.1.2 Equipment / Instrument Used:**

- Process Water: Calibrated Vessel/ QC equipment to measure required quantity for charging of water.

**11.1.3 Method Applied:**

- Charge liters of Process Water using calibrated cylinder/ vessel. Witness the quantity of Water received by the vessel without overflowing. Operate the equipment at process parameters as per SOP on operation & cleaning of Sugar Melting Tank.
- Three consecutive trials must be tested as described before, in order to demonstrate Consistent performance.

**11.1.4 Acceptance Criteria:**

- Quantity of water charged shall not be less than quantity mentioned on Equipment Tag i.e. 1000 liter  $\pm$  0.3% (1999.5 to 1000.5 ltr.)
- Quantity of water charged shall not be less than quantity mentioned on Equipment Tag i.e. 200 liter  $\pm$  0.3% (499.5 to 501.5 Ltr.)

**11.1.5 Result Recording:**

- Measure the Equipment Volumetric Capacity (in liters) & calculate the result and record the results in Performance Qualification Report.



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**11.2 Verification Of Equipments Volumetric capacity By chemical assay Method:**

**11.2.1 Objective:**

- The purpose of this test is to ensure that Equipment Operates trouble free to prepare solution and solution prepared is homogeneous (without Lumps & clear solution) as seen visually and active contents are uniform.

**11.2.2 Equipment / Instruments Used:**

- Sodium Chloride & Purified water in sufficient quantity to make 1000 Ltr. Solution of 0.9 % NaCl.
- Sample collection using calibrated sampling rod.
- Sample containers

**11.2.3 Method Applied:**

- Charge 0.9% Nacl (Sodium chloride) in the Sugar Melting Tank along with Solvent. Stir the mixture for 15 minutes with minimum and maximum Speed.
- Perform Volumetric Capacity i.e. 200 Ltr. 400 Ltr. 600 Ltr., 800 Ltr And 1000 Ltr. Test with 0.9% Nacl with Different speed.
- Take one sample of 100 ml after each interval of capacity and speed for pH, Description and Assay of 0.9% Nacl. Sample to be taken after 15 minutes of mixing at Different Speed i.e. Minimum and Maximum
- Three consecutive trials must be tested as described before, in order to demonstrate Consistent performance.

**11.2.4 Acceptance Criteria:**

- The sample shall be free of lumps as seen visually
- Assay should be 0.882% W/V – 0.912% W/V
- The Equipment should operate trouble free throughout the operation cycle.

**11.2.5 Result Recording:**

- Record the results of in Performance Qualification Report record the details of the instruments used including its Calibration Status.





PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

### **11.3 Verification Of Uniformity Of Mixing:**

#### **11.3.1 Objective:**

- The purpose of this test is to ensure that Equipment Operates trouble free to prepare solution and solution prepared is homogeneous (without Lumps & clear solution) as seen visually and active contents are uniform.

#### **11.3.2 Equipment / Instruments Used:**

- Sodium Chloride & Purified water in sufficient quantity to make 1000 Liter. Solution of 0.9 % NaCl.
- Sample collection using calibrated sampling rod.
- Sample containers or sample bags.

#### **11.3.3 Method Applied:**

- Charge 0.9% NaCl (Sodium chloride) in the manufacturing vessel along with Solvent. Stir the mixture for 30 minute duration and Defined speed i.e. Min. and max.
- Take the Samples after 5, 10 & 30 minute time interval of mixing of cycle. Sample to be taken at two locations at identified potential areas of poor mixing. Sample to be taken at top and bottom. At different speed.
- Three consecutive trials must be tested as described before, in order to demonstrate Consistent performance.

#### **11.3.4 Acceptance Criteria:**

- At the 05 minutes, take the sample & observe visually .The sample shall be free of lumps as seen visually
- At the 10 & 30 minutes interval of cycle take the sample from SUGAR MELTING TANK & send the QC Lab for assay & pH.
- The test shall perform at Min and maximum Capacity of Tank.
- The Equipment should operate trouble free throughout the operation cycle.
- RSD should be NMT 2%.



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**11.3.5 Result Recording:**

- Record the results of in Performance Qualification Report record the details of the instruments used including its Calibration Status.

**12.0 CHECKLIST OF ALL TESTS & CHECKS**

S.No.	Name of Test or Check	Execution (Yes/No)	Remark
1.	Equipment Volumetric Capacity (in liters) Test		
2.	Equipment Volumetric Capacity (in liters) Test by chemical method		
3.	Verification of Uniformity of Mixing		

**13.0 REFERENCES:**

- Validation Master Plan.
- Schedule - M – “Good Manufacturing Practices and Requirements of Premises, Plant and Equipment for Pharmaceutical Products.”
- WHO Essential Drugs and Medicines Policy, QA of Pharmaceuticals, Vol-2. Good Manufacturing Practices and Inspection.
- SOP for “Operation & Cleaning of Sugar Melting Tank”.



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**14.0 DOCUMENTS TO BE ATTACHED:**

- Test Report from QC lab
- Any other Relevant Documents.
- Calibration Certificate of test Instruments.

**15.0 NON COMPLIANCE:**

- In case of any Non compliance observed during PQ, inform to Head QA for necessary action. Document the details observed.
- The Head QA will study the impact of Non compliance. If Non compliance is acceptable and it does not have an impact on performance of the Qualification, prepare final conclusion.

**16.0 DEVIATION FROM PRE-DEFINED SPECIFICATION, IF ANY**

- In case of any deviation observed during PQ, inform to Head QA for necessary action.
- Document the deviation detail in observed deviation section.
- The Head QA will study the impact of deviation. If deviation is acceptable and it does not have an Impact on performance of the Qualification, prepare final conclusion & prepare final conclusion.

**17.0 CHANGE CONTROL, IF ANY**

- If any change control is required during PQ, inform to Head QA for necessary action.
- Document the details observed.
- The Head QA will study the impact of change. If change is acceptable and it does not have an Impact on performance of the Qualification, prepare final conclusion & prepare final conclusion.



PHARMA DEVILS

**PERFORMANCE QUALIFICATION  
PROTOCOL  
FOR  
JACKETED SUGAR MELTING TANK**

**PROTOCOL No.:**

**18.0 ABBREVIATIONS:**

%	:	Percentage
cGMP	:	Current Good Manufacturing Practices
CQA	:	Corporate Quality Assurance
DQ	:	Design Qualification
ID.	:	Identification
IQ	:	Installation Qualification
Ltr.	:	Liter
RSD	:	Relatives Standard Deviation
LTD.	:	Limited
SMT	:	Sugar Melting Tank
Nacl	:	Sodium chloride
No.	:	Number
OQ	:	Operational Qualification
PPQ	:	Performance Qualification Protocol
PVT	:	Private
QC	:	Quality Control
S.S	:	Stainless Steel
SOP	:	Standard Operating Procedure
WHO	:	World Health Organization