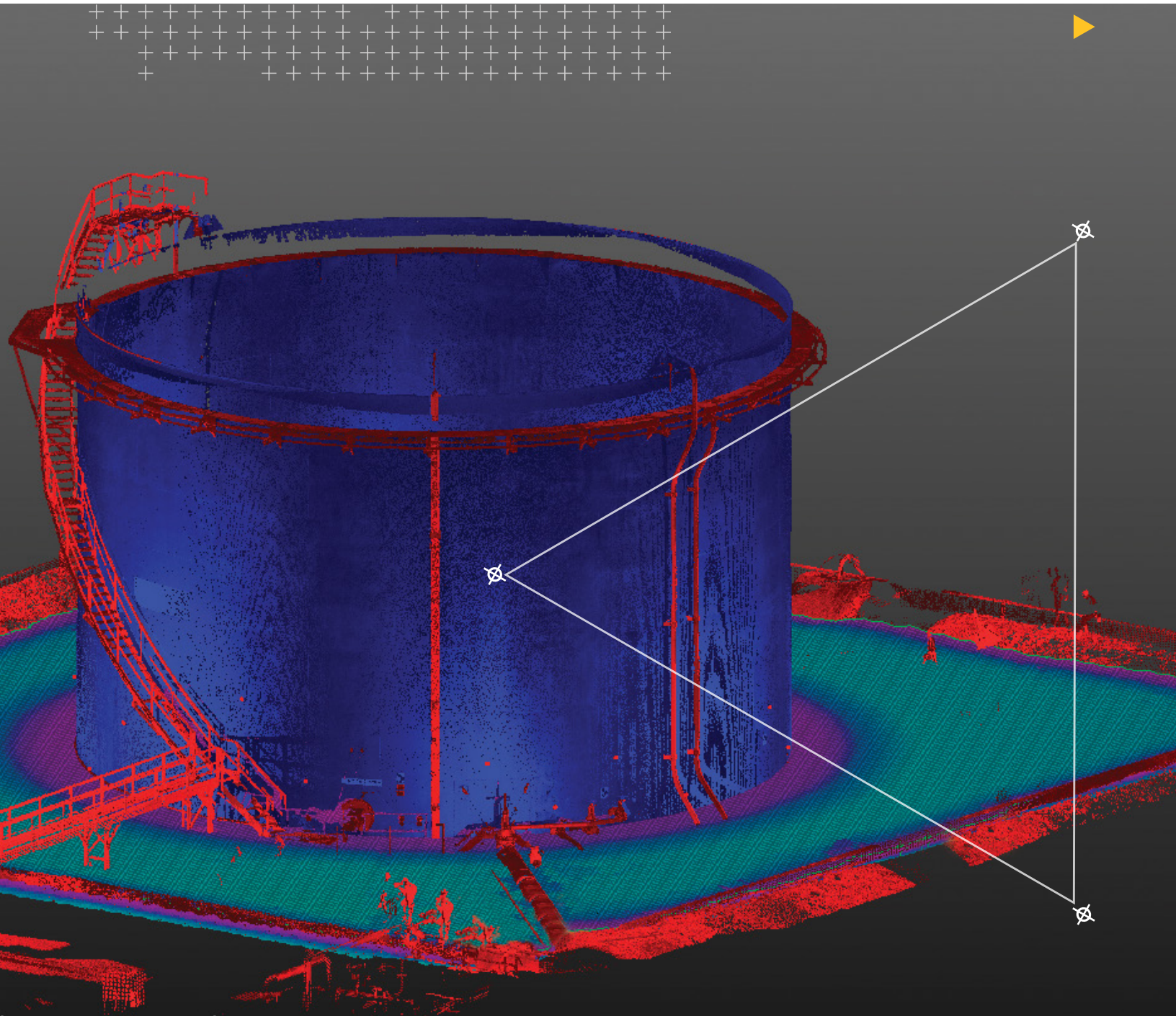

Storage Tank Solutions

Trimble TX8 Scanner: A Revolution in 3D Scanning

TRUE PERFORMANCE IN A REAL WORLD

The Trimble® TX8 laser scanner sets new standards for performance and ease of use in high-speed collection of 3D data. Using a state-of-the-art blend of speed, long range and precision, the Trimble TX8 delivers high quality results in industrial measurement, engineering, construction, forensics, and other applications that require high levels of accuracy and flexibility.

The TX8 combines speed and range to reduce the time and effort for 3D scanning. The TX8 lets you gather data more quickly from each setup while the scanner's long range reduces the number of setups needed to do the job. As a result, you'll finish your projects faster and with the confidence that your data is complete and accurate.

Using Trimble's patented Lightning™ technology, the TX8 can measure one million points per second while capturing precise data over its full measurement range. Because Trimble Lightning technology is less susceptible to variation in surface types and atmospheric conditions, you can capture complete datasets from each station. The TX8 streamlines work in the office as well. The scanner's clean, low-noise data results in less time for processing. Data from the TX8 loads directly into Trimble RealWorks® software. The TX8 paired with RealWorks also provides efficient dataflow into popular CAD programs.

High Perfomance for Demanding Storage Tank Applications

The Trimble TX8 is ideal for capturing detailed data on existing conditions. Making high-speed measurements without compromising range or precision, the TX8 delivers high-density 3D point clouds needed by design and analysis professionals. The TX8 provides a 360 degree by 317 degree field of view and captures data at one million points per second with a typical scan time of only 3 minutes. The TX8 maintains its high precision over its entire range of 120 m and is available with an optional upgrade extending the range to an impressive 340 m.

Delivering the power and flexibility to tackle even the most demanding projects.

Rugged, Flexible and Easy to Use

A color touchscreen display and one-button scanning make data capture easy and efficient. The intuitive onboard software lets you quickly manage scan resolution and define scan areas. Because you capture only the data you need, you'll save time in the field and office.

Benefit from the flexibility to operate in demanding environments and situations. With its eye-safe Class 1 non-visible laser, the TX8 is safe to use even in busy public places.

The TX8 features a rugged design, IP54 environmental rating, protected mirror and ability to capture data in bright sunlight.

Designed for mobility, the TX8 weighs just 11 kg and is powered by lightweight, long-life lithium ion batteries. The wheeled transportation case conforms to requirements of most airlines for checked luggage which allows you to easily transport the TX8 between job locations.

The Total Solution

With the Trimble TX8's ability to capture precise high-density 3D data combined with Trimble RealWorks Advanced-Tank edition software advanced modeling, analysis, and data management tools, the Trimble TX8 laser scanner is the complete scanning solution for storage tank operations professionals.

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Trimble RealWorks Advanced-Tank Edition: Advanced Productivity

STORAGE TANK INSPECTION

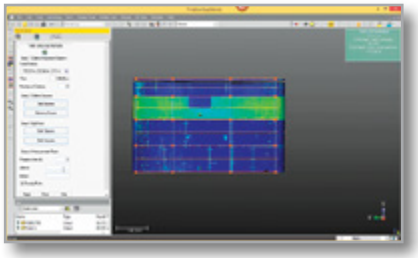
The construction and safe operation of storage tanks requires thorough, regular inspection. Spatial inspections to detect tilt, differential settlement, and deformation are an important part of tank construction and sustained, reliable operations. Structural modifications, process changes, and stored product changes can all require inspections and suitability assessments.

Combining the power of advanced laser scanning technology with software tailored to support storage tank analysis produces superior results while saving time in the field and office. Quickly collect accurate, detailed measurements of complex storage tank features including complex sump and bottom details with the Trimble TX8 laser scanner. The Trimble RealWorks Advanced-Tank Edition features highly-automated, efficient workflows to thoroughly analyze complex datasets and create industry-standard inspection deliverables. Automatically detect out of tolerance areas and produce reports according to API 653 Standard guidelines and efficiently produce highly-accurate holding volume calibration tables. Together these products are a complete solution with the accuracy and efficiency needed to fast track your productivity.

SPECIALIZED FEATURES FOR STORAGE TANK OPERATIONS PROFESSIONALS

Simplified Workflow

- Easy configuration to analyze tanks following API 653 Standard guidelines
- Rapid, automated detection of out-of-tolerance areas
- Advanced analysis tools for complete inspection in the office



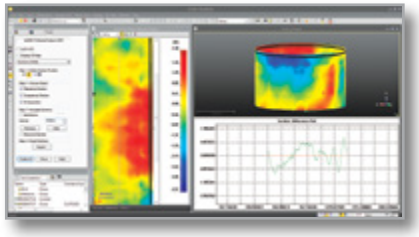
Select station spacing, vertical intervals, and set tolerances for automated reporting

Industry-leading storage tank solutions.

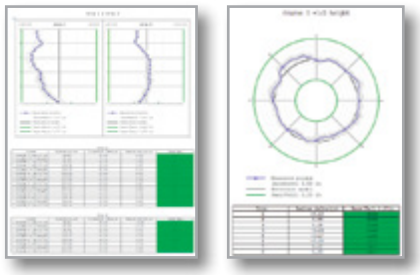
Trimble's complete solutions for applying laser scanning technology to perform precise, accurate, storage tank inspections and calibrations save money, increase field worker safety, and produce superior results over other spatial measurement methods.

Industry-Standard Deliverables

- Graphical and tabular outputs following API 653 Standard reporting guidelines
- Clear reporting of tolerance pass or fail



Perform detailed analysis of tank shell features in the office



Graphic and tabular reports following API 653 Standard guidelines

Advanced Interactive Deliverables

- Published packages offer a complete, interactive project review experience to stakeholders

Publish rich, detailed results for the Trimble RealWorks Viewer

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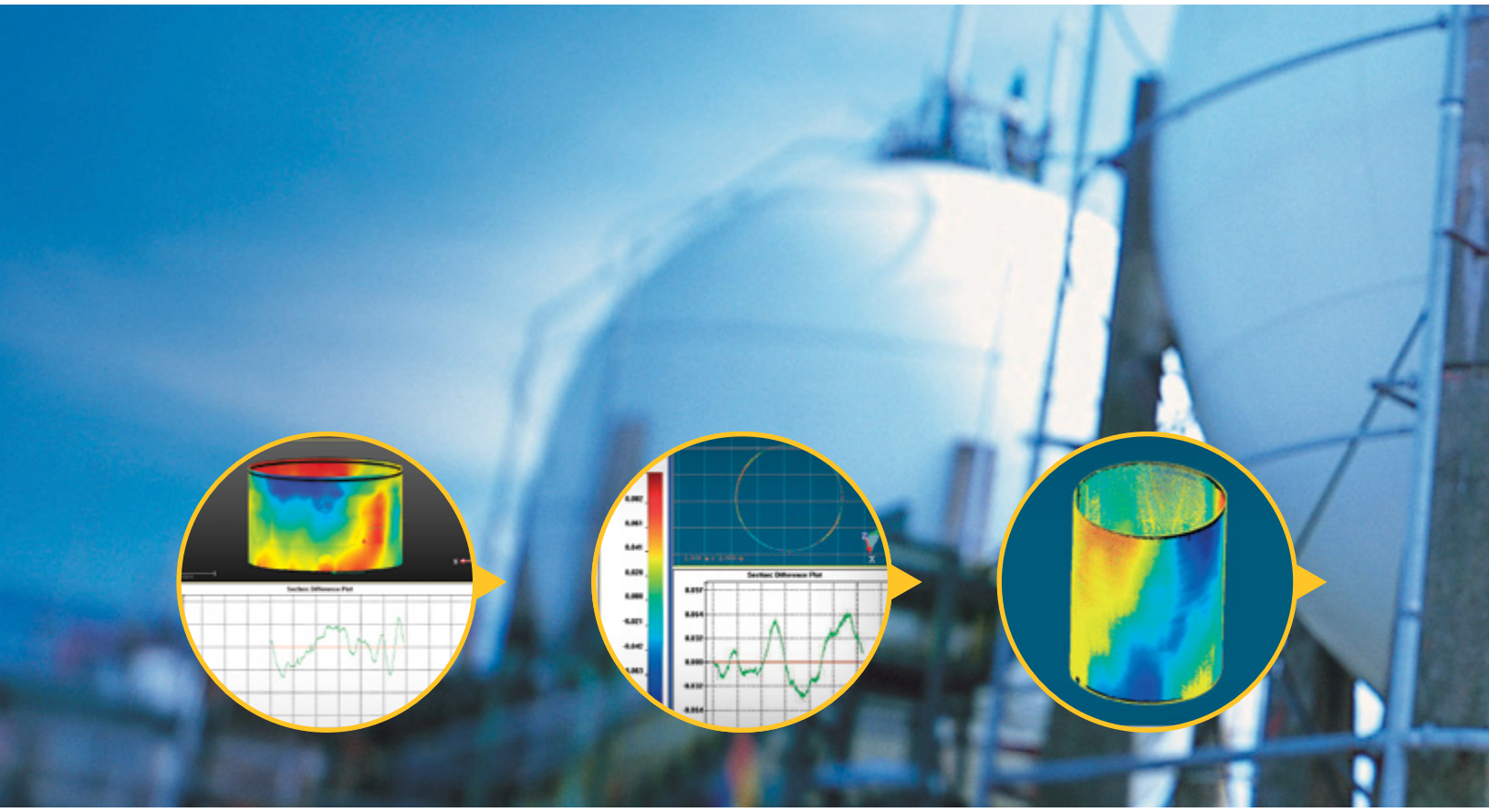
Trimble RealWorks Advanced-Tank Edition: Advanced Productivity



TAILORED SUPPORT FOR ANALYSIS WORKFLOWS

Storage tank inspectors are increasingly adopting laser scanning as a measurement technology to collect dense, accurate data quickly in the field. Trimble works closely with industry professionals to understand the specialized workflows and deliverables associated with storage tank inspections. The result is a software solution specifically for tank inspection operations involving laser scanning. The Trimble RealWorks Advanced-Tank Edition provides optimized processing, analysis, and reporting functions to provide results in a fraction of the time of traditional methods.

Streamlined Workflow

Trimble RealWorks Advanced-Tank offers a streamlined, guided workflow to quickly produce spatial inspection deliverables.

The workflow can be summarized in just a few steps:

- Import and register laser scanning point clouds
- Clean the data set to focus on the tank shell
- Define the inspection stations around perimeter
- Define courses and vertical inspection intervals
- Define tank bottom inspection intervals
- Define tolerances for automatic issue detection
- Perform additional, focused inspection on out-of-tolerance features
- Generate industry-standard reports with customized content

Specialized Toolset for Tanks

The Advanced-Tank Edition includes all of the features of Trimble RealWorks and adds specialized tools to automate

Data analysis power with industry-standard deliverables.

storage tank inspections using laser scanning technology. A single software supports point cloud registration and editing, colorizing point clouds with high quality imagery, inspecting the tank shell, and producing industry-standard reports.

Advanced Inspection Capabilities

Trimble RealWorks Advanced-Tank automatically detects areas that are out of tolerance. Following this automatic detection, issues can be inspected in greater detail and clearly reported to stakeholders. Complex internal structures including mixers, heaters, irregular floors, and specially-configured sumps can all be analyzed in detail to produce very complete inspection deliverables. The powerful tools in RealWorks also simplify the analysis of secondary containment systems. Rapidly locate initial overflow points, areas that need remediation and the maximum holding volume.

Complete Deliverables without CAD

The Advanced-Tank Edition eliminates the need to use CAD software to create final inspection reports. All of the measurements, charts, and tables for industrystandard reports are created in Trimble RealWorks. Published packages provide an additional, interactive way to share tank inspection details. Save time and money producing complete datasets in a single software environment.

Industry-Standard Reporting

Trimble RealWorks Advanced-Tank automatically produces graphic and textual reports as recommended in the API 653 Standard. Roundness reports are produced for each defined course and other selected vertical inspection intervals. Verticality reports are produced for each user-defined station. Bottom settlement reports thoroughly detail conditions for all standard tank bottom designs.

Trimble RealWorks: Efficient Calibration Tools

DELIVERING ACCURACY AND RESULTS YOU CAN STAND BEHIND

In the petroleum industry, it is vital to know precisely the amount of product held in and transferred from, storage tanks. Traditional methods of calibrating storage tanks employ complex, labor-intensive techniques to achieve the required standardized results. Trimble tank calibration solutions provides an extremely efficient, cost-effective way of accurately determining the volume of storage tanks.

Greater Accuracy, Certfieds

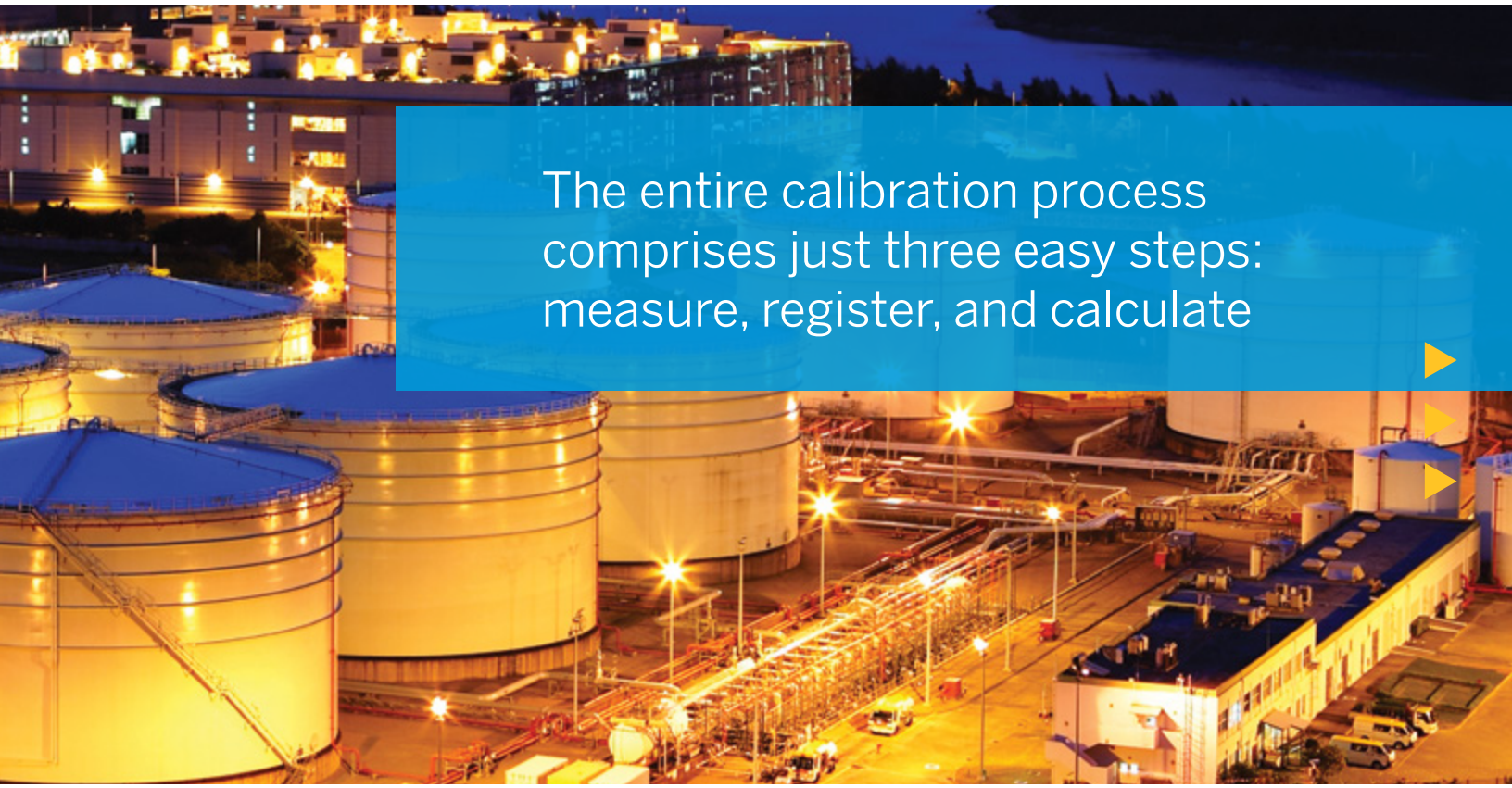
Trimble solutions provide accuracy and results you can stand behind. The traditional calibration method determines the internal volume of each storage tank via external measurement. Casing and paint thickness, and casing plate overlaps, must be estimated, and reference and vertical cross-sectional areas are assumed to be circular. Results may therefore offer questionable accuracy. Using Trimble laser scanners to measure the actual cavity inside the storage tank, you can determine the real volume of the tank and achieve optimally accurate, reproducible results.

International Standards for Storage Tank Calibrations

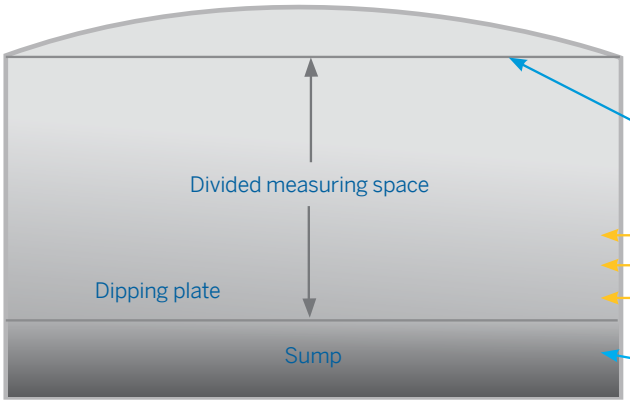
The International Organization for Standards (ISO), International Protection (IP) and American Petroleum Institute (API) specify standards for the calibration of large vertical storage tanks.

These standards are typically achieved via external measurements and estimation, including:

- The tank circumference along a reference plane
- The vertical deviations of the tank surface at several locations using plumbing methods
- The tank sump below the datum plate
- Trimble laser scanning solutions provide this data necessary for the calculation of storage tank volume



The entire calibration process comprises just three easy steps: measure, register, and calculate



Filling Level Above Datum Plate	Volume Up To Filling Level of Section with Sump	Filling Value for Vertical Section
mm	L	L / mm
13 526	10 8000 007	
		2 972.5
4 374	13 600 263	2 972.5
1 923	6 315 156	2 972.5
897	3 265 884	2 972.5
		2 972.5 (Sump)
0	600 000	

Shown is an example of the table created for each tank upon commission. The table is "updated" with the results of any calibration performed.

Trimble RealWorks: Efficient Calibration Tools

Enviromentally Responsible

Prevent water waste, contamination, and environmental pollution. Sump capacity is frequently measured via large amounts of water pumped into the sump space. During this process the water is contaminated—often by oil or petroleum. The Trimble solution omits this step entirely.

A storage tank calibration solution that is faster, more accurate, and more cost-effective.

Faster and More Efficient, Less Costly

One worker can complete measurements and analysis in one day. The speed and efficiency of the Trimble solution offers multiple benefits to make your business more competitive, increasing your profits:

- Decrease costs for each job
- Win more jobs by offering lower rates
- Take on more jobs with more time and employees available

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About Trimble's Geospatial Division

Trimble's Geospatial Division offers solutions that facilitate a high quality, productive workflow and data exchange to drive value for organizations of all sizes through efficiency, productivity, and safety. Our innovative technologies feature integrated sensors, field applications, real-time communications, data processing and modeling applications, and analytics—to facilitate productive workflows and exchange of data—ensuring organizations capture the most accurate spatial data and transform it into powerful insights for higher quality performance and confident decision making. Whether it's about better using our natural resources to produce energy or extending the life of our civil infrastructure, reliable information is at the core of our solutions, transforming the way people work and live.

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