

REUSABLE PACKAGING MANAGEMENT

FOR AGROCHEMICAL INDUSTRY

SUPPLY CHAIN TRACEABILITY SOLUTION

TO INCREASE
VISIBILITY AND
EFFICIENCY

OPTEL's Reusable Packaging Management (RPM) solution allows manufacturers to track their reusable packaging from manufacturing sites to end user and back. Reusable packaging from the agrochemicals companies can consist of intermediate bulk containers (IBC), such as bins, tanks, bulk containers, drums and barrels. These reusable packaging items are designed to be recovered for multiple uses and to answer local regulations.

OPTEL's approach consists of combining reverse logistics traceability data capture and monitoring with supply chain visibility and mapping tools. Our technology stack includes hardware to capture accurate and reliable line data in real time at high speed, as well as software for data empowerment and visualization of the IBC routes.



VALUE PROPOSITION

RPM is a turnkey and scalable solution to optimize the life cycle of reusable packaging and IBCs. RPM provides visibility on asset inventory and location for better forecasting and helps reduce asset losses and costs. **It is a cost-effective solution with rapid return on investment** that is easy to implement. It can also help your brand leverage reusability to support your sustainability objectives. Added value options such as fraud detection, engagement programs and/or inventory level tracking can easily be added to the RPM solution.

ROI EXAMPLES FOR THE RPM SOLUTION

- Lower cost per trip
- Packaging total cost of ownership reduction
- Fleet management cost saving
- More trips per item
- And many more

HOW IT WORKS

The RPM solution uses data capture technology and powerful software for real-time data empowerment and visualization.

Assets can be tracked using a unique identifier printed directly on the asset or label (QR, Data Matrix, etc.) or an RFID or NFC that can be read by Internet of Things (IoT) devices.

These technologies can be combined for additional data monitoring (cold chain, temperature, freshness, consumption, etc.).

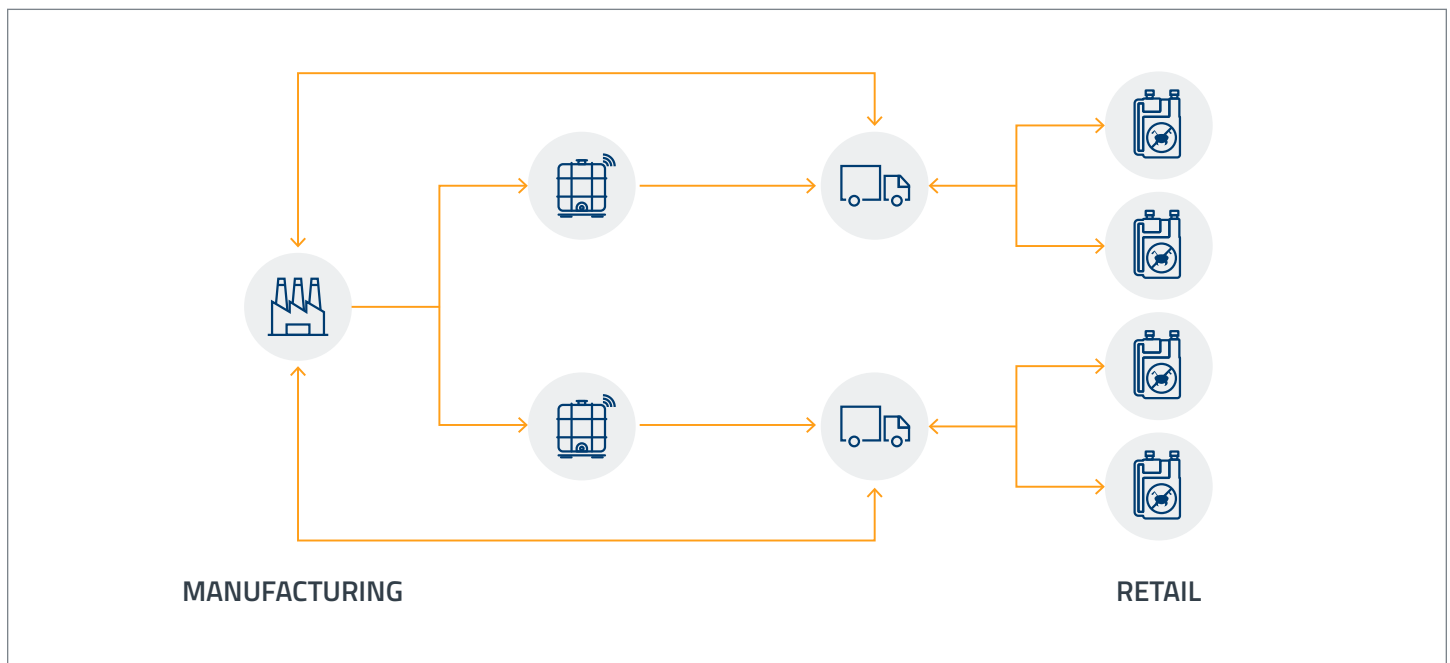


Figure: IBC traceability representation

KEY BENEFITS

- Reduce asset losses and costs
- Optimize asset life cycle
- Optimize supply chain operations
- Improve inventory management
- Reduce waste and carbon emissions
- Reduce operational costs
- Benchmark supplier performance
- Gather valuable market intelligence

KEY FEATURES

OPTEL's RPM solution was developed in partnership with leading brands. Key features were required for the solution's success in the food & beverage and agrochemicals industries:

- Real-time visibility on your asset fleet: dashboards and alerts
- Monitoring and mapping of asset locations, distributors and internal transfers
- Geolocation of items
- Tracking device/methods make the solution damage-proof and economical
- Simple and automated data collection
- Possibility to add customized metrics monitoring
- Interoperability with existing systems (ERP, API, WMS)

REUSABLE PACKAGING MANAGEMENT (RPM)

OPTIONS

The Reusable Packaging Management solution offers many options depending on your company's needs and goals. Each option offers added value based on the type and amount of data monitored and the number of touchpoints along the supply chain. (See the chart below.) The technology stack required for each option is similar: packaging identification (UID), camera, RFID reader, cloud database and mobile app.

Below are the main options. Each one includes the added value of the previous options: Option 2 includes the benefits of Option 1; Option 3 includes the benefits of Options 1 and 2, etc.*

OPTIONS	SOLUTION COMPONENTS	BENEFITS AND ADDED VALUE
1	<ul style="list-style-type: none">Life-Cycle Assessment	<ul style="list-style-type: none">Real-time visibility on fleetStrong analytics: Asset age, losses, durability, return rate, scuffing level and more
2	<ul style="list-style-type: none">Life-Cycle AssessmentInventory Level Tracking	<ul style="list-style-type: none">Fleet size and asset locationForecasting of new asset purchasesOptimization of sleeping inventorySupply chain monitoring
3	<ul style="list-style-type: none">Life-Cycle AssessmentInventory Level TrackingOperational Efficiency	<ul style="list-style-type: none">Performance and planning of cleaning processQuality control and maintenanceChannel visibility for optimizationPre-planning of end of life: automatic reject of bad bottles on the lineSupplier benchmarkingReduction of cross-contamination risk
4	<ul style="list-style-type: none">Life-Cycle AssessmentInventory Level TrackingOperational EfficiencyCarbon Footprint Assessment	<ul style="list-style-type: none">Improved carbon footprint of productCircular economy: management of packaging's end of lifeMonitoring of impact of various programs on return rate
5	<ul style="list-style-type: none">Life-Cycle AssessmentInventory Level TrackingOperational EfficiencyEngagement Program	<ul style="list-style-type: none">Increase return rate with engagement and reward programsBuild brand loyalty with incentives for consumersMonitor impact of various programs on return rateGather market and consumer analytics

* Other tailored options are available.

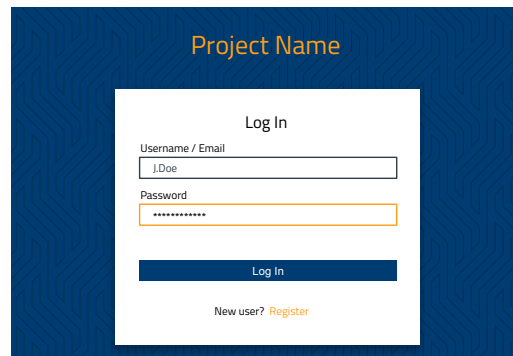
SOLUTION OVERVIEW

USERS HAVE ACCESS TO CLOUD REPORTING THROUGH WEB AND MOBILE APPS.

EXAMPLE OF WEB APP

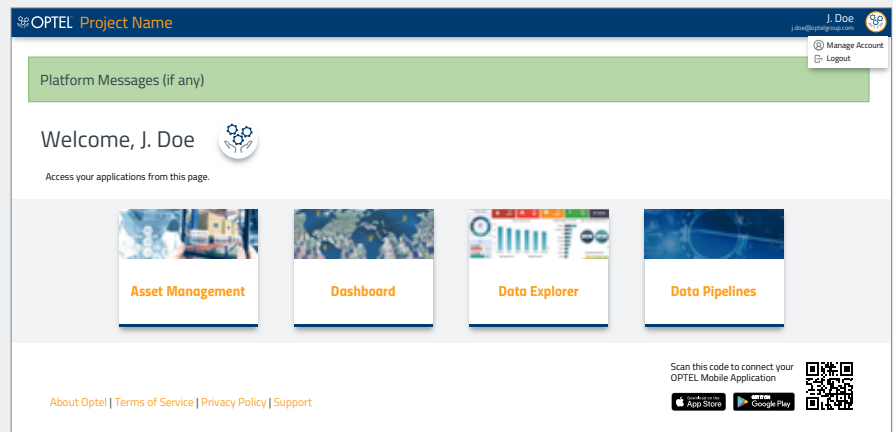
Logging In

- Users must log in to access the platform.
- User registration can be enabled or disabled per project.
- Users can log in with other identity providers such as Google, Facebook, etc., or a corporate directory that supports OpenID Connect or SAML 2.0 (e.g., Microsoft Active Directory)
- Log in page look and feel can be modified per application.



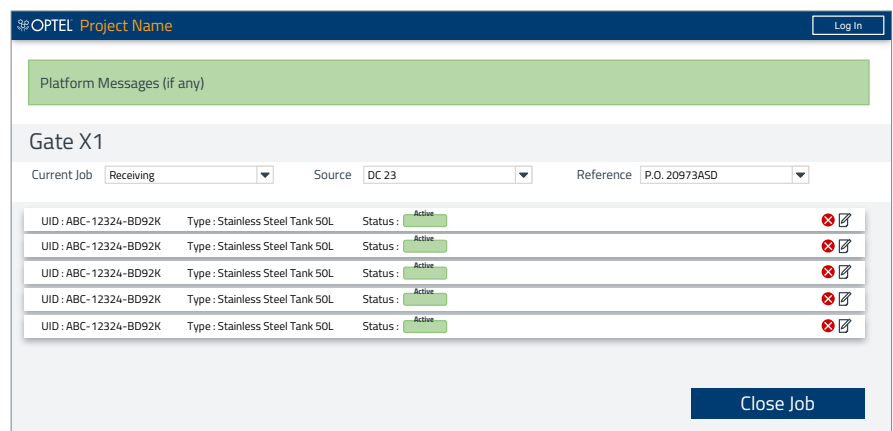
Default Landing Page

- Users who do not log in to a specific application will be taken to the default landing page.
- The selection of applications depends on user access.
- Third-party applications can be added to strengthen OPTEL's presence in users' workflows even when they use other applications.
- Platform messages can be defined by the platform administrator or by OPTEL for issue reporting or maintenance communication purposes.



Kiosks (Protected Web Apps)

- Protected web portals are applications that must be physically protected from being accessed by unauthorized personnel.
- No user authentication is required. The required security keys are contained on the device the application runs from.
- They are used to allow operators to interact with the platform from a dedicated, strategically positioned terminal.
- Some operations require a user to log in, such as maintenance and configuration.



SOLUTION OVERVIEW

EXAMPLE OF MOBILE APP

- The mobile application must be connected to the platform. This allows us to manage a single application for all use cases and projects.
- Upon connection, the application will allow the user to log in to the platform and display the mobile applications the user can access.

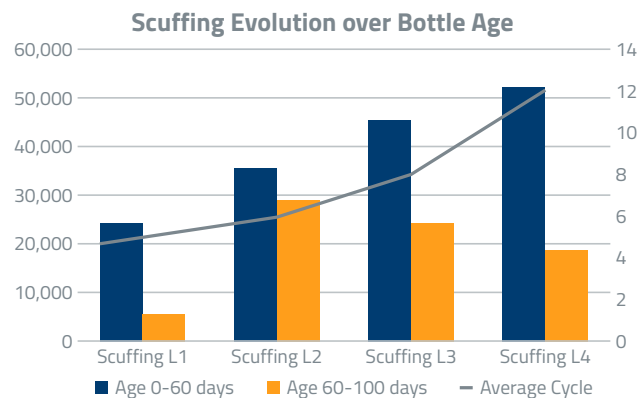


MANUFACTURER DASHBOARDS - INVENTORY OF REPORTS

SCUFFING LEVEL FOR BOTTLES

UID	Scuffing Level	TimeStamp
7411159353072804	3	2020-07-28 10:27

Table view of assets with scuffing score: Application specific. Superset use case.



Scuffing evolution over RGB age: Application specific. Superset use case.

Cycles per Bottle (Total)

Total cycles per bottle, regardless of interval

Inspect Count: 301,299

Serial Number	Company	Bottle Production Date	Last Seen On	Cycle Count	Bottle Age (Days)
			Aug 15, 2020	10	27
			Aug 26, 2020	1	11

Cycles per Asset with breakdown of individual asset. A cycle is when a reusable asset goes through a specific event (e.g., filling).

Bottles per Day/Hour

Total inspections per day and per hour

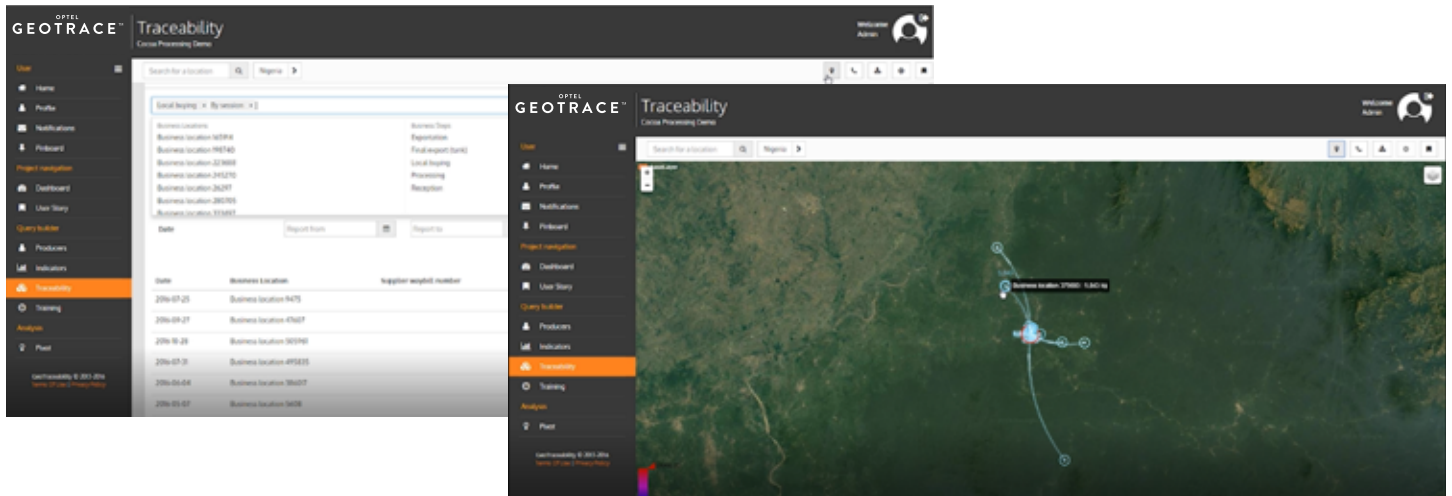
- To drill down, select a day by clicking in the chosen date/bar, then right-click and select Drill down
- To reset view, right-click on the graph, the select Reset action.

Inspect Count: 301,299

Event count per readpoint per period

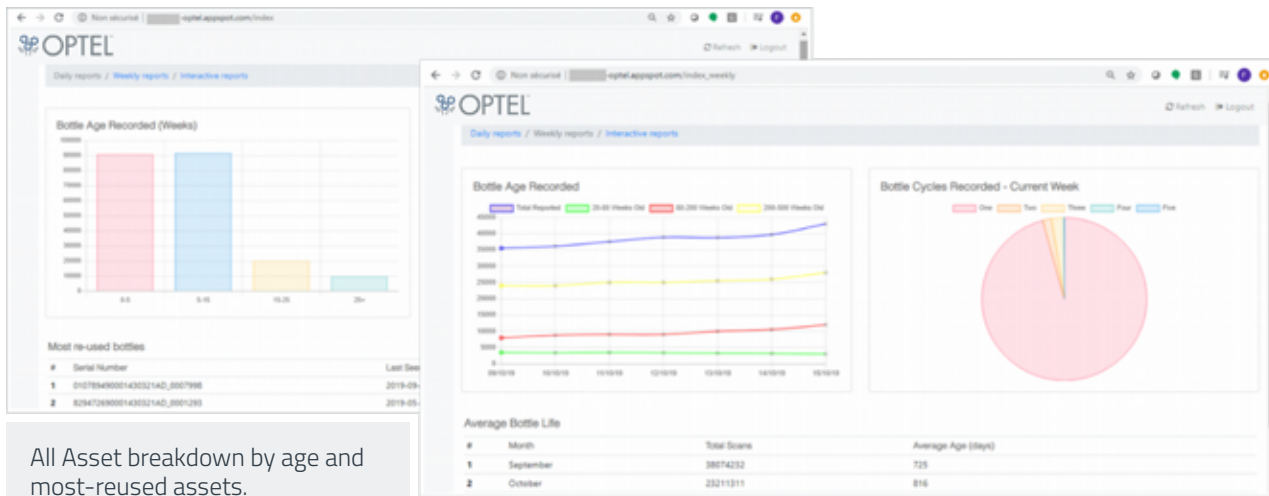
SOLUTION OVERVIEW

ARRIMAGE TRACKING



No expressed reporting requirements. Solution aimed to leverage GeoTrace, so would be aligned with the Basic Asset Event Timeline and generic reporting capabilities in Superset.

CRATE TRACEABILITY EXAMPLE



All Asset breakdown by age and most-reused assets.

Asset activity time series with breakdown per age and exceptions. Also, events and average asset age per month in table view.

Cycles per active asset over a period of time

List of Crate Not seen for more than 30 days

Crate UID	Last Time Recorded	Last Location Recorded	Saputo ERP reference
355R-79KB85H4	2020-06-22-14:40:57	Dock #3 at VDC	Delivery to Francis's Retail Point
68E3F766X53M	2020-06-22-14:41:03	Dock #15 at VDC	Delivery to Carlos's Retail Point
82W5953287D1	2020-06-22-14:41:07	Dock #21 at GT	Delivery to Carlos's Retail Point

Logic
At time 2020-06-22 14:40:57 on Dock #3 at VDC, Work Order 2546 was being completed. Work Order 2546 is linked to delivery to Francis's retail point.

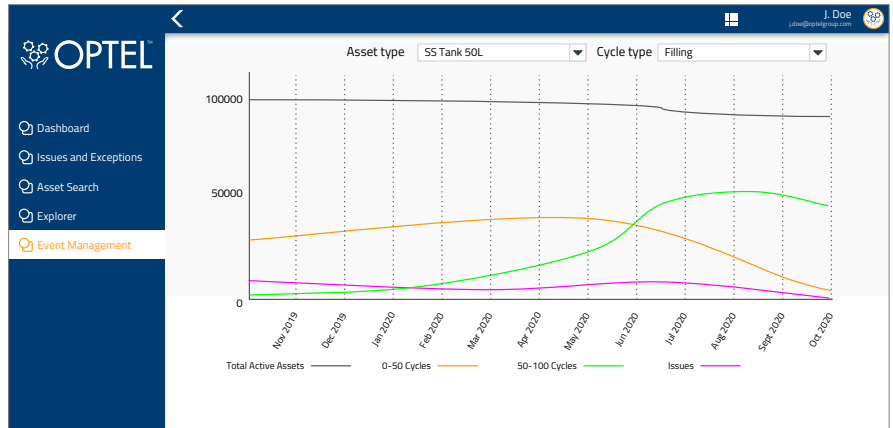
Done Manually for the Pilots

Asset without events for X days with reference to last event context

SOLUTION OVERVIEW

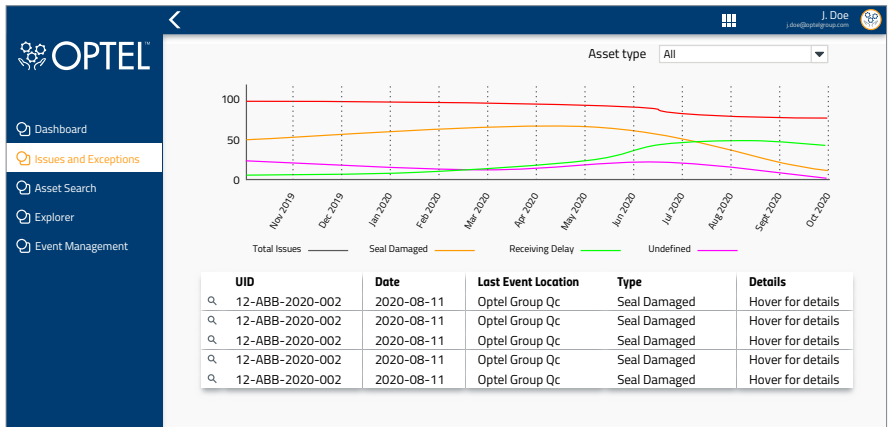
ASSET ACTIVITY (EVENTS) TIME SERIES WITH BREAKDOWN PER AGE BRACKET AND EXCEPTIONS

- Shows active assets over time
- Shows the breakdown in cycle count of those assets
- Cycle count type is selectable (e.g., Shipping vs. Filling)
- Cycle count type selection automatically adjusts based on known event types
- Asset type can be filtered



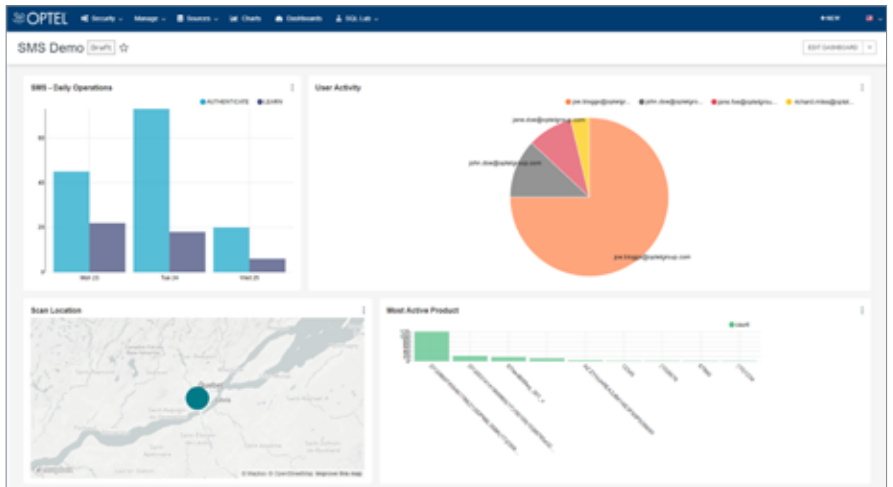
EXCEPTION EVENTS LIST WITH EVENT CONTEXT FOR A TIME PERIOD

- Issues Breakdown
- Automatic listing of issue type based on reported issues
- Filterable by asset type
- Ability to examine asset (navigates to Asset Search with Asset preselected)



CUSTOM REPORTING CAPABILITIES IN SUPERSET

- Data explorer with SQL Lab
- 48 chart types including tables, maps and sankey diagrams
- Dashboards can be accessed from external applications
- Ability to upload CSV data
- Ability to export charts and SQL Lab results to CSV
- Ability to integrate with external databases (MS SQL, PostgreSQL, MySQL)





OPTEL'S INTELLIGENT SUPPLY CHAIN®

The Reusable Packaging Management solution is a module of OPTEL's Intelligent Supply Chain® (ISC), a powerful traceability platform. The ISC can digitize supply chain operations from raw materials to end user, enabling real-time visibility throughout the product life cycle by capturing and empowering data at every step of the value chain. Multiple modules make up the ISC platform, helping businesses solve issues related to supply chain and operational efficiency, product safety and integrity, sustainability, brand protection and authentication, compliance and user engagement.



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ABOUT OPTEL

OPTEL is a global company with manufacturing sites on four continents and 600 employees around the globe. The company has 30 years of proven expertise in developing and deploying track-and-trace, vision and traceability systems for the world's leading pharmaceutical, food and beverage, and agrochemical brands. OPTEL is a Certified B Corporation and co-founder of the Canadian AI supercluster for supply chains (Scale AI).



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