

Certificate of Calibration

General Information

Certification Number:	ASCC-UV-1681
Customer Name:	Takfam Sazan Teif Noor Co.
Instrument Model Number:	TEKSAN LENA DB-G100 Series
Instrument Lab Code:	LENA DB-G100
Calibration Date:	2021/11/02 (1400/08/11)
Calibration Due Date (Recommended by Customer):	2022/11/02 (1401/08/11)
Lab Temperature and Humidity:	- ° C, - %


Equipment used and Traceability

No	Descriptions	Manufacturer	Model	Cert. No.	Cal. Due Date
1	Holmium Oxide Filter	AZZOTA	USA	Q8083	2022/06/28
2	Didymium Oxide Filter	AZZOTA	USA	Q8083	2022/06/28
3	Neutral Density Glass Filter	AZZOTA	USA	Q8083	2022/06/28
4	Neutral Density Glass Filter	AZZOTA	USA	Q8083	2022/06/28
5	Neutral Density Glass Filter	AZZOTA	USA	Q8083	2022/06/28
6	Stray Light Filter (220nm)	AZZOTA	USA	Q8083	2022/06/28
7	Stray Light Filter (360nm)	AZZOTA	USA	Q8083	2022/06/28
8	Potassium Dichromate	Merck	Germany	1048640500	2023/09/30

Technical note and consideration

Calibration Method	ASL-I702-08-2;based on ASTM E925 and the other related national standards.
Traceability	The calibration is traceable to the SI through the referred measurement institutes.
Calibration Uncertainty	The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %.(based on EA/04-02).
Measurement condition	All measurement done in steady state of instrument include, source lamps and electronic circuit warmup at last 45 minutes.
Consideration	The calibration meets the requirements of ISO/IEC 17025
	Any copy of this certificate should be complete and include all pages.
	The user must recalibrate the instrument in specific periods.
	The calibration due shown above has been specified to us by this client. This certificate without hologram and stamp of issuing lab is not valid.

Confirmation

Accreditation Cert. Link	Lab manager	Calibration Expert	Lab Stamp
			

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System Information

System detail

Module name	Manufacturer	Type	Model/Ver.	Range/Year	Serial Number
Spectrophotometer	TEKSAN	Double Beam	DB-G100	200-800 nm	SPDUV04
Accessories	*	*	*	*	*
Software	TEKSAN	Tounesh	1.0.6.11	-	-

Abbreviations

Abbreviations

Abbreviation	Phrase or Word	Abbreviation	Phrase or Word
ASTM	American Society for Testing and Materials	RSD	Relative Standard Deviation
UV	Ultraviolet	AU	Absorption Unit
USP	United State Pharmacopeia	WL	Wavelength
Vis	Visible	Ave.	Average
STD	Standard	N/A	Not Applicable
SD	Standard Deviation	nm	Nanometer

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Wavelength Accuracy (Holmium Oxide)

Test Result		
Reference WL (nm)	Mean Detected WL (nm)	Accuracy (error in nm)
242.0	243.01	1.01
261.5	261.83	0.33
279.5	280.63	1.13
288.0	289.09	1.09
334.5	335.23	0.73
348.0	346.24	-1.76
361.0	362.07	1.07
386.0	387.23	1.23
419.0	419.19	0.19
446.5	446.65	0.15
454.0	454.04	0.04
460.5	460.37	-0.13
473.5	473.08	-0.42
485.0	485.16	0.16
537.0	537.11	0.11
638.0	637.55	-0.45
649.0	649.42	0.42
662.0	661.90	-0.10

Max Permissible Error: ± 1.0 nm (UV), ± 3.0 nm (Visible) Wavelength Uncertainty: ± 0.5 nm

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Wavelength Accuracy (Didymium Filter)

Test Result

Reference WL (nm)	Mean Detected WL (nm)	Accuracy (error in nm)
328.5	329.04	0.54
351.5	352.41	0.91
384.0	385.38	1.38
431.5	432.14	0.64
462.0	460.89	-1.11
473.5	473.29	-0.21
514.0	513.64	-0.36
530.0	530.52	0.52
573.0	572.29	-0.71
586.0	586.08	0.08
624.0	623.62	-0.38
630.0	629.82	-0.18
685.0	684.43	-0.57
739.5	739.12	-0.38
748.0	747.65	-0.35

Max Permissible Error: ± 1.0 nm (UV) ± 3.0 nm (Visible)

Wavelength Uncertainty: 0.5 nm

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Photometric Accuracy Check (UV region)

Test Result			
Measurement WL (nm)	Reference Value (AU)	Mean Measured Value (AU)	Error (AU)
235	0.2459	0.2523	0.0064
	0.4936	0.5062	0.0126
	0.7430	0.7492	0.0062
	0.9942	1.0228	0.0286
	1.2471	1.3376	0.0905
257	0.2861	0.2884	0.0023
	0.5744	0.5996	0.0252
	0.8650	0.8630	-0.0020
	1.1579	1.0691	-0.0888
	1.4529	1.1287	-0.3242
313	0.0964	0.1022	0.0058
	0.1930	0.2103	0.0173
	0.2898	0.3009	0.0111
	0.3868	0.4049	0.0181
	0.4842	0.5140	0.0298
350	0.2141	0.2072	-0.0069
	0.4286	0.4229	-0.0057
	0.6434	0.6255	-0.0179
	0.8586	0.8504	-0.0082
	1.0743	1.0424	-0.0319
Max Permissible Error: 0.012 AU		Absorbance Uncertainty: 0.0031 AU	

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Photometric Accuracy Check (Vis region)

Test Result			
Measurement WL (nm)	Reference Value (AU)	Mean Measured Value (AU)	Error (AU)
440	1.0057	1.0594	0.0537
	0.6970	0.7251	0.0281
	0.5158	0.5323	0.0165
465	0.9488	0.9990	0.0502
	0.6574	0.6868	0.0294
	0.4896	0.5084	0.0188
546	0.9978	1.0506	0.0528
	0.6904	0.7185	0.0281
	0.5243	0.5434	0.0191
590	1.1007	1.1567	0.0560
	0.7605	0.7864	0.0259
	0.5869	0.6415	0.0546
635	1.1118	1.2212	0.1094
	0.7678	0.8165	0.0487
	0.6091	0.6438	0.0347
Max Permissible Error: 0.008 Abs		Absorbance Uncertainty (Visible): 0.0031 AU	

UV/Vis Stray Light Test

Test Result	
Reference Wavelength (nm)	Stray light (T%)
220.0	2.4
360.0	2.5
Max Permissible Stray light value: 1.0 %T	