INFORME DE CALIBRACIÓN

Calibration Report

Reporte No. 14250

CARÁCTERÍSTICAS DEL INSTRUMENTO

Instrument Caracteristics

INSTRUMENTO: *Instrument*	POCKET COLORIMETRO
FABRICANTE: *Manufacturer*	HACH
MODELO / TIPO: *Model / Type*	POCKET COLORIMETRO II
EQUIPO S/N: *Equipment Serial*	11090E182869
IDENTIFICACIÓN: *Identificación*	NR
RESOLUCIÓN DEL EQUIPO: *Equipment Resolution*	(0,01 a 1) mg/L de ClO_2
RANGO DE MEDICIÓN: *Measurement Range*	(0,05 a 10) mg/l de ClO_2

DATOS DEL CLIENTE

Customer Data

EMPRESA: *Company*	Alcaldía Municipal de Cajicá
DIRECCIÓN: *Adress*	Calle 2 # 4-07
CIUDAD: *City*	Cajica, Cundinamarca

NÚMERO DE PAGINAS DE ESTE CERTIFICADO INCLUYENDO ANEXOS: **3**
Number of pages including this certificate and annex

FECHA DE RECEPCIÓN: *Date of Arrive*	2023-06-22
FECHA DE CALIBRACIÓN: *Date of Calibration*	2023-06-22
FECHA DE EMISIÓN: *Date of Issue*	2023-06-22

Los resultados de este certificado,se refieren al instrumento o equipo relacionado, al momento y condiciones en que se realizarón las mediciones.
Hach Colombia S.A.S. no se responsabiliza de los perjucios que pueda ocasionar el uso inadecuado de este instrumento.
Este certificado sólo puede ser reproducido en forma total o parcial con la debida autorización por escrito de Hach Colombia S.A.S.
Es responsabilidad del usuario enviar a calibrar el instrumento de medición dentro de los intervalos de tiempo apropiados.

The results of this certificate refer to related instrument or equipment, the moment and contitions in that the measurements were made.
Hach Colombia S.A.S. ot responsibility for damage ensuing of an inadequate manipulation of this instrument.
This certificate may only be reproduced as a whole or in part wich the written of Hach Colombia S.A.S.
The user is responsible for having the measuring instrument recalibrated at appropiate intervals.

Firmas Autorizadas

Authorized Signatures

Calibró:
Worked by



Luz Stella Rodríguez Vargas
Técnico en Mantenimiento
Maintenance technician

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TRAZABILIDAD

Traceabylity

Hach Colombia S.A.S. Garantiza que las mediciones son trazables a patrones nacionales o internacionales, en unidades de medida del sistema internacional (SI).

Hach Colombia S.A.S. ensures that the measurements made are traceable to national or international standards in units of measurement according to the International System of Units (SI)

MATERIAL DE REFERENCIA	PATRÓN	MARCA	LOTE	TRAZABILIDAD	FECHA DE VENCIMIENTO
	LR	HACH	A3040	HACH COMPANY	2026-02
	HR	HACH	A1350	HACH COMPANY	2024-06

MÉTODO

Method

Comparación Directa de las indicaciones dadas por el instrumento, contra el Material de Referencia (MR) según procedimiento interno.

Direct comparison of the indications given by the instrument against the Reference Material (MR) in acording to the internal procedure .

SITIO DE MEDICIÓN:
Mesuarement place

DEPARTAMENTO TÉCNICO - HACH COLOMBIA

CONDICIONES AMBIENTALES:
Ambient Conditions

Temperatura Inicial (°C):	19,0	**Temperatura Final (°C):**	19,0
Humedad Inicial (% HR):	49	**Humedad Final (% HR):**	49

RESULTADOS DE MEDIDA

Measurements results

DATOS DE CALIBRACIÓN:
Calibration Data

MATERIAL DE REFERENCIA	RANGO BAJO			RANGO ALTO		
	STD 1	STD 2	STD 3	STD 1	STD 2	STD 3
Valor Nominal (mg/L Cl)	**0,17**	**0,83**	**1,51**	**2,1**	**3,8**	**6,8**
Promedio Lecturas (mg/L Cl)	0,18	0,87	1,59	2,1	3,9	5,3
Error (mg/L Cl)	0,01	0,04	0,08	0,0	0,1	-1,5
Incertidumbre U Exp (mg/L Cl)	0,09	0,10	0,14	0,2	0,3	0,6

Nota: Las mediciones se realizan en concentraciones de Cloro. Los valores de Dioxido de Cloro (ClO_2) corresponden a 2,4 veces el promedio de las lecturas.

ANALISIS DE DATOS:
Data Analysis

Estándares Utilizados:	**6**
Coeficiente de Correlación (R^2):	1,000
Intersepto en y (b):	0,000
Pendiente (m):	1,052

INFORME DE CALIBRACIÓN

Calibration Report

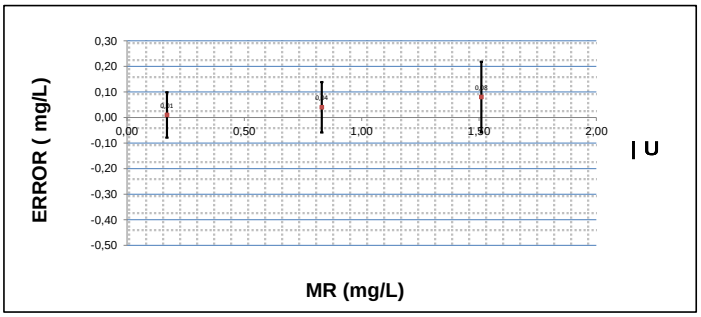
Reporte No. 14250

INCERTIDUMBRE DE MEDICIÓN

Measurement uncertainly

La incertidumbre estimada en el proceso de calibración (ver datos de calibración) se ha evaluado teniendo en cuenta la incertidumbre estándar combinada con las siguientes contribuciones: Desviación estándar, patrones y MR usados. Esta incertidumbre fue expandida por un factor de cobertura k = 2, para un nivel de confianza de aproximadamente el 95,45 %; siguiendo los lineamientos de la Guía GUM y del procedimiento interno

The estimated uncertainty calibration (see calibration data) has been evaluated considering the combined standard uncertainty with the following contributions: Standard deviation, patterns and MR used. This uncertainty was expanded by a cover factor K - 2, for a confidence level of approximately 95.45%, along the lines of the GUM Guide and internal procedure.



OBSERVACIONES : El equipo se encuentra operando correctamente.
Observations N.A. (No aplica) se muestra cuando el equipo no mide en rango alto.

MEDICIONES PRELIMINARES:

Preliminary measurements

DATOS PRELIMINARES						
VALOR NOMINAL (mg/L)	**STD 1 (LR)**	**STD 2 (LR)**	**STD 3 (LR)**	**STD 1 (HR)**	**STD 2 (HR)**	**STD 3 (HR)**
LECTURA DEL EQUIPO (mg/L)	0,18	0,86	1,59	2,1	3,9	5,3
ERROR (mg/L)	0,01	0,03	0,08	0,0	0,1	-1,5

FIN DEL CERTIFICADO

End of Certificate

Hach Company
100 Dayton Ave.
Ames, Iowa 50010

Certificate of Analysis

Product : DPD-Chlorine LR Spec Check Secondary Standards Kit

Product Number: **2635300** Lot Number: **A3040** Expiration Date: **Feb 2025**

Instrument (PRGM)	Blank A3040	STD 1 (mg/L) A3040	STD 2 (mg/L) A3040	STD 3 (mg/L) A3040
DR 6000 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 6000 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 5000 (80)	0.00	0.19 +/- 0.09	0.86 +/- 0.10	1.56 +/- 0.14
DR 5000 (85)	0.00	0.20 +/- 0.09	0.94 +/- 0.10	1.71 +/- 0.14
DR 4000 (1450)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 4000 (1460)	0.00	0.19 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 3900 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 3900 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 3800 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 3800 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 2800 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 2800 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 2700 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 2700 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 2500 (80)	0.00	0.19 +/- 0.09	0.90 +/- 0.10	1.63 +/- 0.14
DR 2500 (85)	0.00	0.19 +/- 0.09	0.90 +/- 0.10	1.63 +/- 0.14
DR 2400 (80)	0.00	0.19 +/- 0.09	0.90 +/- 0.10	1.63 +/- 0.14
DR 2400 (85)	0.00	0.19 +/- 0.09	0.90 +/- 0.10	1.63 +/- 0.14
DR 2010 (80)	0.00	0.19 +/- 0.09	0.88 +/- 0.10	1.60 +/- 0.14
DR 2010 (85)	0.00	0.20 +/- 0.09	0.93 +/- 0.10	1.69 +/- 0.14
DR 1900 (80)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14
DR 1900 (85)	0.00	0.20 +/- 0.09	0.91 +/- 0.10	1.66 +/- 0.14
DR 900 (80)	0.00	0.19 +/- 0.09	0.86 +/- 0.10	1.56 +/- 0.14
DR 900 (85)	0.00	0.19 +/- 0.09	0.86 +/- 0.10	1.56 +/- 0.14
DR 800 (9)	0.00	0.19 +/- 0.09	0.86 +/- 0.10	1.56 +/- 0.14
DR 800 (11)	0.00	0.19 +/- 0.09	0.86 +/- 0.10	1.56 +/- 0.14
DR 300	0.00	0.19 +/- 0.09	0.88 +/- 0.10	1.60 +/- 0.14
Pocket Color II (LR) (Kit PN 5870000)	0.00	0.19 +/- 0.09	0.90 +/- 0.10	1.63 +/- 0.14
Pocket Color (LR) (Kit PN 4670000)	0.00	0.18 +/- 0.09	0.83 +/- 0.10	1.51 +/- 0.14

NOTE: Choose the instrument and chlorine program being used. Transfer the control values to the enclosed certificate label and keep the label with your instrument for reference. For example, the test values for using a DR/2800 Spectrophotometer and stored program #80 would be 0.18, 0.83, and 1.51 mg/L chlorine for Standard 1, Standard 2, and Standard 3 respectively. File this Certificate of Analysis for safe keeping.

Certified by: _____ for and on the behalf of Hach Company.

Doc. Cat. No. 26353-87

Use of Chlorine Spec√ Standards

The Chlorine Spec√ Standards can now be used to verify instrument performance on all Hach Spectrophotometers and Colorimeters. These standards read directly as mg/L chlorine when used with Hach Company stored programs for Chlorine.

Secondary standards serve as a quality control check to verify that your instrument is operating correctly. The Spec√ standards are routinely used for two purposes. First, the standards confirm that the instrument response is within the tolerance range given on the Certificate of Analysis. Refer to the Certificate of Analysis to find the test values and the tolerance ranges that apply to the instrument model and stored program being used. The actual values determined should be recorded on the Record of Performance Verification included with the standards. These instrument performance values, when used together with results from any additional reagent and calibration verification tests required by your state or local regulatory agencies, form the basis for a thorough quality control program.

The second use of the standards is to verify that instrument performance has not changed from the initial performance evaluation. The standards are especially useful in verifying that instrument response has not changed during transportation of an instrument to the field or due to exposure of an instrument to extreme environmental conditions. The standards may also be used to confirm performance evaluations between analysts under lab and field conditions. Often times it is not feasible or practical to prepare and analyze chlorine standard solutions under these types of conditions.

The Spec√ standards are assigned chlorine equivalent test values by Hach Company at the time of manufacture. The test values are determined from the chlorine calibration curves stored in each Hach Company instrument. Test values are valid for two years from the date of manufacture.

Each instrument model responds or "sees" the gel standards differently as compared to the DPD chlorine chemistry color. Different responses from different instruments are due to differences in the optical systems, differences in the half-band width, and differences in the cell pathlength used for a specific stored program. These differences are expected. For example, we would not expect the Spec√standards to give the same value on a stored program that used a 1-inch square cell versus a stored program that was calibrated using a chlorine AccuVac; nor would we expect the response from a colorimeter to match the response from a spectrophotometer. Each test value listed is specific to the Hach Company instrument and chlorine program being used.

The Spec√ Chlorine Standards are just one part of the total testing package that Hach Company supplies for chlorine testing. Prepackaged DPD Chlorine Reagents calibrated and controlled specifically on Hach Company instruments along with simplified procedures, standard solutions and excellent technical support gives you, the customer, the best chlorine testing system available today.

2635300, 2893300, 2980500 Rev Y06-1ED AR310A

Hach Company
100 Dayton Ave.
Ames, Iowa 50010

Certificate of Analysis

Product : DPD-Chlorine HR Spec Check Secondary Standards Kit

Product Number: **2893300** Lot Number: **A1350** Expiration Date: **Jan 2024**

Instrument (PRGM)	Blank A2008	STD 1 (mg/L) A2007	STD 2 (mg/L) A2007	STD 3 (mg/L) A2007
DR 6000 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 5000 (88)	0.0	2.0 +/- 0.2	3.7 +/- 0.3	6.5 +/- 0.6
DR 4000 (1485)	0.0	2.0 +/- 0.2	3.8 +/- 0.3	6.6 +/- 0.6
DR 3900 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 3800 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 2800 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 2700 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 2500 (88)	0.0	1.9 +/- 0.2	3.6 +/- 0.3	6.4 +/- 0.6
DR 2400 (88)	0.0	1.9 +/- 0.2	3.6 +/- 0.3	6.4 +/- 0.6
DR 2010 (87)	0.0	2.0 +/- 0.2	3.7 +/- 0.3	6.5 +/- 0.6
DR 1900 (88)	0.0	1.9 +/- 0.2	3.4 +/- 0.3	6.1 +/- 0.6
DR 900 (88)	0.0	1.9 +/- 0.2	3.5 +/- 0.3	6.2 +/- 0.6
DR 800 (12)	0.0	1.9 +/- 0.2	3.5 +/- 0.3	6.2 +/- 0.6
DR 300	0.0	2.1 +/- 0.2	4.0 +/- 0.3	7.0 +/- 0.6
Pocket Color II (HR) (Kit PN 5870000) (Kit PN 5870023) (Kit PN 5870024)	0.0	2.1 +/- 0.2	3.8 +/- 0.3	6.8 +/- 0.6
Pocket Color II (Cl2/pH) (Kit PN 5870012)	0.0	2.1 +/- 0.2	3.8 +/- 0.3	6.8 +/- 0.6

NOTE: Choose the instrument and chlorine program being used. Transfer the control values to the enclosed certificate label and keep the label with your instrument for reference. For example, the test values for using a DR/2800 Spectrophotometer and stored program #88 would be 1.9, 3.4, and 6.1 mg/L chlorine for Standard 1, Standard 2, and Standard 3 respectively. File this Certificate of Analysis for safe keeping.

Certified by: _____ for and on the behalf of Hach Company.

Doc. Cat. No. 28933-87

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