CAT® SOIL COMPACTION

TECHNOLOGIES



CAT®

CAT® SOIL COMPACTION TECHNOLOGIES

FOR CONSTRUCTION

Cat® Compaction technology offerings may vary by region and model. Consult your Cat dealer for details.

A solid foundation is the base of our infrastructure system and Cat® Compaction technologies for soil are designed to help contractors achieve soil density targets with confidence. From compaction measurement to documentation, granular to cohesive soils, Cat soil compaction technology can help you monitor, visualize and document the work being done.



TAKE QUALITY AND PRODUCTIVITY TO NEW LEVELS

Technology that fits your business and your budget, available as a factory-installed option or as an upgrade.

+ Designed to help operators of all skill levels consistently meet compaction targets faster, more uniformly, and in fewer passes.
+ Helps reduce rework, time and fuel costs.
+ Enhances jobsite safety.

CAT TECHNOLOGY

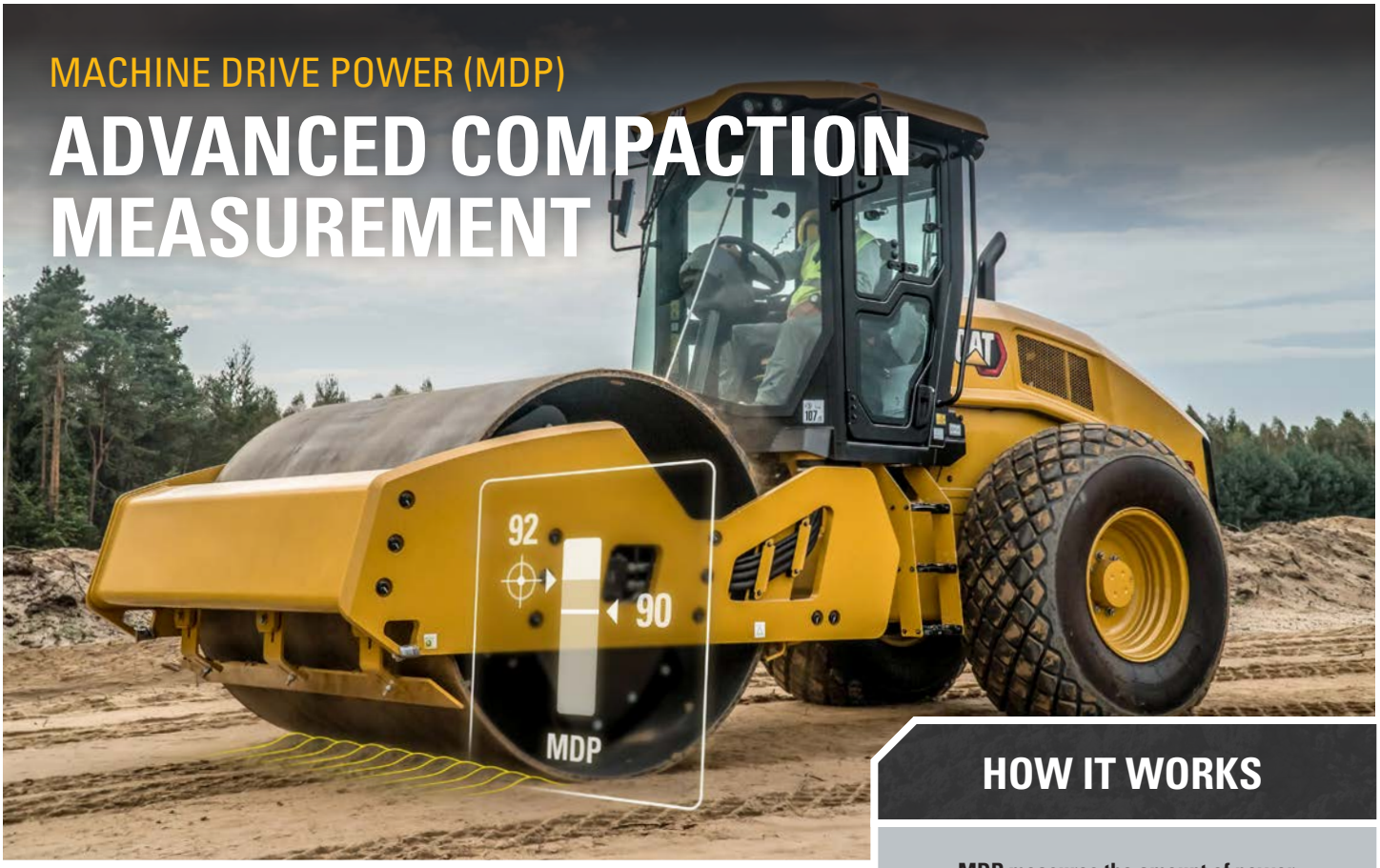
ELEVATE OPERATOR PRODUCTIVITY

Knowing when compaction targets are met so you can move on to the next phase of the job is key when on construction jobs. That's the advantage that compaction technology from Caterpillar provides, helping you finish jobs faster with less fuel and labor costs.



MACHINE DRIVE POWER (MDP)

ADVANCED COMPACTION MEASUREMENT



Caterpillar-exclusive Machine Drive Power (MDP) works differently than conventional methods of measurement. This energy-based technology uses sensors to measure rolling resistance and provides the operator a compaction value which is an indication of soil stiffness.

- **WORKS IN COHESIVE AND GRANULAR SOILS:** MDP adapts to a wide range of soil conditions, making it ideal for diverse job sites. It is ideally suited for cohesive and semi-cohesive soils but can also be used in granular soils.
- **COMPATIBLE WITH VIBRATORY AND NON-VIBRATORY MODES:** MDP can be used whether the vibratory system is on or off, making it ideal for proof rolling.
- **REAL-TIME INSIGHTS:** MDP measures rolling resistance and provides the operator with instant values.
- **EASY TO UNDERSTAND:** An increasing MDP value indicates that compaction is improving. A static number indicates the soil has reached its compactive limit with the roller being used. Irregular MDP values indicate inconsistencies in the soil or underfoot conditions.
- **REDUCE UNNECESSARY PASSES:** The system can identify when compaction targets are met so you can save time, fuel and labor.
- **ALTERNATIVE TO TRADITIONAL MEASUREMENT SYSTEMS:** MDP values are influenced by factors at depths up to about 60 cm (2 feet).

HOW IT WORKS

MDP measures the amount of power required for the soil compactor to propel over the soil, providing an indication of the load bearing strength.



UNCOMPACTED SOIL
SOFT GROUND = MORE EFFORT



COMPACTED SOIL
STIFF GROUND = LESS EFFORT

COMPACTION METER VALUE (CMV)

BUILDING STRONG FOUNDATIONS



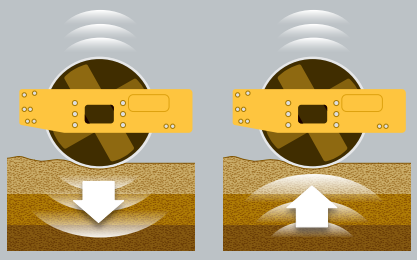
Compaction Meter Value (CMV) is an accelerometer-based technology that uses machine vibrations to measure soil stiffness during compaction. By analyzing the frequency response of the drum, CMV provides real-time data that helps operators achieve optimal compaction with confidence.

- **IDEAL FOR GRANULAR SOILS:** CMV is ideally-suited for sandy and gravelly conditions.
- **INSTANT FEEDBACK:** Displays soil stiffness readings in real-time so operators know when they are approaching compaction targets.
- **EASY TO UNDERSTAND:** An increasing CMV value indicates that compaction is improving. A static number indicates the soil has reached its compactive limit with the roller being used. Irregular CMV values indicate inconsistencies in the soil or underfoot conditions.
- **HELPS REDUCE REWORK:** Deep reading levels can help identify buried objects, soft spots or areas that need moisture conditioning before moving to the next phase of construction or paving.
- **QUALITY CONTROL:** Using CMV helps improve compaction quality and long-term performance.
- **PROOF ROLLING:** Eliminates the need for additional equipment.

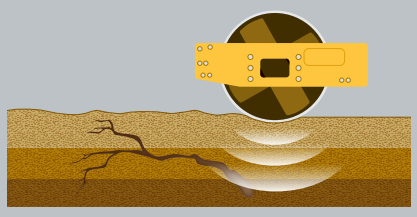
HOW IT WORKS

An accelerometer measures the response of the drum when vibration is on to provide a CMV value that is an indication of the load bearing strength.

MEASURES THROUGH SEVERAL LIFTS
~ 1-1.2 M (36-48 IN) DEEP



MEASUREMENT DEPTHS MORE LIKELY TO IDENTIFY SOFT BASE CONDITIONS



KNOW WHERE YOU'VE BEEN

WITH COMPACTION MAPPING

Cat mapping technology combines compaction measurements, pass count and location to provide a real-time visualization of work as it happens. In addition to monitoring from the operator station, the system records and saves pass count, compaction settings, speed, CMV (Compaction Meter Value) and MDP (Machine Drive Power) values to the cloud to be further analyzed through VisionLink™* or exported for further processing. Mapping utilizes the Global Navigation Satellite System (GNSS) and is available in Satellite Based Augmentation System (SBAS) or Real-Time Kinematic (RTK) accuracy, depending on jobsite needs and machine options.

**Requires a VisionLink PerformancePro subscription.*

- **ACHIEVE CONSISTENT COVERAGE:** Helps operators see where the machine has been or where it hasn't, what meets target and what doesn't, so they can make sure the entire area has been compacted to spec.
- **REDUCE REWORK:** Helps to visually identify potential soil structure problems early in the construction process, allowing for the opportunity implement cost-effective corrections and reduced risk of later rework.
- **BOOST JOBSITE EFFICIENCY:** The mapping system identifies areas that have reached compaction targets, so you're not making more passes than necessary.
- **QUALITY AND PROCESS CONTROL:** Mapping documents and saves data to the cloud so you have proof of the work done, a reference of overall quality of the job and method specs in a visual, easy-to-understand format.
- **COMPLETE PICTURE:** Mapping documents 100% of the area compacted vs spot checks, providing a complete picture of the work that has been done.
- **ANALYZE AND IMPROVE:** Data is stored and accessed through VisionLink for data analysis and process improvement. Data can also be exported through an Application Programming Interface (API).

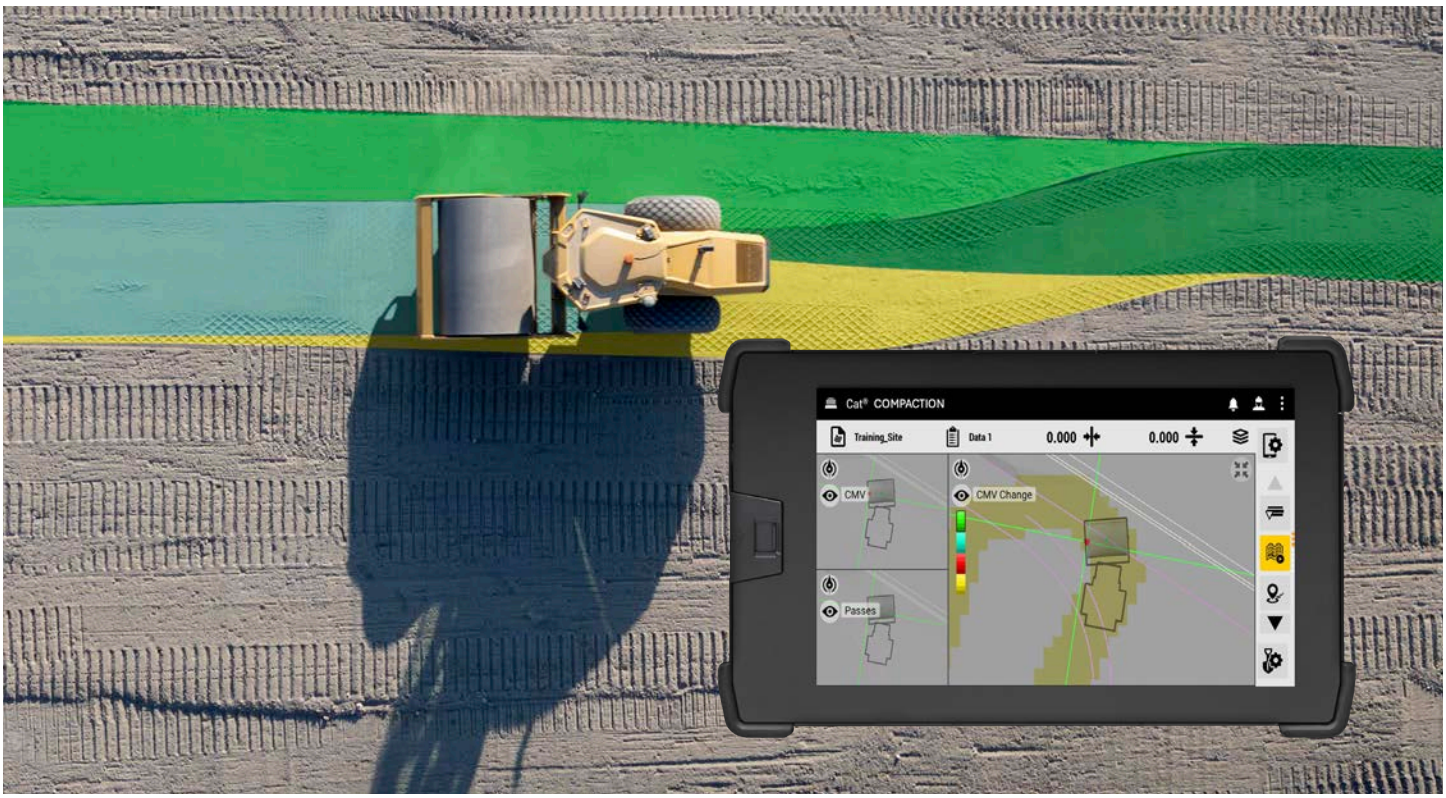




Image simulates compaction coverage.

CAT COMMAND

SEMI-AUTONOMOUS TECHNOLOGY

Cat Command for Compaction* is an operator-assisted, semi-autonomous technology that automates the compaction process based on operator inputs for Cat vibratory soil compactors. Cat Command for Compaction uses settings the operator enters to control speed, direction, steering, and the vibration system of the compactor to provide consistent compaction results.

- **ELIMINATE OPERATOR SKILL GAPS:** Automating the compaction process helps remove inconsistencies that are caused by having different operators of different skill levels execute compaction.
- **IMPROVE COVERAGE:** Utilizes dual RTK correction to achieve up to 60% more coverage compared to a novice operator.**
- **EASY SET UP:** Using an intuitive touchscreen interface designed for simple operation, the operator simply tells the system WHERE and HOW to compact.
- **JOBSITE SAFETY:** Cat Command includes an integrated Object Detection System that alerts the operator if an object is in the path of the machine.

**Cat Command for Compaction is not available in all regions or on all models. Contact your Cat dealer for availability.*

***Productivity improvement based on product testing of the Command for Compaction system and a novice operator on their first project not utilizing the technology when executing six machine passes in a defined area. Productivity measured as drum coverage and verified by recorded pass count percentages. Test conducted by Caterpillar at Tucson, AZ USA in November 2018.*

CAT COMPACTION TECHNOLOGIES FOR SOIL

Model availability and configurations may vary by region. Please check with your Cat dealer for specific offerings and availability in your area.

SYSTEM	MODEL	AVAILABILITY	APPLICATION	CONSIDERATIONS
Machine Drive Power (MDP)	CS11-CS20 CS10 GC-CS13 GC CS54B-CS79B CP11-CP16 CP11GC-CP13 GC CP54B-CP74B	Factory-installed or upgrade through your Cat dealer	Versatile tool that provides an indication of soil stiffness on a wide range of jobsites and soil types	• Compatible with padfoot or smooth drums and padfoot shell kits • Works in vibratory or static mode • Works in all soil types: granular, semi-cohesive and cohesive • Measures 30-60 cm (12-24 in) deep
Compaction Meter Value (CMV)	CS7-CS20 CS10 GC-CS13 GC CS44B-CS79B	Factory-installed or upgrade through your Cat dealer	For use on jobsites with granular soils such as sand and gravel and provides an indication of soil stiffness	• Compatible with smooth drums only • Requires vibration mode on • Works best on granular soils • Measures 1-1.2 m (36-48 in) deep (averaged reading of total depth read) • Excellent for finding soft soil conditions
Mapping	CS11-CS20 CS10 GC-CS13 GC CS54B-CS79B CP11-CP16 CP11GC-CP13 GC CP54B-CP74B	Factory-installed or upgrade through your compaction technology solutions provider	For jobs with an added focus on quality control, when documentation is required to ensure requirements are met, or to analyze work being done for consistent and uniform coverage	**Mapping Basic** • Satellite Based Augmentation system (SBAS) • Accuracy level of about 1 m (3.3 ft) • Requires access to regionally available satellite systems • Does not require off-board infrastructure • Requires a clear view of the sky—trees and tall buildings can interfere with satellite signals • Requires a VisionLink™ Performance Pro subscription for back-office connectivity • Data can be exported for further analysis **Mapping Advanced** • RTK Global Navigation Satellite System (GNSS) • Accuracy level of 1-3 cm (0.5-1.5 in) • Requires a correction source such as: base station, Internet Base Station Service (IBSS), Virtual Reference Station (VRS) or Real Time eXtended by Trimble (RTX) • Requires a clear view of the sky—trees and tall buildings can interfere with satellite signals • Requires a VisionLink Performance Pro subscription for back-office connectivity • Data can be exported for further analysis
Command Semi-Autonomous	CS12-CS19 CS56B-CS78B CP12-CP16 CP56B-CP74B	Upgrade through your Cat dealer	Automates vibration system settings, coverage and pass count for larger compaction jobs with multiple compaction lanes and longer passes	• Does not require a design file • Requires operator assistance to set up inputs and activate • Requires dual RTK connection • Connects to commonly-used base stations • Requires a clear view of the sky—trees and tall buildings can interfere with satellite signals • Integrated object detection system • Available on certain models and in select regions

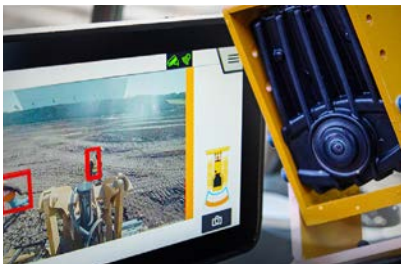
TECHNOLOGY KITS
SOLUTIONS TO HELP ENHANCE SAFETY

Jobsite safety requires constant attention. Cat Detect technologies help you stay vigilant. Using cameras and other sensors to improve operators' awareness of the work environment, Detect technology systems help increase awareness of potential blind spots and jobsite activities. Technology kits are compatible with all Cat soil compactors and other equipment brands with a 12- or 24-Volt DC system—making them a great choice for Cat or mixed fleets. Talk to your Cat dealer about available upgrades.



A VISIBLE DIFFERENCE

The Cat Detect with Rear Camera system is a safety kit that uses a rugged, vibration-resistant camera and a high-definition, touchscreen display to give operators a clear view behind the machine.



IMPROVE WORKER SAFETY AROUND EQUIPMENT

The Cat Detect with Smart Camera safety technology utilizes a smart camera, an in-cab display and alerts to help your operator keep track of people near the machine. The Smart Camera provides a 180-degree view and detects people around the machine using an algorithm, without the need for Radio Frequency Identification (RFID) wearables.



IMPROVE OPERATOR VISIBILITY AND PRODUCTIVITY ON THE JOBSITE

The Cat Detect with Surround Camera system uses four cameras and an in-cab display to give operators a view of their surroundings. The Surround Camera system provides operators with simultaneous, top-down views from the front, rear, left and right cameras.



BUCKLE DOWN ON SAFETY

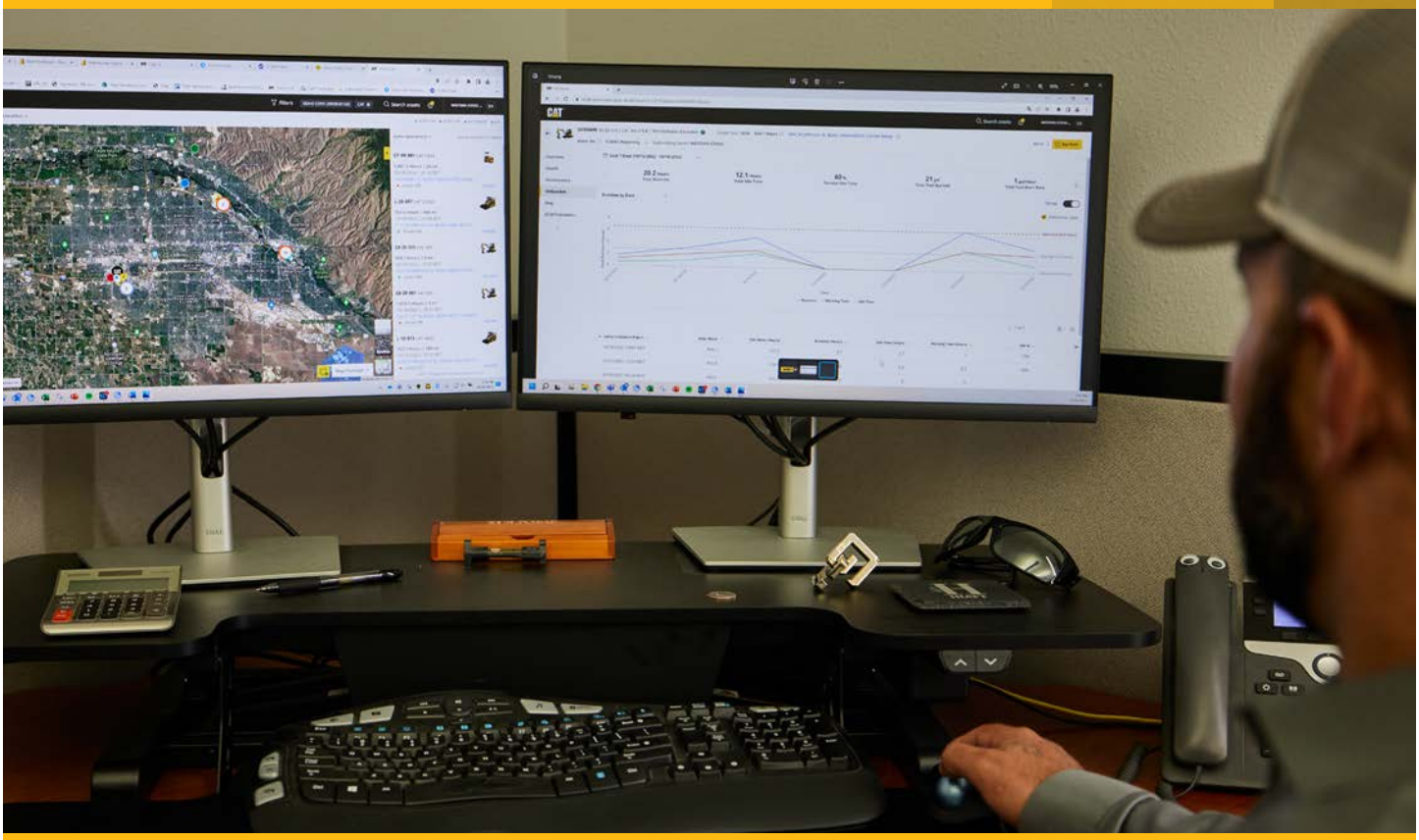
The Cat Detect Seat Belt Reminder uses audible and visual alerts to ensure operators stay buckled while operating equipment. The Seat Belt Reminder detects when the seat belt should be in use by monitoring the machine's parking brake switch and audibly alerts the operator if the seat belt is not buckled when the parking brake is disengaged. Connect the Seat Belt Reminder to VisionLink* for notifications and a log of instances to help maintain safety records.

** VisionLink is a subscription-based telematics software that delivers customizable dashboards with real-time updates on the condition of your equipment.*

VISIONLINK™

MACHINE AND JOBSITE DATA AT YOUR FINGERTIPS

VisionLink is a flexible and scalable cloud-based application designed to monitor all aspects of your operations, whether for individual machines or multiple interconnected job sites. It analyzes the collected data to provide insights into fleet utilization, compaction data and safety compliance. With VisionLink, you can make informed decisions that enhance operational efficiency and boost profits.



MAXIMIZE UPTIME

Monitor equipment health, fault codes, fluid analysis, and inspection due dates. Reduce unplanned downtime with critical alerts. Order parts and schedule service within the platform.

MAPPING DATA ANALYSIS

Access recorded mapping data for analysis, reference compaction quality and method spec information and pull reports of the work done. Data can also be exported through an Application Programming Interface (API).

OPTIMIZE UTILIZATION

Manage assets by projects, groups, or geofences. Set utilization targets and monitor performance. Make informed, data-based decisions to reduce operating costs.

PRIORITIZE SAFETY

Enhance operator awareness and worker vigilance on job sites by utilizing situational awareness alerts to mitigate risks and improve safety protocols.



CAT DEALERS

DEDICATED TO HELPING YOUR BUSINESS SUCCEED

When you select Cat equipment and technology, you benefit from the support of the largest and most experienced dealer network in the industry.

You gain a partner committed to assisting you and your operation at every stage. Whether you require expert advice or emergency service, your Cat dealer is there for you from day one.

Cat Compaction Technologies for soil may vary by region and model. Consult your Cat dealer for details.

For more complete information on Cat products, dealer services and industry solutions, visit us on the web at **www.cat.com**

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(Global excl. China)

Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat dealer for available options.

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