MesaLabs

QS-503 Validation Summary v3
ProSpore Product Line

Executive Summary

The ProSpore manufacturing process is validated according to QS-501 *Validation Master Plan for the Mesa Labs, Inc., Bozeman Manufacturing Facility 625 Zoot Way*.

The ProSpore manufacturing process, under anticipated conditions, will consistently produce product that meets pre-determined specification requirements.

Process Performance Qualification

Process Performance Qualification (PPQ) conducted under Protocol #PQ161102P vB *Performance Qualification for the Manufacture of ProSpore*. This PPQ qualifies manufacturing of all ProSpore catalog numbers at 625 Zoot Way, Bozeman MT 59718. A list of catalog numbers validated under protocol #PQ161102P is attached to this summary document.

Validation Lots

77-02SPS5-100; log 5 100/box, Lot SPS-699
77-02-PS-6-50; log 6 50/box, Lot PS-679
77-02SPS5-100; log 5 100/box, Lot SPS-700

Rationale for selection of products

ProSpore manufacturing is a three-phase process: inoculation of media, ampoule filling/sealing and qualification. The inoculation phase consists of distributing a known quantity of bacteria into ProSpore media per LP-201. The inoculated media is dispensed into glass ampoules and flame sealed using liquid filling machines (LFM-101 and LFM-102). Once sealed, the ampoules are subjected to qualification testing consisting of population and steam resistance testing. The results are used to generate the label claim for each lot of ProSpore. Satisfactory completion of the qualification testing results in release of ProSpore for distribution.

A matrix approach was chosen for validation of the manufacturing process:

- The components used to manufacture these items are representative of the components used to manufacture all variants of the ProSpore.
- The organism, *Geobacillus stearothermophilus*, utilized for the validation lots represent the only organism used to manufacture ProSpore.
- Three runs were considered sufficient to simulate conditions that will be encountered during routine manufacturing, such as start-up, shut-downs, breaks, and manufacturing over multiple days.

As compared to the manufacturing process prior to transfer to the new facility, there were no changes to the manufacturing process, no changes to specifications, and no changes to components or component suppliers. Procedures were renumbered to align with the quality system, and a number of minor changes occurred to allow for slightly different workflow in the new facility; they otherwise remained unchanged.

Acceptance criteria and results

Three consecutively manufactured lots meeting the criteria provided below were required to confirm that the ProSpore manufacturing process, under anticipated conditions, will consistently produce product that meets pre-determined specification requirements.

For the QA final inspection per QSWI-103, the Acceptable Quality Level (AQL) for acceptability of a particular lot's inclusion in this qualification was based on criticality and frequency of the defect. If the lot in question fell within these established limits it was deemed acceptable for use as a validation lot. The defects were divided into two tiers. Defects considered *Critical to Performance* were assigned an AQL of 99%. Defects considered as having *No Impact to Performance* were assigned an AQL of 95%. Results are reported below for each validation lot.

77-02SPS5-100, Lot SPS-699		
Critical to Performance	**Results**	**Pass/Fail**
Population on assayed ampoule must be the targeted population log: Log5	$2.3x10^5$	PASS
Steam D-value must be within the range of 1.5-2.5minutes	2.0minutes	PASS
Labeling, specific to product traceability (species, lot number and expiration)	0 labeling errors	PASS
No Impact to Performance	**Results**	**Pass/Fail**
Position of print on box label	0 printing errors	PASS
Inclusion of C of A in package	0 packaged without a C of A	PASS
Quantity per box: 100pk box	Confirmed to be within acceptable range	PASS

77-02-PS-6-50, Lot PS-679		
Critical to Performance	**Results**	**Pass/Fail**
Population on assayed ampoule must be the targeted population log: Log6	$2.8x10^6$	PASS
Steam D-value must be within the range of 1.5-2.5minutes	2.1minutes	PASS
Labeling, specific to product traceability (species, lot number and expiration)	0 labeling errors	PASS
No Impact to Performance	**Results**	**Pass/Fail**
Position of print on box label	0 printing errors	PASS
Inclusion of C of A in package	0 packages without a C of A	PASS
Quantity per box: 50pk box	Confirmed to be within acceptable range	PASS

77-02SPS5-100, Lot SPS-700		
Critical to Performance	**Results**	**Pass/Fail**
Population on assayed ampoule must be the targeted population log: Log5	$2.1x10^5$	PASS
Steam D-value must be within the range of 1.5-2.5minutes	2.0minutes	PASS
Labeling, specific to product traceability (species, lot number and expiration)	0 labeling errors	PASS
No Impact to Performance	**Results**	**Pass/Fail**
Position of print on box label	0 printing errors	PASS
Inclusion of C of A in package	0 packages without a C of A	PASS
Quantity per box: 100pk box	Confirmed to be within acceptable range	PASS

Deviations to protocol

There were no deviations encountered during the execution of protocol PQ161102P vB.

Method Verification

The following Compendial Method Verifications were completed as part of this protocol:

- Population assay testing of liquid self-contained biological indicators per ISO 11138-1
- Steam resistance testing on liquid self-contained biological indicators per ISO 11138-3

Equipment Qualification

The following equipment qualifications were completed in order to execute this protocol:

Equipment Number	Equipment	Qualification document(s)	Protocol Deviations	Conclusion
KTL-101	Steam Kettle	KTL101-IOQ-101	None	The Steam Kettle has been installed successfully. The installation and operation qualification criteria have been met.
STZ-101	Steam Autoclave	STZ101-IOQ-001	None	The Steam Autoclave has been installed successfully. The installation, operation, and performance criteria have been met.
		STZ101-PQ-004	None	
LFM-101	Liquid Filling Machine	LFM101-IOQ-001	None	The Liquid Filling machine has been installed successfully. The installation and operation qualification criteria have been met.

Equipment Number	Equipment	Qualification document(s)	Protocol Deviations	Conclusion
LFM-102	Liquid Filling Machine	LFM102-IOQ-001	None	The Liquid Filling machine has been installed successfully. The installation and operation qualification criteria have been met.
RES-101	Steam Resistometer	RES101-IOQ-001	None	The steam resistometer has been installed successfully. The installation and operation qualification criteria have been met.
RES-103	Steam Resistometer	RES103-IOQ-001	D-001: the resistometer was only qualified up to 132°C instead of 135°C. No impact to PPQ protocol or product	The steam resistometer has been installed successfully. The installation and operation qualification criteria have been met.
INC-103	30-35°C Incubator	INC103-IOQ-001	None	The 30-35°C incubator has been installed successfully. The installation and operation qualification criteria have been met.
INC-105	55-60°C Incubator	INC105-IOQ-001	None	The 55-60°C incubator has been installed successfully. The installation and operation qualification criteria have been met.

Utility Qualification

The following utility qualifications were completed in order to execute this protocol:

System Number	Utility	Qualification document(s)	Protocol Deviations	Conclusion
AIR-101	Compressed Air System	AIR101-IOQ-001	None	The Compressed Air System has been installed successfully. The installation and operation qualification criteria have been met.
STM-101	Steam System	STM101-IOQ-001	None	The Steam System has been installed successfully. The installation and operation qualification criteria have been met.
WPU-101	RO/DI Water System	WPU101-IOQ-001	None	The RO/DI Water System has been installed successfully. The installation and operation qualification criteria have been met.
		WPU101-PQ-002	Six deviations, described below. No impact to protocol	The RO/DI water system meets acceptance criteria. Data confirmed that the system generates water that meets or exceeds Type II RO/DI water specifications

Deviations to WPU101-PQ-001:

- WPU-101-PQ-001-D-01 was opened to document that microbial data gathered before 11Jul2017 were determined to be invalid, as it was discovered that the filters used for testing were not sterile. No impact to the protocol; the required 30 business days of testing was completed.
- WPU101-PQ-001-D-02 was opened for using expired test strips to record the ozone levels. Data were invalidated. No impact to the protocol; the required 30 business days of testing were completed.
- WPU101-PQ-001-D-03 was opened for having a detectable level of ozone present in the water when ozone wasn't being generated. Data was invalidated. No impact to protocol; the reason ozone was detected was that Facilities had run the ozone cycle less than 90 minutes before the testing was performed.
- WPU101-PQ-001-D-04 was opened to document that the form used to record data for this study included an action limit for a sampling point before the RO tanks. No action limit should have been set, as this data was being gathered for information only, is not part of the RO system, and was not included in the performance qualification. No impact to the protocol, as all data required for the protocol were gathered and are reported.

- WPU101-PQ-001-D05 was opened to document that all microbial testing was performed at 10 Evergreen Drive instead of at 625 Zoot Way. No impact to protocol; testing was performed and documented according to procedures and forms identified in the protocol.
- WPU101-PQ-001-D-06 was opened to document that microbial samples were incubated at room temperature instead of in a 20-25°C incubator as specified in the protocol. No impact to protocol; room temperatures were confirmed to have remained within 20-25°C for the period of the study.

Standard Operating Procedures

The protocol was executed under the following standard operating procedures:

Document Number	Revision	Title
LP-203	3	Preparation of Proprietary Media for Product
LP-201	2	Manufacture of MagnaAmp, SterilAmp II and ProSpore
LP-302	2	Resistance Determination of Biological Indicators
LP-301	2	Population Assay of Biological Indicator Products
LP-404	1	Operation of Steam BIERs
LP-410	2	The ProSpore, MagnaAmp and ATSB Filling Machine
AP-201	3	Packaging of Product
AP-202	2	Inspection of Biological Indicators and Releasat Media Tubes
QSWI-103	1	QA Release of Finished Product Inventory

Training

The operators in the table below completed qualification training on the SOPs identified above during the PPQ.

Operator	Procedure(s)	Status of read-and-understand training on SOPs	Status of qualification training on SOPs
CV	LP-201, LP-203, LP-301, LP-302, LP-404, LP-410	Complete	Complete
MS	LP-201, LP-203, LP-301, LP-302, LP-404	Complete	Complete
NA	LP-301	Complete	Complete
EA	LP-201, LP-301, LP-302, LP-404	Complete	Complete
AS	LP-201, LP-301, LP-302, LP-404	Complete	Complete
NF	AP-201, AP-202	Complete	Complete
DG	AP-201, AP-202	Complete	Complete
RM	AP-201, AP-202	Complete	Complete
EA	AP-201, AP-202	Complete	Complete
LG	AP-201, AP-202	Complete	Complete
JS	AP-201, AP-202	Complete	Complete
JP	AP-201, AP-202	Complete	Complete
CB	LP-410	Complete	Complete

Approvals:

Validation: _____ Date: 25 JUN 2018
Kurt McCauley - Director of Support Services

Process Owner: _____ Date: 25 JUN 2018
Robert Bradley - Director of Production

QA: Janis E Smoke Date: 27 Jun 2018
Janis Smoke - Director of QA/RA

Document Change History

Revision	Changes	Reason for change
1	Original document	Original document
2	Protocol references changed to #161102P vB. Validation lot numbers and results revised. Operator training summary revised to include all operators who participated in manufacture of the lots included in this validation summary.	Process performance qualification performed under Protocol #161102P vA was invalidated. Justification for invalidation documented in ZT-IR-1804.
3	Corrected error in result table for lot SPS-700.	The results table for SPS-700 incorrectly stated it was lot SPS-696 in the header.