

# Standard Operating Procedure

Title: Procedure for Cleaning Validation Coverage Testing

Department	Validation/Technical Services	Document no	VAL-230
Prepared by:		Date:	Supersedes:
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## 1. Purpose

This Standard Operating Procedure will define the procedure to be used to test the spray coverage of Clean-in-Place (CIP) Systems or Cleaning systems procedures designed for stainless steel vessels.

## 2. Scope

The test outlined in this procedure will demonstrate that all areas requiring cleaning are contacted by the cleaning solution during the cleaning cycle. This procedure will be utilised throughout the [manufacturing area](#) and will typically be conducted during OQ/PQ testing. Riboflavin or Methylene Blue solution can be used for the coverage testing.

## 3. Definitions

**Clean In Place (CIP):** Refers to systems utilizing either built-in self-cleaning capabilities or those that can be readily reconfigured for self-cleaning. CIP is usually accomplished through the use of pumps, spray balls/nozzles, and assorted accessory tanks for detergents and waste

**Riboflavin (Vitamin B<sub>12</sub>)** - an orange/yellow crystalline compound (C<sub>17</sub>H<sub>20</sub>N<sub>4</sub>O<sub>6</sub>). When prepared as a 0.001% w/v solution; riboflavin exhibits an intense yellowish green fluorescence.

**UV Light** - Ultraviolet Light.

**Methylene Blue** - At room temperature, this dye appears as a solid, odourless, dark green powder, that yields a blue solution when dissolved in water C<sub>16</sub>H<sub>18</sub>N<sub>3</sub>SCl.

## 4. Responsibilities

- 4.1 It is the responsibility of validation team to organise the coverage testing.
- 4.2 It is the responsibility of the Validation Supervisor/Manager or designee to ensure that validation personnel are properly trained on this SOP.

## 5. Procedure using Riboflavin

- 5.1 Obtain a general work permit form using the procedure described in SOP EHS-065 Hot Work Permit Procedure. Due to the necessity of tank entry, a confined space entry permit may also required. Ensure that electrical and service supplies to the process vessels are isolated using the procedure described in [SOP MAN-050 - Equipment tag out procedure](#).
- 5.2 Prepare a 0.001% w/v solution of Riboflavin in Water for Injection (WFI) and place into an appropriate spray bottle. Cover container with aluminium foil to protect from light, label with name, preparation and expiry date. Use the prepared solution within one month from the preparation date.
- 5.3 Enter the tank as per procedure and inspect the tank with the UV light and illustrate the hard to clean areas on the Tank diagram (Appendix A). At the end of the coverage testing particular attention must be paid to the hard to clean locations.
- 5.4 Using the spray bottle, cover all the product contact surfaces with the Riboflavin solution. Ensure that the surfaces are well covered by using a UV light. Particular attention must be paid to the hard to clean areas.

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- 7.9 Ensure that the electrical and service supplies to the process vessels are no longer isolated using the procedure described in SOP MAN-050 - Equipment tag out. Inspect the product contact surfaces with a telescopic mirror containing a light or a camera. The full tank should be absolutely free of dye.
- 7.10 Return the work permit(s) to EHS and ensure that electrical and service supplies to the process vessels are restored using the procedure described in SOP MAN-050 - Equipment tag out.
- 7.11 Document the test details and observation in the form Appendix B. If there is no blue colour visible then the CIP system is functioning effectively showing complete cleaning coverage. Any area showing visible traces of blue colour on the surface indicates hard to clean locations and that the vessel was not adequately cleaned. In this occasion contact the Validation Supervisor/Manager and raise deviation to investigate into the failure of the event.

### 8. Acceptance Criteria

- To demonstrate complete coverage, blue colour must be present on all surfaces prior the rinse cycle has been initiated.
- To demonstrate effective CIP system, no trace of Methylene blue should be present after the rinse cycle has been completed.

### 9. Related Documents

VAL-080	<a href="#">Validation Master Plan</a>
VAL-205	<a href="#">Management of Validation Protocols and Reports</a>
MAN-050	<a href="#">Equipment tag out Procedure</a>
EHS-065	<a href="#">Hot Work Permit Procedure</a>
Appendix A	<a href="#">Cleaning Validation Coverage Testing Form</a>
Appendix B	<a href="#">Cleaning Validation Coverage Testing using Methylene Blue Form</a>

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## Appendix B: Cleaning Validation Coverage Testing – using Methylene Blue

### 1. Equipment Details

Activity	Result	Verified by/date
Vessel ID #		
Previous batch manufactured	Batch ID#/date:	
Previous Clean completed and type of clean	Date/Type:	

### 2. Methylene Blue Preparation and rinse cycle

Methylene Blue Solution  
Batch Number: \_\_\_\_\_

Methylene Blue Solution  
Expiry Date: \_\_\_\_\_

Activity	By / Date	Verified by/date
Methylene Blue solution prepared		
Methylene Blue Rinse Cycle start		
Methylene Blue Rinse Cycle end		

### 3. Tank Assessment

Tank: \_\_\_\_\_

*Illustrate the hard to clean locations in the below diagram*

