

Certificate of Analysis

Global Specifications for Lonza Biologics

Material Name: Adalimumab Bulk Substance Citrate Free (20,000 L)

AbbVie Article # (LU): 1M511A1A

Storage: - 80°C Nominal

AbbVie SAP #: 10083490

Production Date: 09-Feb-2019

Lonza Product #: 3660

Expiration Date: 08-Feb-2024

Batch #: 1000289384

Batch Disposition Date: 24-Apr-2019

Test Name	Method	Specification	Results
Appearance	QCA-574/ SGTS-8757	Liquid	Complies
Clarity	QCA-574/ SGTS-8757	≤ EP Reference Suspension IV	Complies
Color	QCA-574/ SGTS-8757	≤ EP Reference Solution B7	Complies
pH	QCG-055/ SGTS-1247	5.0 to 5.4	5.2
Osmolality	QCG-068/ SGTS-1236	288 mOsmol/kg to 330 mOsmol/kg	306 mOsmol/kg
A280	QCA-573/ SGTS-8759	100 mg/mL to 140 mg/mL	118 mg/mL
ELISA (Anti-TNF)	QCA-512/ SGTS-8762	75% to 125%	99%
Peptide Map	QCA-516/ SGTS-8764	The predominant chromatographic pattern conforms to that of the reference standard	Complies
Cation Exchange HPLC	QCA-503 / SGTS-8763	Relative Retention Time (RRT) of zero lysine variant peak of sample compared to reference standard is 0.9 to 1.1	1.0
		The predominant chromatographic pattern conforms to that of the reference standard	Complies
		Sum of Lysine Variants: ≥ 82%	85%
		First Acidic Region: ≤ 5%	3%
		Second Acidic Region: ≤ 13%	11%
Size Exclusion HPLC	QCA-504 / SGTS-8761	Peak Between Lysine 1 and Lysine 2 Variants: ≤ 2%	1%
		Difference in retention time of monomer peak in sample and reference standard is ≤ 2%	Complies
		Purity, Monomer ≥ 99%	>99%

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Test Name	Method	Specification	Results
Oligosaccharides	QCA-515/ SGTS-8769	Agalactosyl Fucosylated Biantennary Oligosaccharides: 70% to 81%	74%
		Fucosylated Biantennary Oligosaccharides: $\geq 85\%$	92%
		Galactose Containing Fucosylated Biantennary Oligosaccharides: 10% to 25%	19%
		Oligomannoses: $\leq 10\%$	8%
		Portion of NA1F form as a percentage of total Galactose Fucosylated Biantennary Oligosaccharides: $\geq 85\%$	93%
SDS PAGE Colloidal Blue Stain Reduced	QCA-513/ SGTS-8765	The predominant banding pattern conforms to that of the reference standard	Complies
SDS PAGE Colloidal Blue Stain Non-Reduced	QCA-513/ SGTS-8765	The predominant banding pattern conforms to that of the reference standard	Complies
		Limit $\geq 98\%$	> 98%
SDS PAGE Colloidal Blue Stain Reduced	QCA-576/ SGTS-8766	The predominant banding pattern conforms to that of the reference standard	Complies
		Limit $\geq 98\%$	>99%
SDS PAGE Colloidal Blue Stain Non-Reduced	QCA-576/ SGTS-8766	The predominant banding pattern conforms to that of the reference standard	Complies
		Limit $\geq 87\%$	92%
		Band: 2 Heavy Chains + 1 Light Chain $\leq 10\%$	5%

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Test Name	Method	Specification	Results
SDS PAGE Colloidal Blue Stain Non-Reduced	QCA-576/ SGTS-8766	Band: 2 Heavy Chains $\leq$ 4%	1%
		Band: > 200 kDa band(s) $\leq$ 2%	0%
		Band: 1 Heavy Chain + 1 Light Chain $\leq$ 2%	1%
		Band: 1 Heavy Chain $\leq$ 2%	<1%
		Band: 1 Light Chain $\leq$ 3%	1%
		Sum of Unidentified Extra Bands $\leq$ 2%	0%
Procathepsin L	QCA-510/ SGTS-8768	$\leq$ 5%	<2%
Endotoxin	QCM-109/ SGTS-8804	$\leq$ 0.2 EU/mg	<0.1 EU/mg
DNA	QCA-511/ SGTS-8767	< 1.25 pg/mg	<0.63 pg/mg
Bioburden	QCM-108/ SGTS-8758	$\leq$ 1 CFU/mL	0 CFU/mL
Host Cell Protein	QCA-514	$\leq$ 135 ng/mg	74 ng/mg

☒ **Meets Specifications**

☐ **Does Not Meet Specifications**

Comments: 20,000L Process

Reviewed By: Keyla Rodriguez
Keyla Rodriguez - TPM QA Manager

Date: 24-apr-19



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Revision History

Certificate of Analysis Revision Number: 1

Specification document number: RD-016

Specification document version number: 1.0

Certificate of analysis revision history: Initial CoA

Reason for Revision: _____
_____ N _____
_____ A _____

Prepared by: _____

Keyla Rodríguez - TPM QA Manager

Date: 24-apr-19



TO WHOM IT MAY CONCERN

We hereby confirm that the following analytical methodologies referenced in the CoA for adalimumab bulk substance citrate free (20,000 L), manufactured by Lonza Biologics Tuas PTE Ltd (LBT) 35 Tuas South Ave 6 Singapore 637377, correspond to Compendial Methods per the detail below:

Test	Internal reference method in Certificate of Analysis for adalimumab bulk substance citrate free (20,000 L)	Corresponding compendial test method
Clarity	QCA-574 / SGTS-8757	Ph. Eur. 2.2.1
Color	QCA-574 / SGTS-8757	Ph. Eur. 2.2.2
pH	QCG-055 / SGTS-1247	USP <791> Ph. Eur. 2.2.3
Osmolality	QCG-068 / SGTS-1236	Ph. Eur. 2.2.35
Endotoxin	QCM-109 / SGTS-8804	USP <85> Ph. Eur. 2.6.14 JP 4.01
Bioburden	QCM-108 / SGTS-8758	USP <61> / USP <62> Ph. Eur. 2.6.14 / 2.6.13 JP 4.05

Keyla Rodriguez 19-sep-19

Keyla Rodriguez

Associate Director, Product Quality