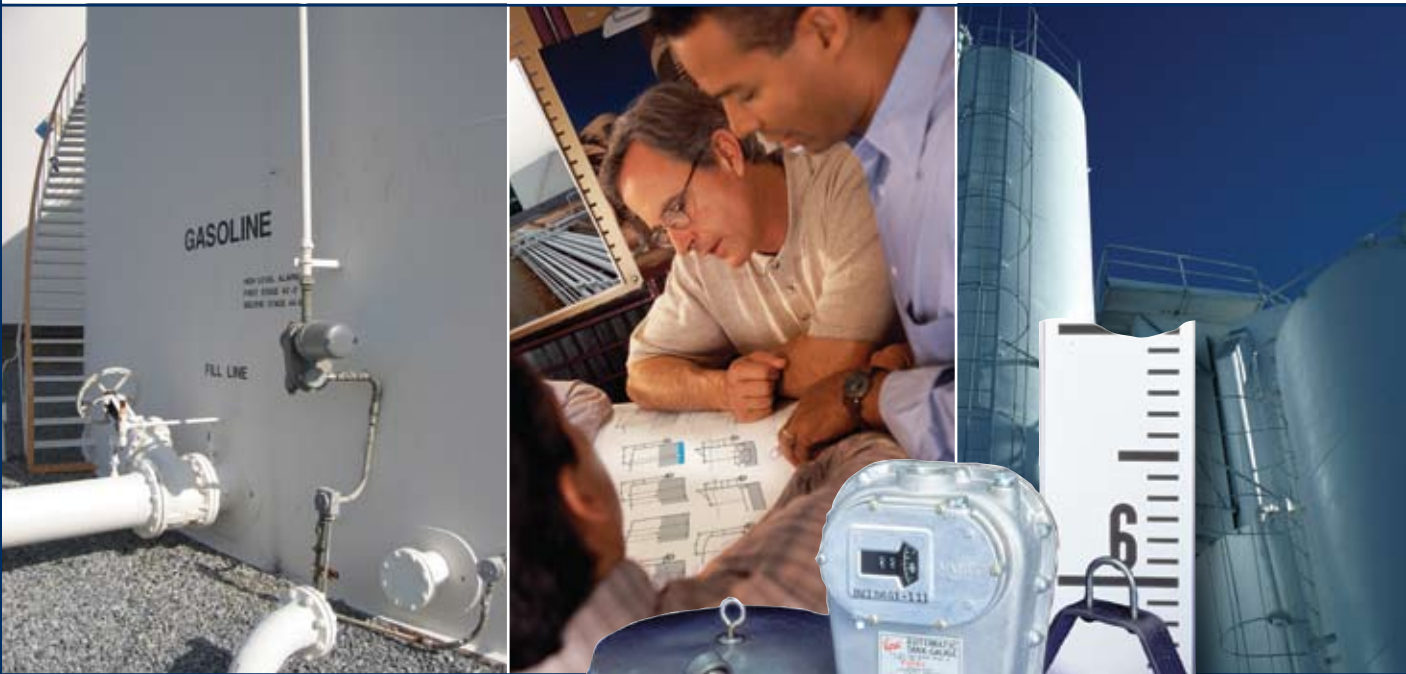


Varec[®]

Float and Tape Tank Gauging



Automation solutions for oil & gas, defense and aviation applications

Affordable and Reliable

**...for bulk storage applications in refineries,
tank terminals and chemical plants**



Power or communications wiring is not required to provide local display of your product at the tank side or on the tank roof.



2500 Automatic Tank Gauge (ATG)



2520 High Pressure Automatic Tank Gauge (ATG)



6700 Liquid Level Gauge

Simple Mechanics

Varec® float and tape tank gauges are often referred to as ‘float and tape devices’ due to the manner in which the product level is measured (or gauged). This simple design has changed very little over the years due to its reliability and industry-wide acceptance. It provides continuous level measurement and allows the gauge to perform with minimal maintenance throughout its operating life.

Complete Solutions

Varec has maintained all the options and accessories you would expect that accompany the Varec® brand of float and tape tank gauging products, including:

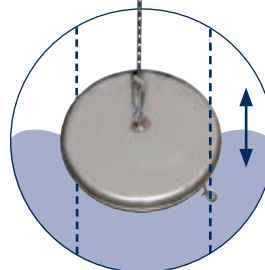
- Installation kits and accessories for product compatibility and tank conditions
- Spare parts and maintenance kits to keep your gauge operating smoothly
- Tank gauge transmitters for level and temperature measurement integration and inventory control applications
- Additional support services, such as preventative maintenance programs and training classes



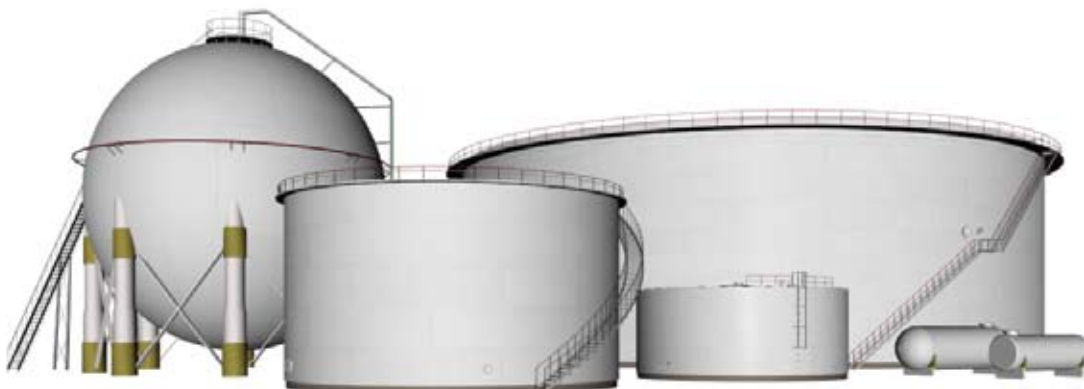
The 2500/2520 Automatic Tank Gauges utilize a dial and counter within the gaugehead to display the level of product in your tank.



The gauge board of the model 6700 can easily be seen from long distances and provides the simplest form of tank gauging.



A large float follows the level of the product as it moves up and down in the tank. The float is connected to a tape or wire that in turn is connected to an indicator on the outside of the tank.



Tank Gauge Installations

“Float and tape gauging is suitable for almost all product applications and tank types.”

2520 High Pressure Automatic Tank Gauge (ATG) is provided in kits for measuring 16, 48 or 60 ft (5, 15, or 18.3 m) spheres and bullet shaped tanks.

The 2500 ATG extended range kits, for use on large tanks, provide a measuring range up to 97 ft (30 m).

The 6700 is available with a half-travel kit for tanks up to 97 ft (30 m) in height.

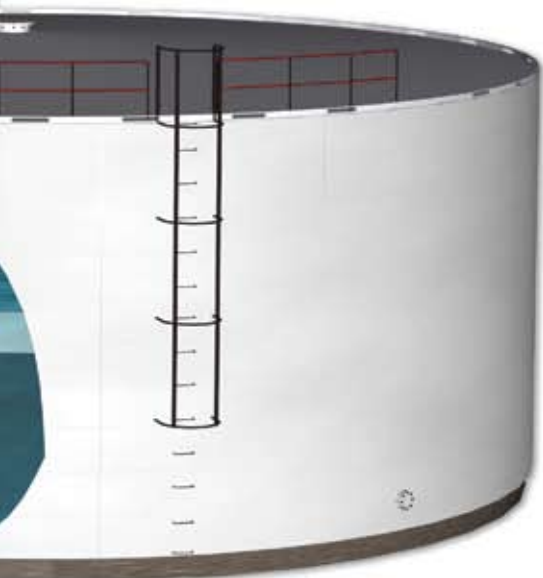
Tank Type

For float and tape tank gauge applications, the most important question by far is “what type of tank installation is required?” Varec can recommend gauge solutions based on various tank requirements, including:

- Roof or ground reading
- External floating roofs
- Internal floating roofs (pans)
- Floatwells
- Stillingwells
- Extreme pressures
- Bolted tanks
- Spheres and bullets

Level Accuracy

The 2500, 2520 and 6700 offer a level accuracy of 0.2-1” (4-25 mm). The 2500 and 2520 display the measured level using a dial and counter in increments of 1/16th inch (1.58 mm) and the 6700 uses a gaugeboard with 1” (25 mm) increments.



Float Guidewires

Guidewires provide stability for the float during turbulent conditions and increased accuracy by reducing the horizontal movement of the float across the surface of the product. Accessories are available to allow in-service installations, such as weighted anchors that maintain tension in the guidewires without the need for welding inside the tank.

Product Type

Due to the float and tape measurement technique, the following are just some of the products suitable for level measurement using a float and tape device:

- Crudes
- Gasoline
- Jet fuel
- AV (aviation) gas – high octane gas for small aircraft
- Diesel
- Chemicals
- Additives
- Solvents
- Water

Special Materials

Standard, moderate, severe and extreme service kits are available for applications involving extreme temperatures, pressures or aggressive products. These kits include material options for specific parts that make contact with the product in the tank, tape piping or gaugehead, such as:

- Steel
- Aluminum
- Stainless steel
- Fiber reinforced vinyl ester
- Monel
- Carpenter 20 steel

Maintenance

As with all instruments, a regular schedule of maintenance is recommended. The frequency of such inspections depends on the specific environmental conditions and operations involved. Due to the various conditions, even from tank to tank on the same site, installations should be studied and a routine of inspection and maintenance should be planned that is best suited to individual needs.

We can provide a multi-step maintenance program for your specific facility with a single aim – to improve the operations of your business by restoring and maintaining your ATGs to their original level of quality and performance.

Our programs include a full site survey and report. After the program has been implemented, we guarantee the operation of your gauges for two years (parts and labor).

Spare Parts

We are the only manufacturer of genuine Varec spare parts. In addition to single spare parts, we have used our experience to create a number of spare parts kits for specific maintenance tasks from basic maintenance to an overhaul kit for a gauge on a tank undergoing an API 653 inspection.

To assist your technicians, we have created a complete set of documents that are available from our website or sales representatives. Each document will help you identify the part you require and simplify the order process.

Replacing parts in a Varec product with parts that are manufactured by third parties will reduce the effectiveness of your instrument and may void the hazardous area approval certification.

Accessories

Varec manufactures a complete range of accessories to help reduce wear from the float and tape to the gaugehead components, thereby simplifying and reducing the maintenance required for specific applications.

- Inspection and manhole cover
- Negator cassette
- Conduit vent
- Oil seal
- Condensate reservoir
- Tape wipe
- Float connector

Training

If you have your own service technicians, we can provide factory-certified training. These classes are very effective for anyone that maintains the operation of float and tape gauges. The classes can be conducted at your facilities, in your time frame by a certified instructor with over 15 years Varec field service experience.

- Learn how to correctly align all parts to prevent a tape breakage and eliminate gauge hang-ups
- Learn which parts should be lubricated and which lubricants to use
- Learn other tips and tricks that will keep your gauge running smoothly year after year

Tank Gauge Maintenance

“Keep your gauge operating at peak performance for years to come.”

The Varec 2500 Automatic Tank Gauge (ATG)

Dual entries in the precision die-cast housing allow the 2500 ATG to be mounted at the tankside or on the tank roof.

The large, easy-to-read display is available in metric or imperial units.

The display is driven via a direct drive manufactured from brass bushings for smooth accurate operation.

The float operation check knob allows the technician to ensure the gauge is operating correctly.

Various shapes and sizes of hollow shell floats are available that suit different applications.

Guidewires can be installed while the tank is in service using weighted anchors.

Tank gauge transmitter attaches to the back of the gauge and is engaged on the direct drive coupling.

The 2500 ATG is Factory Mutual and ATEX approved for use in potentially explosive atmospheres.

The negator cassette simplifies the process of negator motor replacement and improves the performance of your float and tape tank gauge.

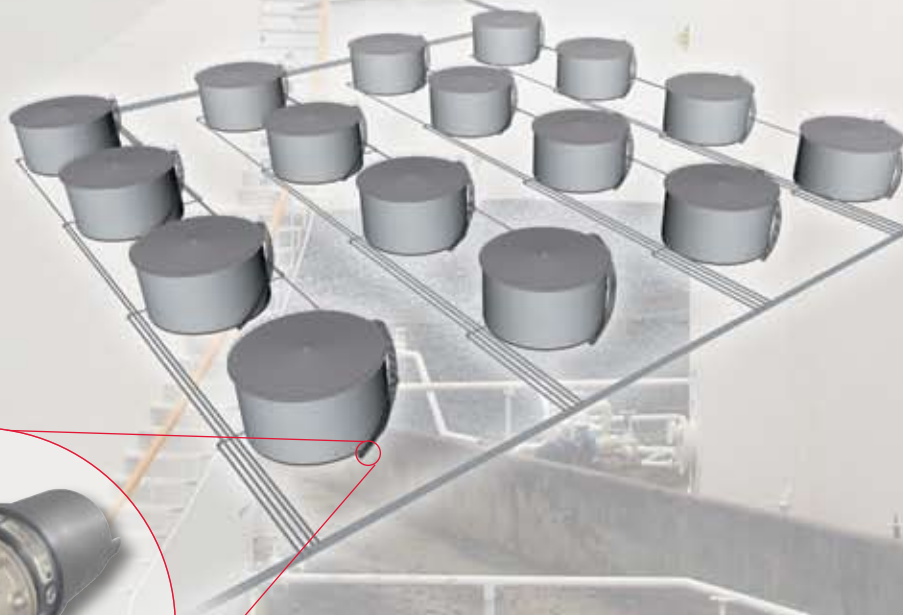
Guidewires prevent horizontal movement of the float as it follows the product level.

Tank Gauge Transmitters

“Providing the first steps to
inventory management and control”

 **FuelsManager**®

FuelsManager provides real-time operational information on the status of a single tank or multiple tanks. Using standard displays, operators can react quickly to changing conditions, alarms or events within your facility.



Level measurement data is encoded by the transmitter and output via industry standard communications to the control room. When a tank gauge transmitter is used, communications and power are required at the gaugehead.

A range of analog and digital tank gauge transmitters are available that mount directly to float and tape tank gauges.

Temperature

Some transmitters also offer spot temperature measurement integration that can be used for inventory control applications. They are usually installed at the tank base and integrated using a tank gauge transmitter. The inventory control system in the control room can then calculate volumes that are temperature corrected. Spot temperature sensors are appropriate for float and tape tank gauging while average temperature devices are generally associated with radar or servo tank gauges due to the increased accuracy required.

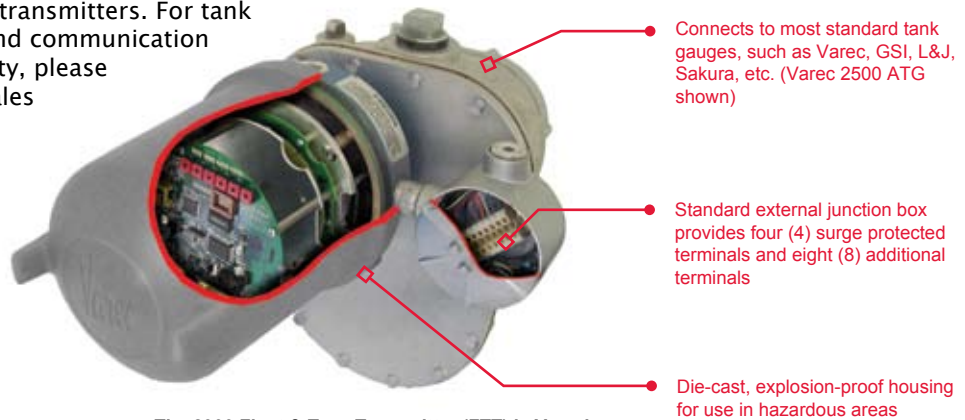
Additional Functionality

Tank gauge transmitters may also offer the following functionality:

- PLC and RTU compatibility
- Status indication using inputs and outputs to meters, alarm lights, horns, etc.
- Local configuration with or without handheld devices or laptop PCs
- Lightning and surge protection
- Industry approvals for use in hazardous environments

Communication Protocols

You may already have existing tank gauges installed that require transmitters. Depending on the manufacturer of these gauges, you may be able to use Varec transmitters. For tank gauge, transmitter and communication protocol compatibility, please contact one of our sales representatives.



Includes a 3-year warranty!

The 2900 Float & Tape Transmitter (FTT) is Varec's latest precision absolute optical encoder (Patent Pending).

Rotary switches allow you to configure the transmitter without a handheld device

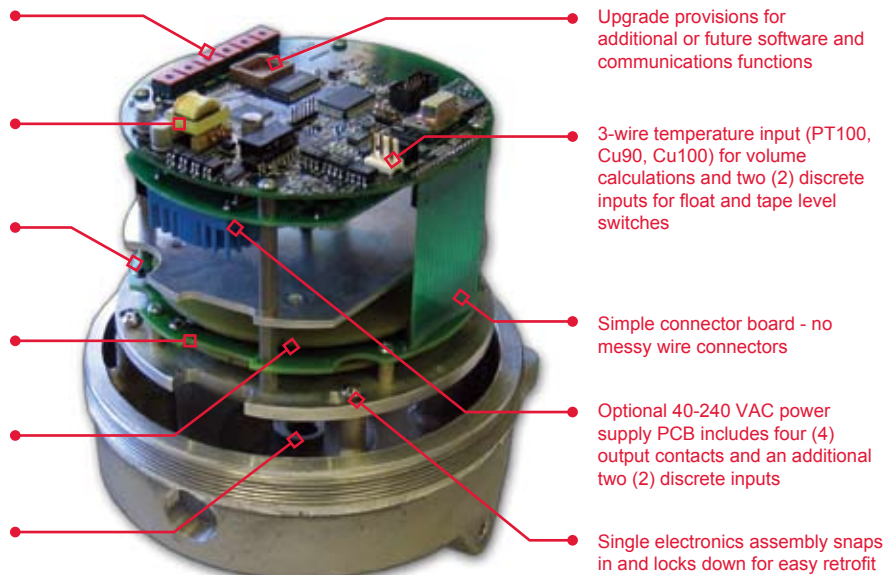
On-board galvanically-isolated power circuit (20-65 DC) and optically-isolated communications

Absolute encoder - maintains correct level reading even after a power outage - no battery required

Infrared optical sensors not affected by direct sunlight

Dual-encoder discs with reflective gold plating and reference tracks ensure an accurate level reading

Precision direct-drive stainless steel gearing eliminates the problems associated with Geneva gears



Float and Tape Tank Gauging

6700 Liquid Level Indicator

The simplest float and tape gauging product available indicates level on the side of the tank



- Provides an accuracy of 1" inch (25 mm)
- Continuous level measurement with no power required
- Durable aluminum gaugeboard with vinyl facing
- Various installation options available for almost every tank type

2500 Automatic Tank Gauge

The industry standard for float and tape tank gauging for over 50 years



- Provides a level accuracy of 0.2-1" inch (4-25 mm)
- Continuous level measurement with no power required
- Meets API Chapter 3.1B regulations for inventory control applications
- Large, easy-to-read display
- Suitable for virtually every tank gauging application



2520 High-Pressure Automatic Tank Gauge

Float and tape tank gauge specifically designed for high pressure applications



- Provides a level accuracy of 0.2-1" inch (4-25 mm)
- Continuous level measurement with no power required
- Meets API Chapter 3.1B regulations for inventory control applications
- Kits for spheres or bullet tanks pressurized to 150 or 300 psig (1136 & 2170 kPa)

Negator Cassette Kit

The negator cassette kit replaces the existing negator motor and sheave inside a tank gauge to provide the following benefits:



- Improves the performance by self-aligning the tape and motor
- Increases reliability and reduces maintenance by protecting the motor from pipe debris
- Safer, easier and quicker service due to compact unit with no tape to pull or hubs to unwind

Tank Gauge Accessories

A complete range of genuine Varec tank gauge accessories are available for atmospheric and high pressure installations, including:



- Floats
- Float shock absorbers
- Condensate reservoir
- Manhole covers & inspection hatches
- Guidewires and anchors
- Conduit elbows, oil seals and support brackets

Tank Gauge Maintenance Kits

Depending on maintenance requirements, you are able to choose a kit with all the parts you need

- Shoulder bushing kit to get your gauge running smoothly again
- Basic kit for annual maintenance
- Extended kit for a gauge that has not been maintained for some time
- Overhaul kit for a gauge on a tank undergoing an API 653 inspection



Over 50 years ago, the oil and gas industry quickly adopted both the API Standard and Varec float and tape tank gauges as the standard for level measurement and continues to support them today.

Inventory Management & Control

FuelsManager Oil & Gas

The most complete tank gauging software solution available, combining inventory management with automation and control



- Integrates all major types of tank level, temperature and mass measurements into one system
- Integrate pumps, valves, meters and PLCs seamlessly into your inventory management system
- Select industry standard volume correction methods, including API, ATSM, IP, JIS Polynomial and others

Tank Gauge Interfaces

Tank gauge interfaces offer data acquisition, open systems architecture and host communications



- Expansion modules support the majority of tank gauge protocols and digital & analog I/O
- 8130 Remote Terminal Unit (RTU) utilizes up to four expansion modules to support multiple tank gauging communication loops
- 8300 TankGate Interface (TGI) utilizes a single expansion module

Temperature Sensors

Integrate a spot temperature sensor using a tank gauge transmitter to calculate product volumes



- Platinum (Pt100) and copper (Cu90 or Cu 100) elements available
- Universal process connections allow a wide range of compatibility and easy installation

2900 Float & Tape Transmitter

Integrate a float and tape tank gauge into your inventory management system



- Supports the following tank gauging communication protocols: Mark/Space (1800-1900), EIA-485 MODBUS, Tankway (L&J), GPE or Whessoe Bus (Whessmatic 550)
- Precision designed and manufactured absolute encoder utilizes gold plated reflective tracks for optical level measurement
- 3-Wire RTD temperature input and 2 discrete inputs as standard
- Optional 4 contact outputs and an additional 2 discrete inputs
- Upgrade your existing Varec, L&J, GSI, Sakura or other manufacturers' transmitter
- Patented reference tracks ensure an accurate measurement every time
- Stainless steel direct-drive gearing ensures smooth, reliable operation
- Independent surge protection - galvanically-isolated power circuit and optically-isolated communications
- Die-cast aluminum, explosion-proof housing FM approved for use in hazardous areas

2557 Limit Switch

Provides electronic indication of alarms or relays for tank gauging and inventory control applications



- 2, 4 or 6 SPDT cam-operated switches
- User selects the level (cam positions) when the contact opens or closes
- Mounts to most float and tape tank gauges
- UL/CSA approved for use in hazardous areas

Wireless Communications

Utilize reliable wireless data communications for tank gauging applications



- Designed for communications between your instruments and an interface device
 - Variety of communications, including Bluetooth, 900 MHz spread spectrum, IEEE 802.11 b/g and cellular
 - Supports the complete range of Varec tank gauges or third-party manufactured gauges
 - Simple, low cost installation - AC or DC operation
- ## 4000 Advanced Technology Transmitter
- Integrate a float and tape tank gauge into your inventory management system
- Supports the following tank gauging communication protocols: Mark/Space, Matrix, EIA-485 MODBUS, Whessoe Bus, TankWay, TIWAY, GSI - MODBUS, GSI - ASCII, GPE
 - Utilizes a maintenance-free, incremental-optical encoder with battery back-up
 - 3-Wire RTD temperature input and extensive lightning protection as standard
 - 4110 HART Level Encoder Transmitter available that utilizes HART communications to transmit level to a HART Host

8200 Current Output Transmitter

Integrate a float and tape tank gauge into your inventory management system using an analog 2-wire 4-20 mA signal



- Rugged incremental-brush encoder
- Optional 2 or 4 SPDT cam-operated switches
- Optional on-board 115 - 230 VAC power supply
- FM approved for use in hazardous areas

Measurement, Control and Automation

Oil & Gas

Varec has served the petroleum and chemical sectors for over seven decades - working with industry leaders to pioneer automatic tank gauging (ATG) instrumentation, inventory management and custody transfer approved systems. Today, Varec continues to be a technology leader, innovating new ways to improve efficiencies and manage information across your entire business.

Aviation

Varec is a worldwide leader in fuels management systems, providing performance solutions for commercial aviation fueling requirements. Varec's FuelsManager Aviation is an integrated, scalable solution - from simple fuels accounting to a fully automated airport - utilizing the latest mobile computing, web-based services, wireless communications and paperless ticketing technology.

Defense

Varec provides mission critical, commercial off-the-shelf solutions that are essential to air, ground and naval fueling applications. FuelsManager Defense manages and controls all bulk liquid assets in the dynamic environment of a military or government owned fuels facility, including functionality for transaction and inventory management, SCADA, tank gauging, dispatch and ADC.

Go to varec.com for more information.

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The Varec logo is written in a white, stylized, cursive font with a registered trademark symbol (®) at the end.