coordinados.

Interventoría — Contratista.

13/09/2026

No se realizan actividades en la fecha.

Interventoría — Contratista.

14/09/2026

Actividades realizadas.

- Se realiza mesa de trabajo entre interventoría con su asesor eléctrico, contratista y la empresa Electromac, con la finalidad de evaluar los diseños eléctricos para el retranqueo de la red de Media y Alta tensión, entregados por el contratista el 21 de agosto de 2026. En donde se estableció como compromiso la entrega de la ingeniería de detalles junto a los cálculos mecánicos de la estructura de la red de alta tensión para evaluar las actividades no previstas y las cantidades de obra definidas por el Contratista en la Solicitud de adición presupuestal.
- El contratista presenta nuevamente el cronograma de obra ajustado, teniendo encuenta las observaciones presentadas por la interventoría vía correo electrónico del 09 de Septiembre de 2026.

Interventoría — Contratista.

15/09/2026.

Actividades realizadas.

- Se realiza comité de obra No. 19 en las instalaciones de Dinacol S.A. Con la participación de contratista, interventoría y supervisión de la Secretaría de Infraestructura Distrital, en donde se evalúo el avance de las actividades del proyecto, actualización de la gestión

Powered by CamScanner

predial, propuesta de la mejora en el diseño geometrico (extención de la "entrada de la carcel de tierra" hasta la carrera 86) y se revisa el cronograma de obra ajustado, presentado por el contratista.

- El Contratista realiza entrega de los diseños electricos y planos de retrongueo de los redes de Media y Alta Tensión, en cumplimiento del compromiso establecido en la mesa de trabajo del dia 14 de Septiembre de 2026.
- Se realiza instalación de estructura y elemento sobre los postes de concreto instalados en la Diagonal 32. (combugos), tales como:
  - Poste de concreto 02C (Estructura MT 123 simple): 1 cruceta tipo bandera de 2.40m, 1 diagonal de 7 FT y 2 aisladores hibridos tipo poste.
  - Poste de concreto 01C (estructura MT 321): 2 crucetas soportadas de 1.40 m y 2 aisladores de suspensión.
  - Poste de concreto 03C (Estructura MT 123 doble): 2 crucetas tipo bandera de 2.40m, 2 diagonales de 7 FT y 4 aisladores hibridos tipo poste.
  - Instalación de cable de aluminio 123.3 AAAC entre los postes de concreto 01C y 02C.
- NO se presentan lluvias en la Fecha.
- Personal que intervino en las actividades.
  - Oficiales Electricos 4

Interventoria

Contratista.

16/09/2026

Actividades realizadas.

- Se realiza mesa de trabajo entre interventoria y Contratista, en donde se verificaron las observaciones detectadas por la interventoria. para la corrección del cronograma de obra ajustado. Se acuerda presentar el cronograma de obra definitivo la proxima semana.
- Se realiza poda o ramajeo de arboles en la

Powered by CamScanner

Diagonal 32 para la instalación de cableado del poste 02C y 03C.
- No Saprsentan lluvias en la Fecha.
- Personal que intervino en la actividad.
  - ingeniero encargado Electromac 1
  - Oficiales electromac 5

Interventoria Contratista.

17

17/09/2026

Actividades realizados.
- Se Continua con el ramajeo de arboles en la Diagonal 32 para la instalación de cableado del poste 02C y 03C.
- No Se presentan LLuvios en la Fecha.
- personal que intervino en la actividad.
  - Oficiales Electromac 2.

Interventoria Contratista.

18/09/2026

Actividades realizados.
- Se realiza reunión entre la entidad Contratante, contratista, interventoria y entidades publicas, Con la Finalidad de evaluar el estado de la gestión predial y establecer Compromisos para la adquisición de los predios Faltantes.

Interventoria Contratista.

19/09/2026

No se presentan actividades en la Fecha.

Interventoria Contratista.

20/09/2026

NO Se presentan actividades en la Fecha. Interventoria Contratista.

Powered by CamScanner

21/09/2026

Actividades realizadas.

- Se realiza recorrido de obra para la definición de nuevas actividades relacionados con las instalaciones eléctricas, entre los que se destacan: Instalación de postes eléctricos sobre la troncal de occidente; Cajas eléctricas y bancos de ductos en el colegio Nuestra señora de Fátima; Ramaje de árboles y tendido de cable de aluminio 123.3 AAAC entre los postes de concreto 02C y 03C sobre la diagonal 32.
- El contratista solicita información de la revisión y la correspondiente aprobación del presupuesto y los planos de las redes de Media Tensión (MT) y Alta Tensión (AT), presentados como actividades adicionales del proyecto Intercambiador de Ternera.
- Se presentan fuertes lluvias entre las 12:00 hasta las 12:40.

Interventoría

Contratista

22/09/2026

Actividades realizadas.

- El contratista realiza entrega de las correcciones del cronograma de obra ajustado para el seguimiento y control del proyecto.
- La interventoría por medio de su asesor eléctrico realiza las siguientes observaciones de los diseños e ingeniería de detalle presentado el día 15 de septiembre de 2026, con referencia a las dimensiones de los postes metálicos de tipo secciones cónicas, autosoportados, pernados en la placa base, altura de 27 m para los tipo "A" (suspensión) y 21 m para las estructuras tipo "B" (retenciones), pero en las cantidades de obra del presupuesto, la solicitud de adición describe en el ítem 4.1.11 "suministro y montaje de poste metálico (27m - 35m) 9 Tom (Ppto. AT 5.1):
  - Se debe incluir las descripciones de los apoyos diseñados

Powered by CamScanner

en la Ingeniería de detalle las cantidades correspondientes.
- Se deben soportar con las cotizaciones los costos de estas descripciones.
- Se realiza mesa de trabajo entre las entidades contratante, contratista, interventoría y entidades publicos, con la finalidad de organizar la documentación de cada expediente predial y establecer compromiso para la adquisición de los predios faltantes.
- Se presentan lluvias moderadas entre los 12:05 hasta los 12:50.

Interventoría

Contratista.

23/09/2026

Actividades realizados.

- El contratista realiza el ramoneo en los especies arbóreos faltantes.
- Se continua con la instalación del cable de aluminio con referencia 123.3 AAAC entre los postes de concreto 02C y 03C sobre la diagonal 32.
- Se realiza Cargue y retiro a sitio autorizado del material vegetal sobrante.
- Se programa mesa tecnica con funcionarios del INPEC con el objetivo de revisar en campo las especificaciones tecnicas de los muros de cerramiento comprendidos en el area requerida por el proyecto, con el fin de cerrar el presupuesto de daño emergente y lucro cesante, para presentar una nueva oferta para la adquisición del predio. Esta se realizará el día 24 de septiembre de 2026 a los 9:00 asm.

Interventoría

Contratista.

24/09/2026

Actividades realizados.

- El contratista emite respuesta a los observaciones realizadas por el asesor de la Interventoría realizadas con los diseños e Ingeniería de detalles de los postes metalicos de

la red de Alta Tensión.
- El contratista avanza con reuniones de herederos y/o poseedores para lograr la entrega anticipada del predio y permiso de intervención.
- Se realiza mesa de trabajo entre contratista de obra e interventoría para el seguimiento del estado de adquisición de los predios faltantes para su posterior demolición.

Interventoría — Contratista.

25/09/2026

Actividades realizadas.
- Se realiza mesa de trabajo entre la entidad contratante, contratista, interventoría y entidades públicas, con la finalidad de evaluar el estado de la gestión predial y establecer compromisos para la adquisición de los predios faltantes.

Interventoría — Contratista.

26/09/2026

No se realizan actividades en la fecha.

Interventoría — Contratista

27/09/2026

No se realizan actividades en la fecha.

Interventoría — Contratista.

28/09/2026

Actividades realizadas.
- El contratista avanza en reuniones con herederos y/o poseedores para lograr la entrega anticipada del predio y permiso de intervención.

Powered by CamScanner

- El Contratista solicita cambio de profesional del proyecto, proponiendo a la señora Yennifer Arcia en reemplazo de la señora Katy Vitola.
- El Laboratorio EV Ingeniería S.A.S. emite el Informe No. 8 de resultados de resistencia a la compresión de los cilindros tomados del concreto empleado para la fabricación de los paneles texturizados.
- Se realiza mesa de trabajo entre profesionales del Contratista e Interventoría para revisión de documentos para reunión con los funcionarios del INPEC programada para el martes 29 de septiembre de 2026.

Interventoría Contratista

29/09/2026

Actividades realizadas.

- Se realiza mesa de trabajo entre la entidad contratante, Contratista, Interventoría y el INPEC donde se realizó Verificación de linderos con las coordenadas de las escrituras dando como resultado un ajuste a las medidas y áreas, iniciales presupuestadas.
- Se realiza revisión en campo y se verifico una propuesta de ingreso con el cual se llegó a un acuerdo con el INPEC. Se revisa con los peritos y se verifican medidas en campo.
- Se programa mesa de trabajo y nueva reunión para el día 06 de octubre de 2026 con funcionarios del INPEC para presentar la nueva oferta economica para la adquisición del área del predio.
- El contratista entrega informe final de revisión estructural a los diseño de los paneles de concreto texturizado S4 y M2, luego que se evidenciaran observaciones realizadas por el asesor estructural de la interventoría mediante el comunicado CIT-077-2026 del 03 de agosto de 2026.
- Se realiza reunión con los directivos de la policía Nacional

Powered by CamScanner

a cargo del colegio Nuestra Señora de Fátima, Con la finalidad de lograr permiso de intervención anticipada del predio para la ejecución de actividades de construcción de bancos de ductos y cajas eléctricas para el retrangueo de los redes eléctricos de Media Tensión que se encuentran en la troncal de occidente, entre los días 05 y 12 de octubre de 2026.

Interventoría Contratista.

30/09/2026

Actividades realizadas.

- Se realiza recorrido de obra en colegio Nuestra señora de Fátima con el personal técnico y operativo de la empresa ELECTROMAC para evaluar las actividades a realizar en el predio.
- Se realiza mesa de trabajo entre la entidad contratante, Contratista, interventoría y entidades públicas, con la finalidad de evaluar el estado de la gestión predial y establecer compromiso para la adquisición de los predios faltantes.
- Se programa reunión el día 03 de octubre de 2026 con el comandante de la policía Nacional de cartagena en donde se informará el alcance de la obra, el cronograma de obra, el Plan de manejo de tráfico (PMT) y los aspectos institucionales correspondientes, además de realizar un reconocimiento en sitio del área del predio intervenido.

Interventoría Contratista.

ANEXO 7

CONTROL DE CALIDAD DE OBRA Y CERTIFICACIÓN DE EQUIPOS.

CERTIFICADOS DE CALIDAD Y FICHASTÉCNICAS GEOMALLA

CONSORCIO INTERCAMBIADOR TERNERA

EMPRESA	DINACOL
ATENCIÓN	SINTIA GUERRERO
FECHA	25 DE AGOSTO DEL 2026

REMISIÓN DE SUMINISTRO DE MATERIALES

ITEM ID: ROLLS	UM	QTY	DESCRIPCIÓN
202	M2	20213	GEOMALLA 420R ROLLOS 1m X 100m
16	M2	1595	GEOMALLA 430R ROLLOS 1m X 100m
172	M2	8575	GEOMALLA 440R ROLLOS 1m X 50m
68	M2	3467	GEOMALLA 450R ROLLOS 1m X 50m
124	M2	6098	GEOMALLA 460R ROLLOS 1m X 50m
30	M2	1500	GEOMALLA 480R ROLLOS 1m X 50m

RECIBE	
EMPRESA	
TELEFONO	
FIRMA	

SE ENTREGAN 612 ROLLOS DE GEOMALLA

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H001
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 60
SIZE: 1M X 100M/ROLL
QUANTITY: 202 ROLLS / 20,200 M2

Parameter	Test Specimen Number									
	001	037	076	103	148	175	202			
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.21	2.19								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	62.9	63.1	62.8	62.9	63.3	63.4	63.1			
MD Elonglation @ Break (%)										
	10.5	11.0	10.6	9.6	10.7	10.9	9.8			
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	16.5	16.6	16.4	16.5	16.6	16.7	16.6			
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	31.5	31.6	31.7	31.6	31.8	31.7	31.5			
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00	1.00	1.00	1.00	1.01			
Roll Length (In-House Test Method)										
m	100.3	100.3	100.3	100.4	100.3	100.4	100.2			

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H002
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 70
SIZE: 1M X 100M/ROLL
QUANTITY: 16 ROLLS / 1,600 M2

Parameter	Test Specimen Number									
	001	007	015							
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.22	2.21								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	73.1	72.8	72.9							
MD Elonglation @ Break (%)										
	10.5	10.4	10.6							
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	20.5	20.6	20.4							
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	37.2	37.1	37.2							
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00							
Roll Length (In-House Test Method)										
m	100.3	100.3	100.2							

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H003
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 90
SIZE: 1M X 50M/ROLL
QUANTITY: 172 ROLLS / 8,600 M2

Parameter	Test Specimen Number									
	001	035	073	104	145	172				
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.21	2.23								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	92.8	93.2	92.9	92.9	93.4	93.1				
MD Elonglation @ Break (%)										
	10.4	10.3	10.6	9.6	10.6	10.1				
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	25.5	25.7	26.1	26.5	25.6	26.4				
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	48.5	48.6	48.7	49.1	48.8	48.7				
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00	1.00	1.00	1.01				
Roll Length (In-House Test Method)										
m	50.2	50.2	50.3	50.2	50.3	50.3				

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H004
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 120
SIZE: 1M X 50M/ROLL
QUANTITY: 68 ROLLS / 3,400 M2

Parameter	Test Specimen Number									
	001	022	047	068						
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.21	2.24								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	124.1	123.8	123.9	124.2						
MD Elonglation @ Break (%)										
	10.1	10.4	10.5	10.3						
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	35.5	35.6	35.4	35.5						
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	69.2	69.1	69.2	69.3						
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00	1.01						
Roll Length (In-House Test Method)										
m	50.2	50.2	50.2	50.3						

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H005
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 150
SIZE: 1M X 50M/ROLL
QUANTITY: 124 ROLLS / 6,200 M2

Parameter	Test Specimen Number									
	001	031	067	093	124					
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.22	2.20								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	153.8	153.6	154.1	155.2	153.4					
MD Elonglation @ Break (%)										
	10.4	10.3	10.2	9.9	10.3					
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	40.8	40.7	40.9	41.1	40.8					
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	79.5	79.6	79.7	80.2	79.8					
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00	1.00	1.00					
Roll Length (In-House Test Method)										
m	50.2	50.2	50.3	50.2	50.2					

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Zhongzhou (Shandong) Supply Chain Management Co.,Ltd
11/F, Building C, Zhongde Plaza, Rencheng District,
Jining City, Shandong, China

Factory Test Report

IMPORTER REF.: TERAX COLOMBIA S.A.S

Report No.: 260622H006
Date(s) tested: JUNE.22-23, 2026

Material: GEOGRID HDPE 180
SIZE: 1M X 50M/ROLL
QUANTITY: 30 ROLLS / 1,500 M2

Parameter	Test Specimen Number									
	001	011	023	030						
Polymer Indicator										
Polyethylene	Pass									
Carbon Black Content (ASTM D4218)										
%	2.22	2.24								
Peak Tensile Strength (ASTM D6637-A)										
kN/m (MD)	183.6	184.1	183.9	183.8						
MD Elonglation @ Break (%)										
	10.5	10.2	10.4	10.3						
Load at 2% Strain (ASTM D6637-A)										
kN/m (MD)	51.5	51.7	51.6	51.8						
Load at 5% Strain (ASTM D6637-A)										
kN/m (MD)	98.9	98.8	99.2	98.9						
Roll Width (In-House Test Method)										
m	1.01	1.00	1.00	1.01						
Roll Length (In-House Test Method)										
m	50.2	50.2	50.3	50.3						

Quality Audit: 王杨

Date: JUNE.23,2026

WANG YANG
QC Manager
Quality Control Department

Product Specification- E'GRID 420R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	59.0(4,043)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	16.2(1,110)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	30.4(2,083)
Junction Strength[3]	kN/m (lb/ft)	56.1(3,844)
Flexural Stiffness[4]	mg-cm	400,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	24.6(1,686)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.07
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 430R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	70.0(4,797)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	19.0(1,302)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	36.1(2,474)
Junction Strength[3]	kN/m (lb/ft)	66.5(4,557)
Flexural Stiffness[4]	mg-cm	680,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	29.7(2,035)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 440R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	87.0(5,962)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	24.7(1,693)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	47.5(3,255)
Junction Strength[3]	kN/m (lb/ft)	82.7(5,667)
Flexural Stiffness[4]	mg-cm	1,000,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	36.9(2,529)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 450R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	116.0(7,949)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	34.2(2,344)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	68.4(4,687)
Junction Strength[3]	kN/m (lb/ft)	110.2(7,552)
Flexural Stiffness[4]	mg-cm	2,800,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	49.3(3,378)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 460R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	144.0(9,868)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	39.9(2,734)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	77.9(5,338)
Junction Strength[3]	kN/m (lb/ft)	136.8(9,374)
Flexural Stiffness[4]	mg-cm	4,600,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	61.2(4,194)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 470R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	155.0(10,622)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	42.8(2,933)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	85.5(5,859)
Junction Strength[3]	kN/m (lb/ft)	147.3(10,094)
Flexural Stiffness[4]	mg-cm	6,800,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	65.9(4,516)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Product Specification- E'GRID 480R

Polymer: High Density Polyethylene

Resistance to Ultra-Violet Light: A high level of resistance to UV is given to E'GRID Geogrids by the incorporation of ≥2% of weathering-grade carbon black, well dispersed in the polymer matrix, to give extended lives in exposed conditions.

Creep Performance: Excellent creep performance under sustained loading is essential for the use of geogrids in critical structures such as walls, abutments and steep embankments.

BOSTD Geosynthetics Qingdao Ltd. maintains constant and ongoing Creep testing programs in its laboratories and works closely with National and International experts in determining appropriate creep reduction factors in accordance with ASTM D5262, NCMA and ISO TR 20432 requirements.

Dimensions and Delivery: The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 3.3 feet (1.0 meters) in width and 164 feet (50 meters) in length. On special request, the structural geogrid may also be custom manufactured to specific lengths or widths up to 4.3 feet (1.3 meters) to suit site specific engineering designs.

Product Properties		
Index Properties	**Units**	**MD Values[1]**
Tensile Strength [2]	kN/m (lb/ft)	175.0(11,992)
Tensile strength @ 2% strain [2]	kN/m (lb/ft)	48.5(3,324)
Tensile strength @ 5% strain [2]	kN/m (lb/ft)	95.0(6,510)
Junction Strength[3]	kN/m (lb/ft)	166.3(11,396)
Flexural Stiffness[4]	mg-cm	9,075,000
Durability		
Resistance to Long Term Degradation[5]	%	100
Resistance to UV Degradation[6]	%	100
Load Capacity		
Maximum Allowable Design Strength (Tallow) For 120 Year Design Life[7]	kN/m (lb/ft)	74.4(5,098)

Recommended Allowable Strength Reduction Factors[7]	
Minimum Reduction Factor for Installation Damage (RF_{ID})[8]	1.05
Reduction Factor for Creep for 120-year Design Life (RF_{CR})[9]	2.24
Minimum Reduction Factor for Durability (RF_D) [5]	1.00

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from BOSTD Geosynthetics Qingdao Ltd.
2. Measured in accordance with ASTM D6637 at 21±1℃.
3. Load transfer capability measured via ASTM D7737.
4. Resistance to bending measured via ASTM D7748, using specimens 2 apertures in width x at least 900mm long.
5. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.
6. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
7. Reduction factors are used to calculate the geogrid strength available for resisting force in long-term load bearing applications. Allowable Strength (T_{allow}) is determined by reducing the ultimate tensile strength (T_{ult}) by reduction factors for installation damage (RF_{ID}), creep (RF_{CR}) and chemical/biological durability ($RF_D = RF_{CD} \cdot RF_{BD}$) per GRI-GG4-05 [$T_{allow} = T_{ult}/(RF_{ID} \cdot RF_{CR} \cdot RF_D)$]. Recommended minimum reduction factors are based on product-specific testing. Project specifications, standard public agency specifications and/or design code requirements may require higher reduction factors. Design of the structure in which the geogrid is used, including the selection of appropriate reduction factors and design life, is the responsibility of the outside licensed professional engineer providing the sealed drawings for the project.
8. Minimum value is based on Installation Damage Testing in Sand, Silt, and Clay soils in accordance with ASTM D5818. Coarser soils require increased RF_{ID} values.
9. Reduction Factor for Creep determined for 120-year design life and in-soil temperature of 20°C using standard extrapolation techniques to creep rupture data obtained following the test procedure in ASTM D5262.

E'GRID is a Registered Trade Mark

BOSTD Geosynthetics Qingdao Ltd. Declares that all information is correct at the time of printing but reserves the right to make changes at any time.

BOSTD GEOSYNTHETICS

BOSTD Geosynthetics Qingdao Ltd.
Address: Qingda Industrial Zone, Chengyang District, Qingdao, Shandong, 266111, China
Tel: +86 10 82842590,91,92 Fax: +86 10 8284 2578
Email: export@bostd.com Website: www.bostd.com

CE 1213-21

GAI-LAP Initials: #86 Date: 2016

BOSTD GEOSYNTHETICS QINGDAO LTD.
QINGDA INDUSTRIAL ZONE CHENGYANG DISTRICT,QINGDAO,SHANDONG,CHINA 266111 CN

CERTIFICATE OF QUALITY

INV NO.: 241CO-T02 DATE:AUG 21, 2024
PO NO.: 1295

Name	E'GRID480R		Date	2024-08-16	Materials	HDPE
Product			Batch No.	24081402	Rolls	7000
Item		Unit	Specification	Test result	Test Method	
Tensile properties MD	Tensile Strength	kN/m	≥175	186.4	ASTM D6637	
	Strength at 2% strain	kN/m	≥48.5	53.9		
	Strength at 5% strain	kN/m	≥95	106.8		
	Strain at maximum load	%	11.0±3.0	9.5		
Carbon Black Content		%	≥2	2.2	ASTM D1603	
Result: Pass the tests						

For and on behalf of
青岛旭域土工材料股份有限公司
BOSTD GEOSYNTHETICS QINGDAO LTD.
Authorized Signature(s)

ISSUED BY: BOSTD GEOSYNTHETICS QINGDAO LTD.

BOSTD GEOSYNTHETICS QINGDAO LTD.
QINGDA INDUSTRIAL ZONE CHENGYANG DISTRICT,QINGDAO,SHANDONG,CHINA 266111 CN

CERTIFICATE OF QUALITY

INV NO.: 241CO-T02 DATE:AUG 21, 2024
PO NO.: 1295

Name	E'GRID480R		Date	2024-08-16	Materials	HDPE
Product			Batch No.	24081402	Rolls	7000
Item		Unit	Specification	Test result	Test Method	
Tensile properties MD	Tensile Strength	kN/m	≥175	186.4	ASTM D6637	
	Strength at 2% strain	kN/m	≥48.5	53.9		
	Strength at 5% strain	kN/m	≥95	106.8		
	Strain at maximum load	%	11.0±3.0	9.5		
Carbon Black Content		%	≥2	2.2	ASTM D1603	
Result: Pass the tests						

For and on behalf of
青岛旭域土工材料股份有限公司
BOSTD GEOSYNTHETICS QINGDAO LTD.
Authorized Signature(s)

ISSUED BY: BOSTD GEOSYNTHETICS QINGDAO LTD.

RESULTADOS DE RESISTENCIA A LA COMPRESIÓN DE CONCRETOS E.V. INGENIERÍA S.A.S.

CONSORCIO INTERCAMBIADOR TERNERA

EV INGENIERIA S.A.S

ENSAYO DE COMPRESION DE CILINDROS DE CONCRETO

CONTRATANTE : CONSORCIO INTERCAMBIADOR TERNERA

PROYECTO: CONSTRUCCIÓN DE INTERCAMBIADOR DE TERNERA

LOCALIZACION:

FECHA: SEPTIEMBRE 16 2026 **INFORME N°8**

CARACTERISTICAS DEL CILINDRO DE ENSAYO

DIAMETRO DEL CILINDRO : 6 pulg

ALTURA DEL CILINDRO 12 pulg

SECCION TRANSVERSAL : 28,27 pulg2

REFERENCIA DEL CILINDRO	ELEMENTO/ LOCALIZACION EN OBRA	FECHA (dd/mm/aa)		EDAD DEL CONCRETO (Dias)	CARGA DE ROTURA (lbs)	RESISTENCIA A COMPRESION	
		FUNDIDA	ENSAYO			lbs/pulg2	kg/cm2
C-1		6-jul-26	17-sep-26	73	165.680	5860	410,2
C-2		6-jul-26	17-sep-26	73	159.710	5649	395,4
C-3		6-jul-26	17-sep-26	73	161.943	5728	400,9
C-4		8-jul-26	17-sep-26	71	173.820	6148	430,3
C-5		8-jul-26	17-sep-26	71	171.530	6067	424,7
C-6		8-jul-26	17-sep-26	71	178.640	6318	442,3
C-7		8-jul-26	17-sep-26	71	188.840	6679	467,5
C-8		8-jul-26	17-sep-26	71	175.930	6222	435,6
C-9		8-jul-26	17-sep-26	71	174.876	6185	432,9
C-10		8-jul-26	17-sep-26	71	179.480	6348	444,3



CERTIFICADOS DE CALIBRACIÓN DE EQUIPOS TOPOGRÁFICO DE INTERVENTORÍA

CONSORCIO INTERCAMBIADOR TERNERA

TU EQUIPO S.A.S.
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

COTE 5325/26

CERTIFICACIÓN DE CALIBRACIÓN

LA ESTACIÓN FOIF REF. RTS102 - R10 S/N: AN01054

Fue revisado y verificado en nuestro laboratorio por personal experto, encontrándose en la actualidad, en perfecto estado de funcionamiento dentro de los parámetros mecánicos y ópticos establecidos por el fabricante.

Patrón de calibración ONAC Nivel FOIF DS05 de precisión 0.3mm S/N 618842 y certificado SENA NIV0225 DEL 09 de abril de 2025

Este instrumento fue evaluado y verificado utilizando colimador óptico FOIF Modelo TJ45X Serial No TJ45X-007 y prueba en campo.
NORMA TÉCNICA COLOMBIANA NTC-4522.PARTE 1.
NORMA TÉCNICA COLOMBIANA NTC-ISO/IEC17025.

Certificación expedida para
CONSORCIO INTERCAMBIADOR TERNERA NIT/C.C: 902.001.616-3

	DD	MM	AA
Día de verificación:	09	04	2026.
Recomendamos revisión:	08	10	2026.
Fecha de Expedición	09	04	2026.

Los resultados de este protocolo se refieren al momento y condiciones en que se realizaron las mediciones.

El transporte y uso del instrumento es responsabilidad exclusiva del cliente.

NOTA: Por favor confirme la autenticidad del presente certificado a los siguientes datos: contacto@tuequipo.co o teléfonos 3107820930 - 3138880300

TU EQUIPO S.A.S
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

Departamento técnico
Tu Equipo S.A.S.

TU EQUIPO S.A.S.
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

COTE 5325/26

CERTIFICACIÓN DE CALIBRACIÓN

LA ESTACIÓN FOIF REF. RTS102 - R10 S/N: AN01054

Lectura mínima en Display de 1"
ANGULO HORIZONTAL- TOLERANCIA: 2" DIN 18723
ANGULO VERTICAL- TOLERANCIA: 2''DIN 18723.

1 correcto funcionamiento 2 Falla corregida 3 No corregido
4 no verificado 5 No presenta este elemento

1	2	3	4	5	DESCRIPCIÓN
X					Limpieza de Óptica
X					Verticalidad y Horizontalidad del retículo.
X					Ajuste de cierres angulares.
X					Ajuste eje vertical.
X					Mando de enfoque.
X					Seguro de movimiento vertical.
X					Seguro de movimiento Horizontal.
X					Tornillo de movimiento fino Vertical.
X					Tornillo de movimiento fino Horizontal.
X					Compensador
X					Base nivelante.
X					Miras de puntería.
X					Verificación y ajuste de EDM, Línea base 138m
X					Ajuste de constantes
X					Display.
X					Teclado
X					Ajuste de plomada: láser x óptica
X					Ajuste de nivel tubular.
X					Ajuste de nivel circular.
X					Ajuste de niveles circulares de bastones porta prismas.
X					Cargador
X					Batería
X					Apariencia exterior, limpieza. Instrumento Ok.
X					Carga y Descarga de Datos

EQUIPO AJUSTADO Y CALIBRADO EN CALIDAD DE NUEVO

NOTA: Por favor confirme la autenticidad del presente certificado a los siguientes datos: contacto@tuequipo.co o teléfonos 3107820930 – 3138880300

TU EQUIPO S.A.S
NIT 900.533.022-4
WWW.TUEQUIPO.CO

Departamento técnico
Tu Equipo S.A.S.

Teléfonos: 313880300 Cel.: 310-7820930 Dirección: CALLE 73 # 71B 25
www.tuequipo.co - contacto@tuequipo.co
Bogotá – Colombia

TU EQUIPO S.A.S.
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

CV TE 05326/26

CERTIFICACIÓN DE VERIFICACIÓN

El NIVEL TOPOGRÁFICO FOIF Ref. FL32, NUMERO DE SERIE: FL00237
Tiene una tolerancia de +/- 1.0 mm por Km. doble de nivelación.
Óptica de 32X y rango compensador +/- 15'.

Fue revisado y verificado en nuestro laboratorio por personal experto, encontrándose en la actualidad, en perfecto estado de funcionamiento dentro de los parámetros mecánicos y ópticos establecidos por el fabricante.

Patrón de calibración ONAC Nivel FOIF DS05 de precisión 0.3mm S/N 618842 y certificado SENA NIV0225 DEL 09 de abril de 2025

Este instrumento fue evaluado y verificado utilizando colimador óptico FOIF modelo TJ45X Serial No TJ45X-007 y prueba en campo.
NORMA TÉCNICA COLOMBIANA NTC-4522.PARTE 1.
NORMA TÉCNICA COLOMBIANA NTC-ISO/IEC17025.

Certificación expedida para
CONSORCIO INTERCAMBIADOR TERNERA NIT/C.C: 902.001.616-3

	DD	MM	AA
Día de verificación:	09	04	2026.
Recomendamos revisión:	08	10	2026.
Fecha de Expedición	09	04	2026.

Los resultados de este protocolo se refieren al momento y condiciones en que se realizaron las mediciones.

El transporte y uso del instrumento es responsabilidad exclusiva del cliente.

NOTA: Por favor confirme la autenticidad del presente certificado a los siguientes datos: contacto@tuequipo.co o teléfonos 3107820930 - 3138880300

TU EQUIPO S.A.S
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

Departamento técnico
Tu Equipo S.A.S.

Teléfonos3138880300 Cel.: 310-7820930 Dirección: Cll 73 # 71b - 25
www.tuequipo.co - contacto@tuequipo.co
Bogotá – Colombia

TU EQUIPO S.A.S.
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

CV TE 05326/26

CERTIFICACIÓN DE VERIFICACIÓN

EI NIVEL TOPOGRÁFICO FOIF Ref. FL32, NUMERO DE SERIE: FL00237

Tiene una tolerancia de +/- 1.0 mm por Km. doble de nivelación.
Óptica de 32X y rango compensador +/- 15'.

1 Correcto funcionamiento 2 Falla corregida 3 No corregido
4 No verificado 5 No presenta este elemento

1	2	3	4	5	DESCRIPCIÓN
X					Limpieza de Óptica
X					Verticalidad y Horizontalidad del retículo.
X					Mando de enfoque.
X					Tornillo de movimiento fino Horizontal.
X					Compensador
X					Base nivelante.
X					Miras de puntería.
				X	Display.
X					Ajuste de nivel circular.
				X	Cargador y batería.
X					Apariencia exterior, limpieza. Instrumento Ok.
				X	Carga de Datos
				X	Descarga de Datos
X					Compensador Automático
X					Señal de horizonte

EQUIPO AJUSTADO Y CALIBRADO EN CALIDAD DE NUEVO

NOTA: Por favor confirme la autenticidad del presente certificado a los siguientes datos: contacto@tuequipo.co o teléfonos 3107820930 - 3138880300

TU EQUIPO S.A.S
NIT: 900.533.022-4
WWW.TUEQUIPO.CO

Departamento técnico
Tu Equipo S.A.S.

e Junio 2026

Bogotá D.C.
10 de Octubre 2024

No 0680

CERTIFICADO DE ÓPTIMO FUNCIONAMIENTO GNSS

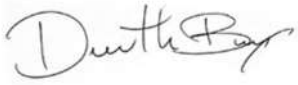
Por medio de la presente, CASA DEL TOPOGRAFO COLOMBIA S.A.S., NIT: 900.681833-4, en calidad de distribuidor exclusivo para la República de Colombia de los equipos de la línea de productos GNSS de la marca EFIX , CERTIFICA que el Sistema GNSS marca **EFIX** referencia **eBase / C5** cuyos receptores tienen número de serie **3821940 / 4147552** cumple con los parámetros del fabricante y se encuentra en el rango de precisión, referente a las características técnicas para este modelo de equipo y en óptimas condiciones de funcionamiento.

PARÁMETROS TÉCNICOS

Constelaciones de rastreo simultáneo	GPS, GLONASS, GALILEO, BDS, SBAS, QZSS
Precisión en medición estática	Hz: 2.5mm+0.5ppm Vt: 5mm+0.5ppm
Precisión en medición cinemática PPK	Hz: 3mm+1ppm RMS Vt: 5mm+1ppm RMS
Precisión en medición RTK	Hz: 8mm+1ppm Vt: 15mm+1ppm
Precisión GNSS de código diferencial	Hz: 40cm+1ppm Vt: 80cm+1ppm
Alcance de red RTK (vía CORS)	20 ~ 50Km.
Frecuencia UHF radio interna	430 ~ 470MHz con 1608 canales
Temperatura de trabajo	40°C ~ +65°C

Se realizan los procesos de pruebas y ajuste de acuerdo con los parámetros técnicos del fabricante en nuestros laboratorios por personal debidamente acreditado y autorizado, por lo cual se expide el presente certificado a solicitud del interesado, por una duración de un (1) años, tiempo normal óptimo, en donde al final del periodo se recomienda realizar un nuevo control de hardware y software del equipo.

Atentamente,



_____
DEIVYTH ALEJANDRO BURGOS
Técnico Casa Del Topógrafo Colombia S.A.S.

CERTIFICADO DE CALIBRACIÓN TERMÓMETRO PARA CONCRETO DE INTERVENTORÍA

CONSORCIO INTERCAMBIADOR TERNERA

ONAC ACREDITADO
ISO/IEC 17025:2017
19-LAC-011

LABCYS
Laboratorio de Calibración y Soporte Metrológico S.A.S

CERTIFICADO DE CALIBRACIÓN
CALIBRATION CERTIFICATE
LABORATORIO DE TEMPERATURA
TEMPERATURE LABORATORY

Numero de Certificado - *Certificate Number:* **CCLT-5300**

INSTRUMENTO - ***Instrument*** TERMOMETRO DIGITAL
FABRICANTE - ***Manufacturer*** WATERPROOK
RANGO DE MEDICIÓN - ***Measurement Range*** -50 °C A 300 °C
MODELO - ***Model*** TP101
NUMERO DE SERIE / ID** - ***Serial Number / ID A000010429 / SECTOR TERNERA - CARTAGENA

SOLICITANTE** - ***Customer CONSORCIO INTERCAMBIADOR TERNERA
DIRECCIÓN** - ***Address BOCAGRANDE CRA 3 # 8 - 6 / EDIFICIO MONTELIBANO OFICINA 302 - CARTAGENA
FECHA DE RECEPCIÓN - ***Arrive Date*** 2026-05-21
FECHA DE CALIBRACIÓN - ***Calibration Date*** 2026-05-21

NUMERO DE PAGINAS DEL CERTIFICADO INCLUYENDO ANEXOS - ***Number of pages of this certificate and documents attached*** 2

MÉTODO DE CALIBRACIÓN - ***Calibration Method***

El método empleado en la calibración del instrumento bajo prueba es comparación directa, el cual consiste en comparar las lecturas del termómetro patrón con las lecturas de un termometro bajo prueba de acuerdo a lo establecido en la norma NT-VVS-103:1994 Thermometers, Contact, Direct Reading: Calibration.

TRAZABILIDAD DE LA MEDICIÓN - ***Traceability***

Los patrones utilizados en la calibración de este instrumento están trazados al sistema internacional de unidades a través de patrones nacionales de la magnitud respectiva. Para este caso se emplearon los siguientes:

Instrumento Patrón	Identificación	Certificado de Calibración - Trazabilidad
TERMOMETRO	LB-50	IM-TEM-25-0472 DE INGOBAR DEL 2025-09-12
BLOQUE SECO	LB-45	IM-ISO-25-0286 DE INGOBAR DEL 2025-08-22
BAÑO LIQUIDO	LB-46	IM-ISO-25-0287 DE INGOBAR DEL 2025-08-21 / 22

DESCRIPCIÓN DEL INSTRUMENTO - *Description of the instrument*

En buen estado para su calibración

***Intervalo Calibrado:** -10 °C a 200 °C **Escala Indicada:** 0,1 °C

CONDICIONES AMBIENTALES - *Environmental conditions*

Temperatura mínima del aire durante la calibración: 18,9 °C **y máxima de:** 20,2 °C
Humedad mínima del aire durante la calibración: 42,8 %hr **y máxima de:** 49,6 %hr

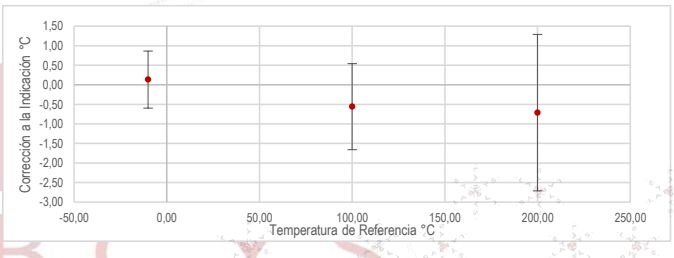
El instrumento fue calibrado en las instalaciones de LABCYS S. A. S. en Calle 8 c No. 78 - 90, Bogotá D. C.

INCERTIDUMBRE DE MEDICIÓN - *Measurement uncertainty*

La incertidumbre expandida de la medición reportada se establece como la incertidumbre estándar de medición multiplicada por el factor de cobertura "k" y la probabilidad de cobertura, la cual debe ser aproximada al 95% y no menor a este valor. Las incertidumbres de medición fueron estimadas de acuerdo con el documento: JGCM 100:2008. GUM 1995 con correcciones menores. Evaluación de los datos de medición – Guide to the Expression of the Uncertainty in Measurement.")

RESULTADOS DE LA CALIBRACIÓN - *Results of calibration*

*Punto de Calibración °C	Temperatura de Referencia °C	Indicación del Instrumento °C	Corrección a la Indicación °C	Incertidumbre °C	k
-10,0	-10,067	-10,2	0,1	0,7	1,65
100,0	100,041	100,6	-0,6	1,1	1,97
200,0	199,988	200,7	-0,7	2,0	1,96
#¡VALOR!	#N/D				
#¡VALOR!	#N/D				
#¡VALOR!	#N/D				
#¡VALOR!	#N/D				



Los valores de la tabla son el promedio de las mediciones realizadas. Temperatura Corregida = Indicación del Instrumento + Corrección a la indicación

OBSERVACIONES - *Additional information*

Ingrese a la pagina https://labcyscert.com para la validación de este certificado.

*Ubicación : SECTOR TERNERA - CARTAGENA

Profundidad de inmersión del sensor durante el proceso de calibración de 100 mm

La conversión de unidades se realiza de acuerdo al documento NIST SP 811 Guide for the use of the International System of Units (SI) - 2008

Se adjunta estampilla de calibración No. 5300

Este certificado es emitido de conformidad con ISO/IEC 17025:2017 y documenta la trazabilidad de las mediciones al Sistema Internacional de Unidades - SI, a tráves de National Institute of Standars and Technology - NIST, Physikalish-Technische Bundesanstalt - PTB u otros institutos nacionales de metrología - INM que son miembros del CIPM Mutual Recognition Arrangement. El usuario está obligado a calibrar el instrumento a intervalos apropiados. - This certificate is issued in compliance whit ISO/IEC 17025:2017and documents the treceability of measurements to the International System of Units - SI throught the National Institute of Standars and Technology - NIST, Physikalish-Technische Bundesanstalt - PTB or other National Institutes of Metrology - NMI signatories to the CIPM Mutual Recognition Arrangement. The user is obliged to have the object calibrated at appropiate intervals.

Este certificado de calibración no puede ser reproducido parcialmente, excepto con autorización del laboratorio que lo emite. Los certificados de calibración sin firma y / o sin código de verificación QR no son válidos. - This calibration certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without a signature and / or a QR verification code are not valid.

Los resultados de este certificado solo están relacionados con los objetos calibrados. El laboratorio no se responsabiliza por los perjuicios que puedan derivarse del uso inadecuado de los objetos calibrados o de este certificado o de la información suministrada por el cliente (indicada con " * ").- The results of this certificate just are related with the calibrated objetcs. The laboratory does not take responsibility from the inadequate use of the calibrated objects or this certificate or the information provided by the client (marked with " * ").

CALIBRADO POR	AUTORIZADO POR	FECHA DE EMISIÓN	QR DE VERIFICACIÓN
Calibrated by	*Authorized by*	*Issued Date*	
Tnlgo. Diego Andres Franco M.			
Dir. Técnico	Tnlgo. Jhon Fredy Calderón D.	2026-05-22	
	Metrólogo		

FIN DEL CERTIFICADO DE CALIBRACIÓN - *End of Calibration Certificate*

LABORATORIO DE CALIBRACIÓN Y SOPORTE METROLÓGICO S.A.S.
comercial@labcyssas.com - directortecnico@labcyssas.com
311 2122566 - 316 5302942
Calle 8c No. 78-90, Bogotá D.C.

LABCYS
Laboratorio de Calibración y Soporte Metrológico S.A.S