



Concepto de la Varilla de Fibra de Vidrio



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Certificaciones



REGISTRATION NO. Q1-2661

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

TOTAL ROD CONCEPTS, INC.
2800 S County Road 1207
Midland, TX

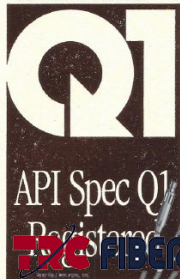
has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Specification Q1

The scope of this registration and the approved quality management system applies to the:

Manufacture of Fiberglass Sucker Rods for the Oil and Gas Industry

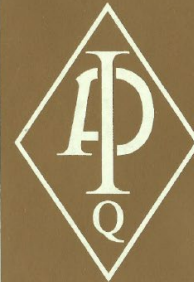
API approves the organization's justification for excluding:
Servicing; Validation of Processes; Customer Property



Effective Date: **MARCH 31, 2018**
Expiration Date: **MARCH 31, 2021**
Registered Since: **MARCH 31, 2015**

Monty D. Dine
Executive Vice President

This certificate is valid for the period specified herein. The registered organization must continually meet requirements of API Spec Q1, Specification for Quality Programs for the Petroleum, Petrochemical and Natural Gas Industry, and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. This certificate has been issued from API offices located at 1220 L Street, N.W., Washington, D.C. 20005-4070, U.S.A. It is the property of API, and must be returned upon request. To verify the authenticity of this certificate, go to www.api.org/compositelist.



American Petroleum Institute



Certificate of Authority to use the Official API Monogram

License Number: **11B-0153**

ORIGINAL

The American Petroleum Institute hereby grants to

TOTAL ROD CONCEPTS, INC.
2800 S County Road 1207
Midland, TX

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API-11B** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: **11B-0153**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: FRP Sucker Rods

QMS Exclusions: Servicing; Validation of Processes; Customer Property

Effective Date: **MARCH 31, 2018**
Expiration Date: **MARCH 31, 2021**

To verify the authenticity of this license, go to www.api.org/compositelist.

Monty D. Dine
Executive Vice President



Certificate of Registration

APIQR® REGISTRATION NUMBER
2785

This certifies that the quality management system of

TOTAL ROD CONCEPTS, INC.
2800 S County Road 1207
Midland, TX

has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and found it to be in conformance with the following standard:

ISO 9001:2015

The scope of this registration and the approved quality management system applies to the
Manufacture of Fiberglass Sucker Rods for the Oil and Gas Industry

APIQR® approves the organization's justification for excluding:
8.5.1(f) Validation and Periodic Revalidation of Processes; 8.5.3 Property Belonging to Customers or External Providers

Effective Date: **SEPTEMBER 25, 2018**
Expiration Date: **MARCH 31, 2021**
Registered Since: **SEPTEMBER 25, 2018**

Monty D. Dine
Executive Vice President



This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of APIQR's Registration Program and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001 standard requirements may be obtained by consulting the registered organization. This certificate has been issued from APIQR offices located at 1220 L Street, N.W., Washington, D.C. 20005-4070, U.S.A. It is the property of APIQR, and must be returned upon request. To verify the authenticity of this certificate, go to www.api.org/compositelist.



Origen de la Varilla de Fibra de Vidrio

► Concepto Original

- Fiberglass 1^{er} usada en pozo de agua 1958
- Fiberflex® entro al mercado en 1978, 1^{era} instalada en 1979
- Como Resistencia a la Corrosión
- Concepto vendido como una alianza con Amoco

► Fiberflex fue Pionera en

- 1^{er} Diseño Exitoso del End Fitting
- Adaptación al Proceso de Protrusion
 - Alta Resistencia a la Tracción
- Reconocimiento de API a la Fibra de Vidrio (1986)

Especificaciones API 11B de las Varillas de Fibra de Vidrio

► ¿Qué cubre?

- Diseño y desarrollo
- Requisitos dimensionales
- Dimensiones y tolerancias especificadas para los extremos de los pasadores
- Dimensiones del accesorio final (Tabla D.1)
- Composición química
- Propiedades mecánicas
- Temperaturas de funcionamiento
- Diagrama de rango de tensión
- Clasificación máxima de tracción y peso de la varilla
- Inspección y prueba
- Pruebas de prueba
- Embalaje
- Almacenamiento
- Calificación
- Realizar pedidos

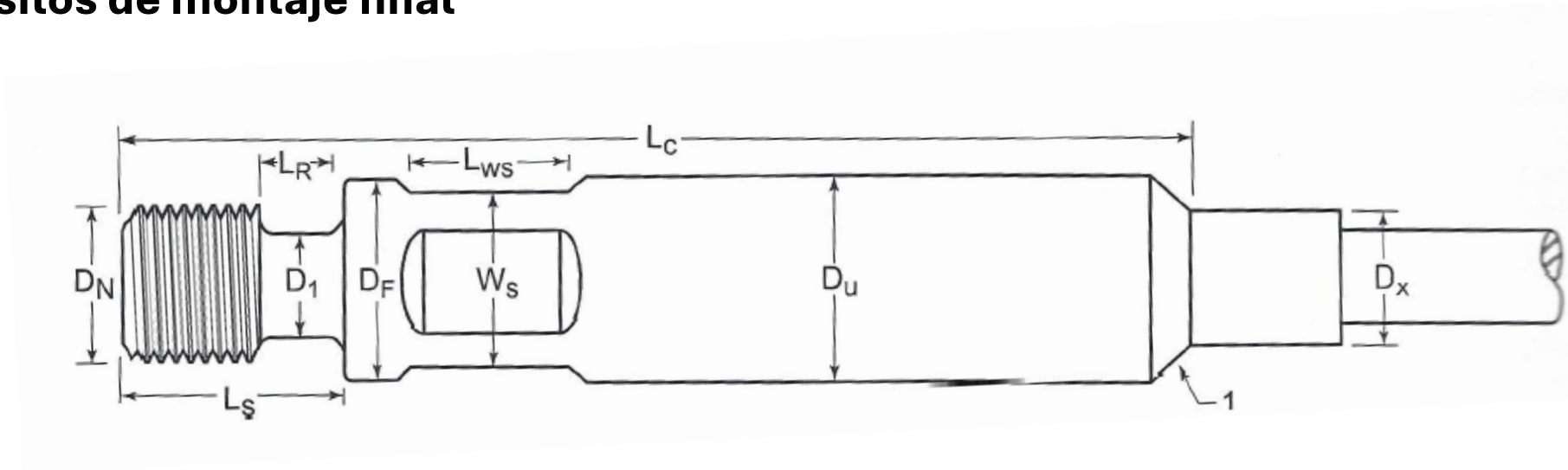




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Requerimientos de Calidad para la Varilla de Fibra de Vidrio

► Requisitos de montaje final





FIBERFLEX[®]

TRC
Total Rod Concepts, Inc.

Ventajas diseño con Fibra de Vidrio comparado con otros diseños



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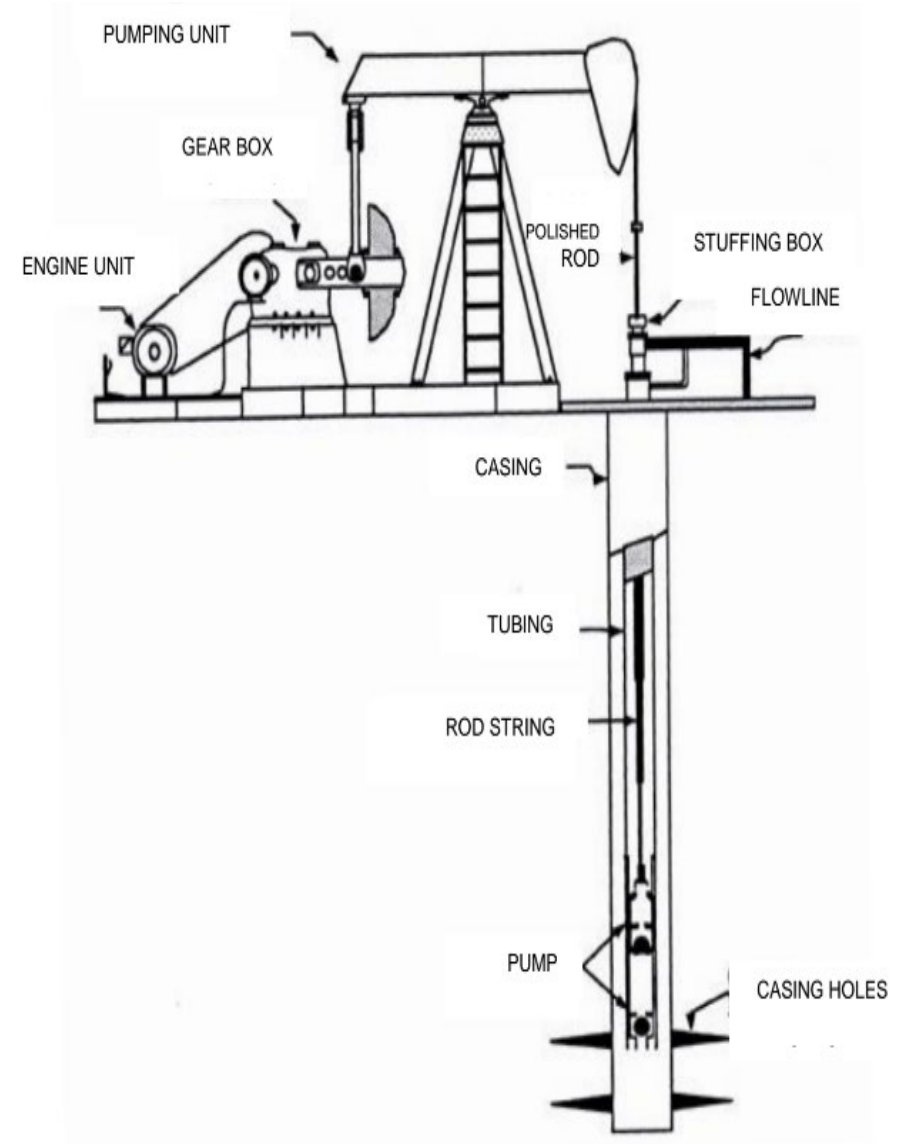


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Ventajas de la Fibra de Vidrio

► Beneficios Principales

- 70% Más liviana que la varilla de acero
- Módulo de Elasticidad (Sobre-Viaje “Carrera”)
- Costo Eléctrico
- Reducción del peso de la Sarta
- Rango de operación a mayores profundidades (peso de menor sarta)
- Costo de Mantenimiento Reducido
- Unidades de Superficie requeridas menor tamaño
- Mayor fluido por golpe (stroke)
- Menor costo de Producción por Barril



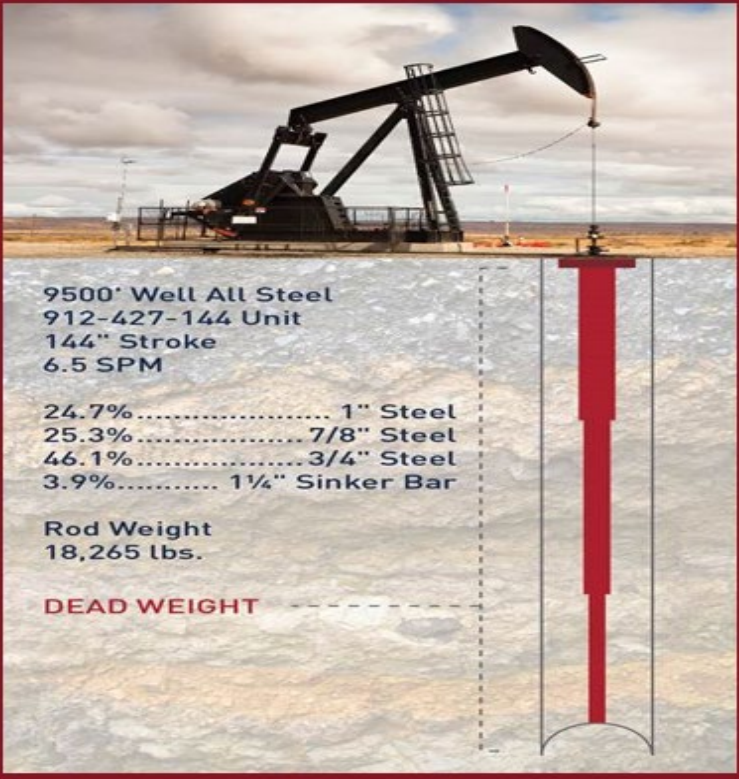


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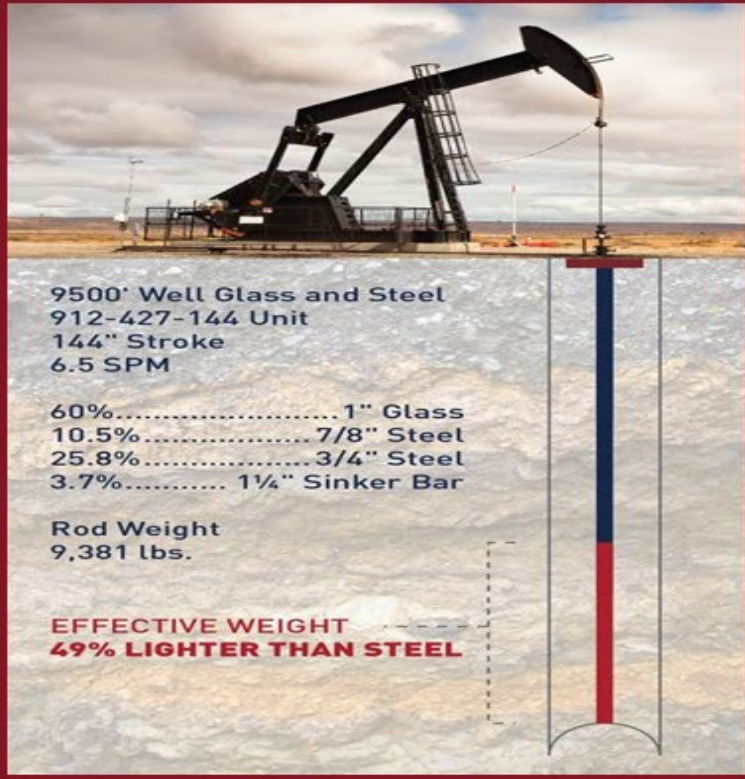
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Comparación de los productos

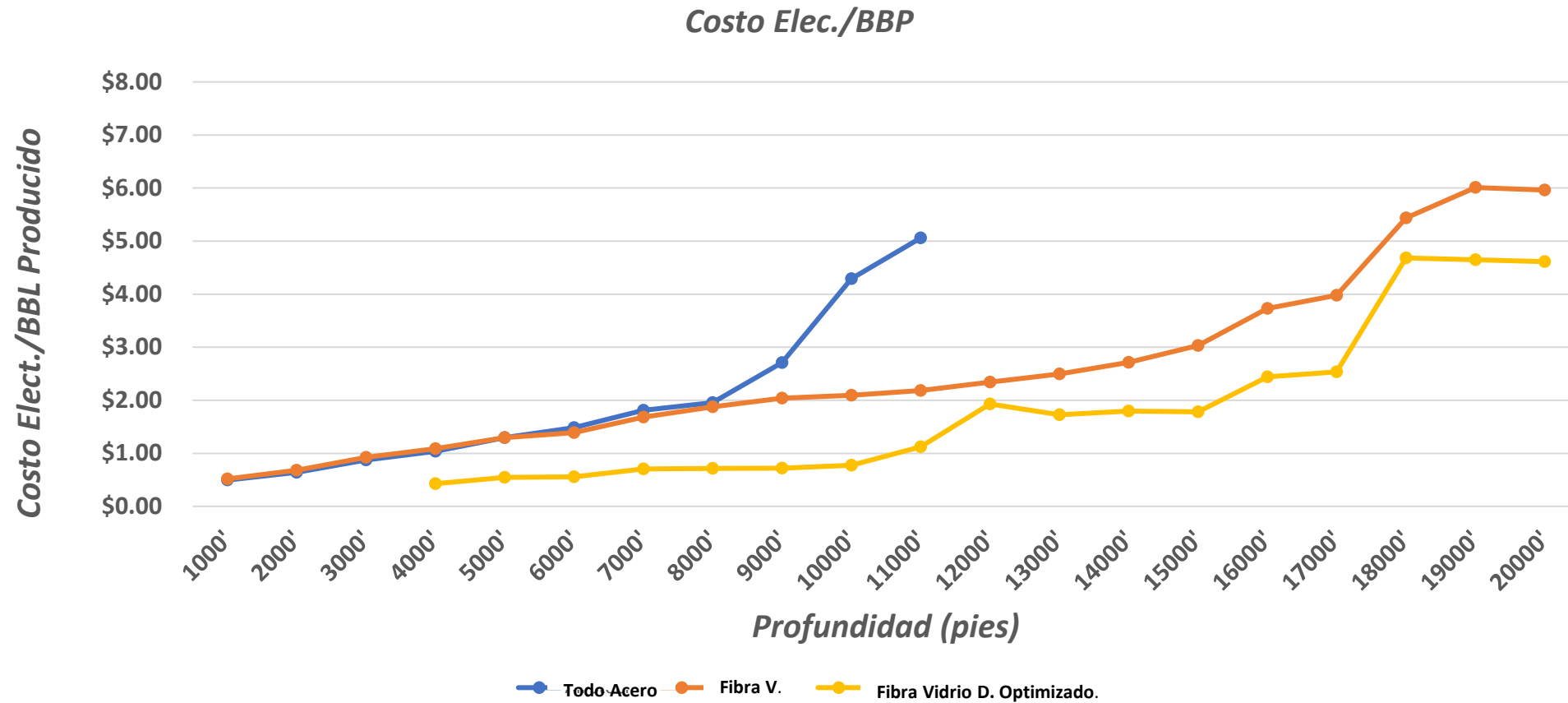
All Steel String



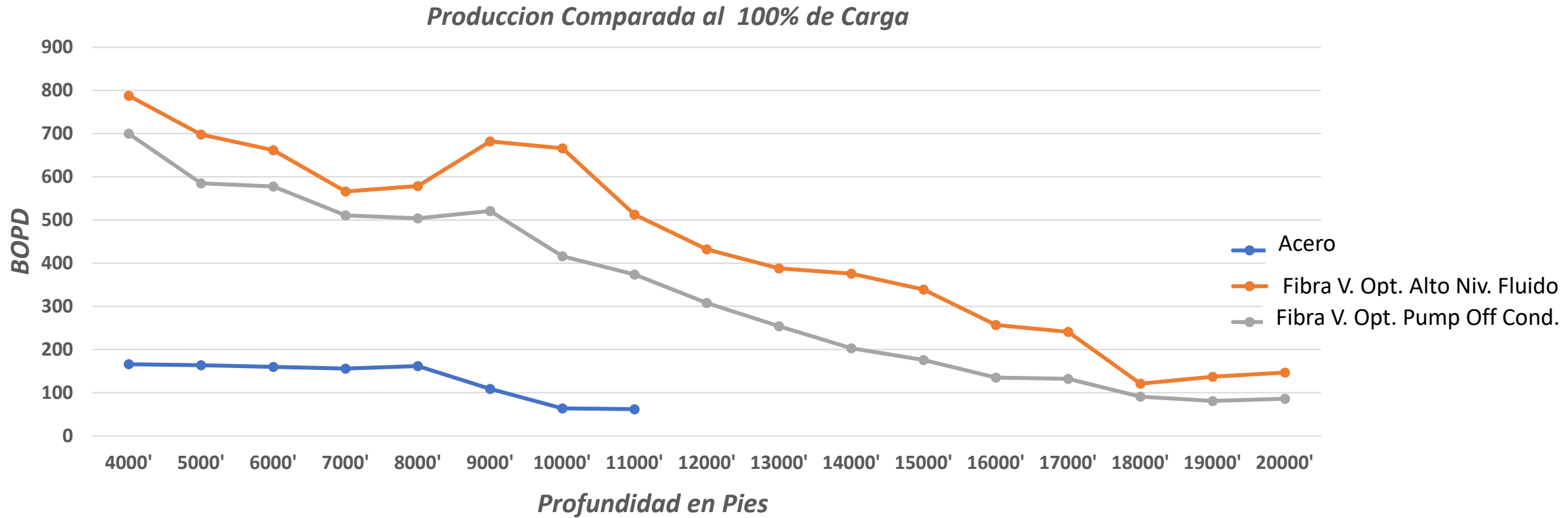
Fiberflex® Fiberglass



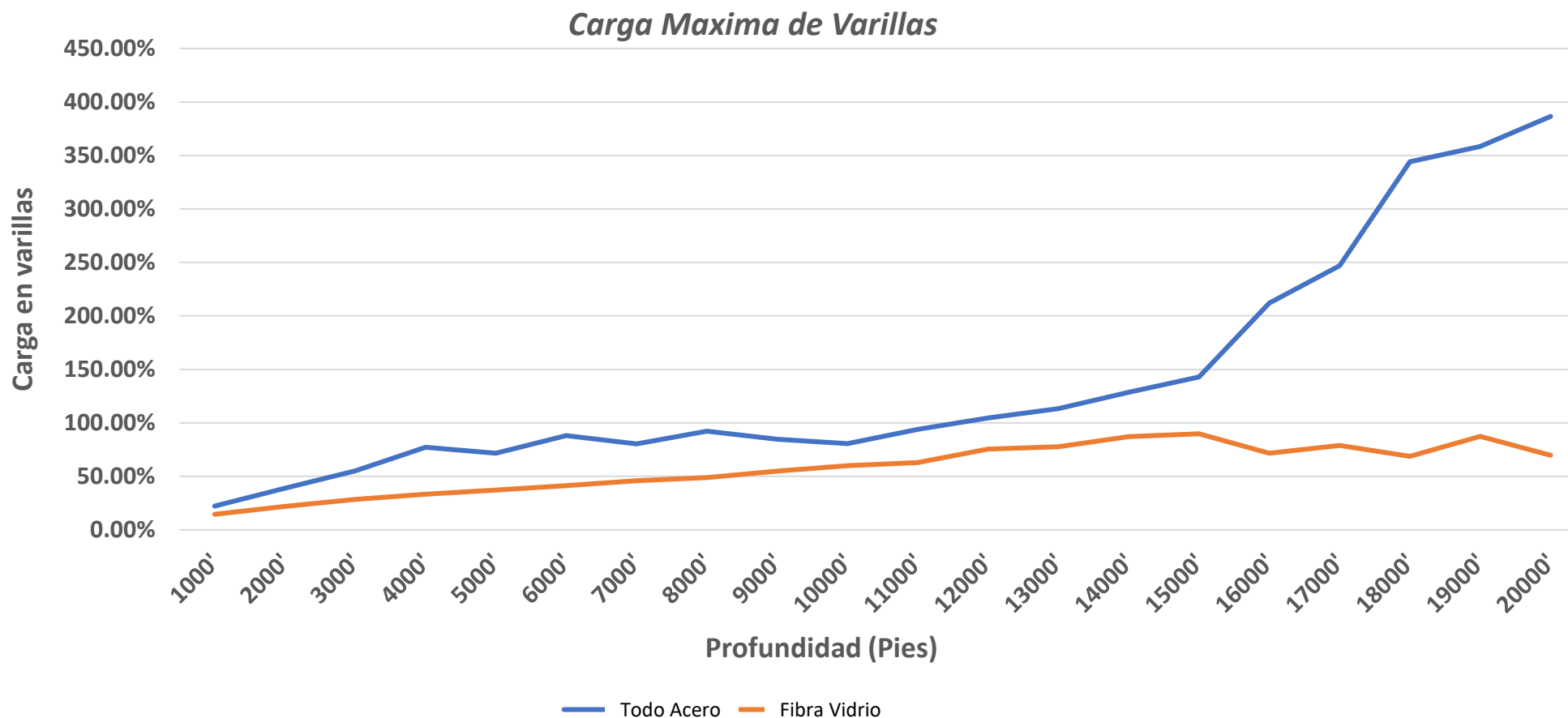
Ventajas diseño con Fibra de Vidrio comparado con otros diseños



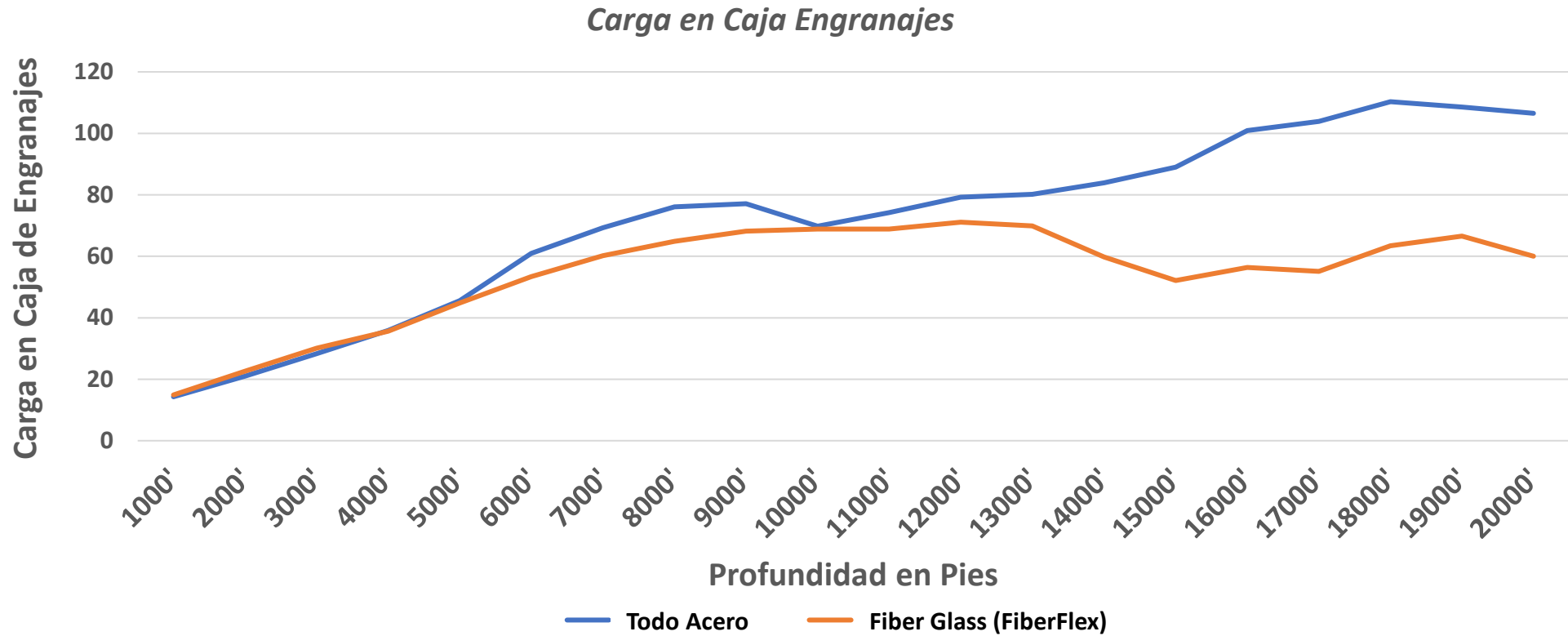
Ventajas diseño con Fibra de Vidrio comparado con otros diseños



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