



Integrated spare parts management

Reducing costs and inventories sustainably in four steps

Tackling the cost driver spare parts management

Spare parts management for machinery and equipment is challenging for manufacturing companies, especially in the automotive industry, where small parts often have to be replaced. Analyses by the two partners SPARETECH and Leadec show that the average inventory of a global industrial company amounts to more than 109 million euros and increases by up to 12 percent annually. Some manufacturing companies have more than 140,000 material numbers in their systems.

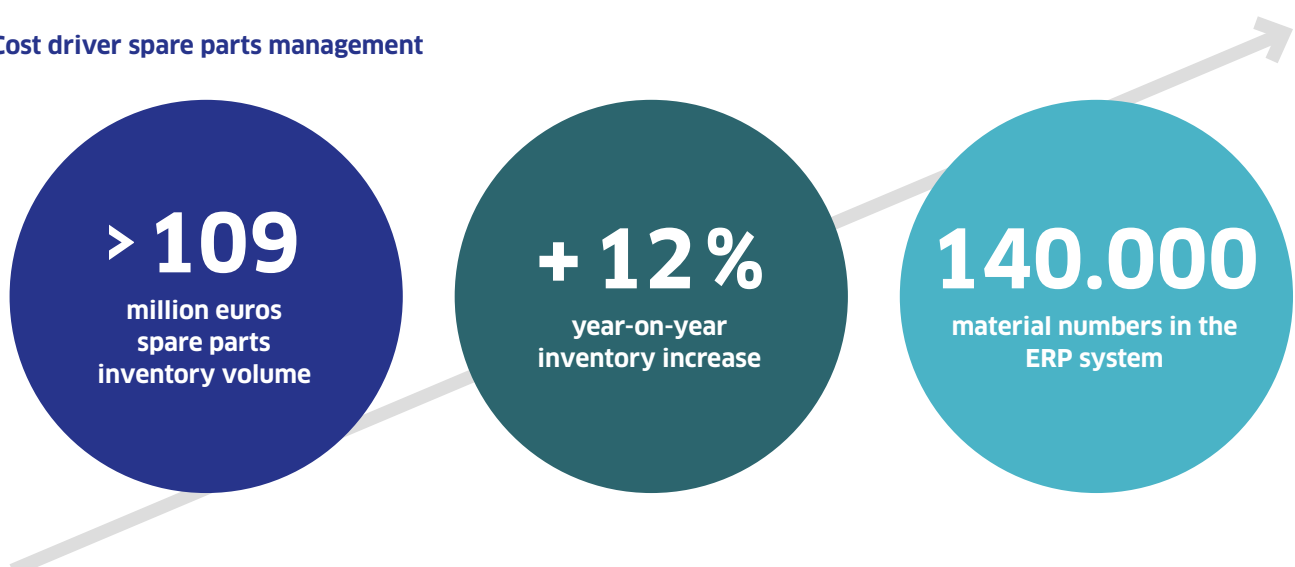
To be able to react quickly in the event of production downtime, companies have many spare parts in stock. Until now, there has been no transparent data on which spare parts are available at which location. And this is despite the fact that the common parts rate is 15 to 25 percent at many companies. In some cases it is over 40 percent. This is mainly due to poor data quality: Up to two thirds of all data records in the ERP system are incorrect. Typical sources of error are missing information, inconsistent spelling, hidden duplicates or recoded data records.

The inconsistencies in the spare parts master data make it more difficult to consolidate inventories and reduce procurement costs. In addition, the different sites' poor material master data quality makes it difficult to carry out a spare parts analysis in line with requirements, to integrate new equipment and to enter new spare parts without duplicates. Language differences, different data formats and structures represent additional challenges and increase complexity, especially for global suppliers.

In this context, key figures relevant to the company are:

- Spare parts inventories (working capital)
- Procurement costs for spare parts
- Machine downtime due to missing spare parts (downtime costs)
- Manual effort for spare parts data management (personnel costs)

Cost driver spare parts management





Global warehouses with spare parts inventories using the example of an automotive manufacturer - opportunities through change from CAPEX to OPEX



Business impact



Working capital



Procurement costs



Downtime risks



Manual effort

High costs due to missing data

Leadec and SPARETECH have jointly identified the significant causes behind the complexity drivers. Inventories increase in particular because spare parts are often procured together with plant and equipment. And this happens well before they are actually needed. The background to this is that these stocking decisions are usually not data driven, but are made on the basis of expert estimates from the maintenance department. The unsatisfactory data quality of spare and wear parts lists makes it laborious to check whether the required spare parts are in stock. As a result, duplicates are unintentionally stored in the warehouse and procurement costs increase. Additionally, companies find it difficult to compare alternative

procurement sources for new spare parts because there is insufficient transparency on the market. At the same time, from an economic point of view, not all spare parts can be kept in stock. Therefore, machine downtimes occur time and again because an urgently needed spare part is not available when needed or cannot be found in the company's own warehouse.

Entering new spare parts data in the system and maintaining it over the entire life cycle, both of which is often still done manually, ties up personnel resources. Due to the high data volume, this process can hardly be managed without digital software support.

Root causes

No data-driven decisions to quantify the likelihood of use

Poor data quality - parts are not comparable

No systems & processes in place to enable network pooling

No software solution to digitize workflows

Key problems

Spare parts are purchased based on estimation before they are needed as insurance against failures

Available inventories at other production sites are not considered before purchasing

Quick search for and identification of parts at other sites is not possible

Overwhelming complexity of managing spare parts data manually

Business impact

Working capital



Procurement costs



Downtime risks



Manual effort



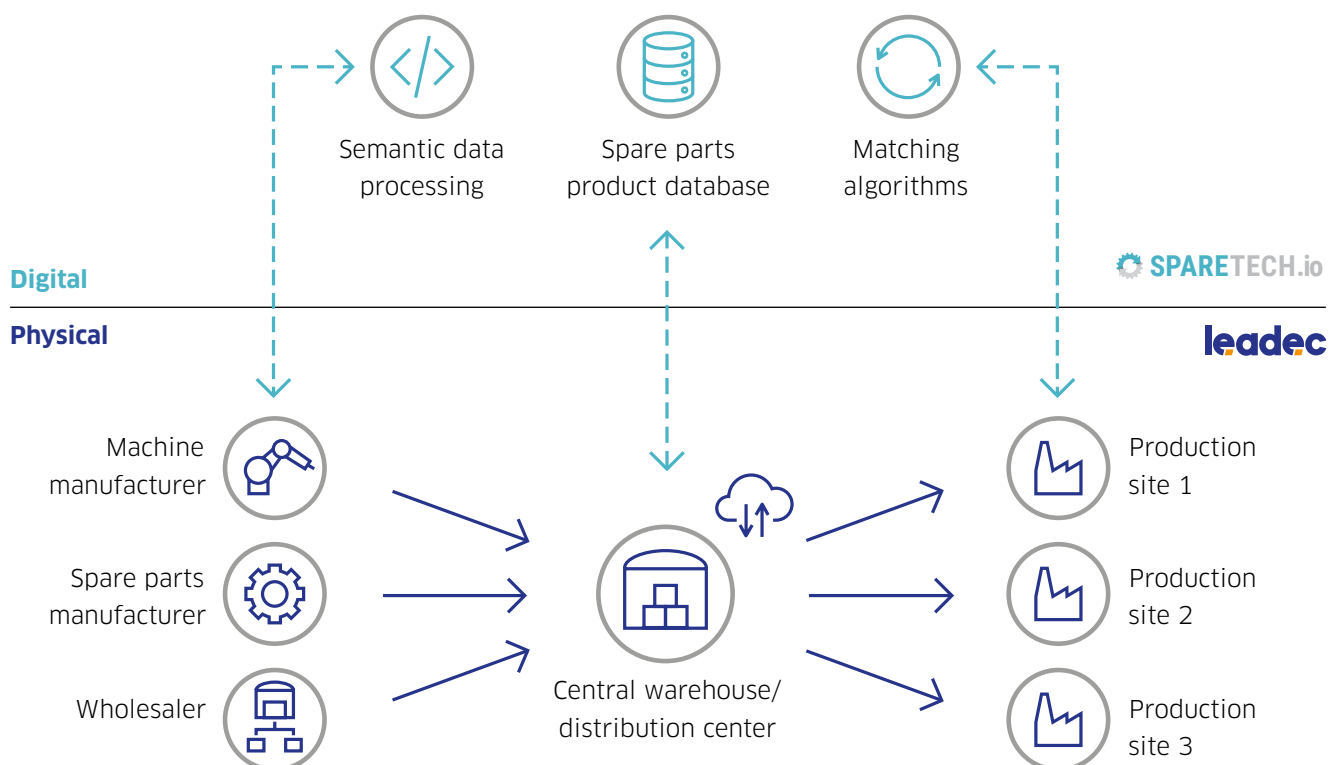
The solution: integrated spare parts management

To meet these challenges, SPARETECH and Leadec are pooling their expertise and jointly offering integrated spare parts management. SPARETECH provides the necessary data base with its software while Leadec is responsible for on-site spare parts management and production equipment maintenance.

This combination of digital and physical spare parts management reduces costs and increases plant availability. This is because the availability of spare parts can be increased to over 99 percent. At the same time, it is possible to reduce working capital (spare parts inventories) by up to 90 percent.

In this way, data-driven decisions become possible so that inventories in the global production network can be reduced.

The diagram below shows how exactly the cooperation between the two partners works. The central warehouse or distribution center is the linchpin of integrated spare parts management. The solutions from Leadec and SPARETECH support the process along the entire value chain.



Integrated spare parts management in 4 steps

Leadec and SPARETECH have defined a 4-step process for the introduction of integrated spare parts management. Each step is substantially generating value. In this way, the advantages of integrated spare parts management can be realized step by step. In the short term, the 100 % identification of spare parts results in savings potential by means of digital life cycle management and warehouse optimization across sites. In the medium term, it pays off for manufacturing companies to out-

source their inventory because it can save considerable costs in various areas.

As a long-term goal for optimization, the implementation of an availability platform is a sensible final step. This allows the availability of spare parts and ultimately of production facilities to be guaranteed thanks to cross-company networking.

Short term

Medium term

Long term



**100 %
identification**

1

Data optimization through **digital workflows** and **data life cycle management**



Inventory pooling

2

Warehouse management across sites to reduce inventories



Off-balancing

3

Outsourcing of ownership and responsibility for spare parts inventories (off-balancing)



Availability platform

4

Guarantee of availability with cross-company networking

Step 1: 100 % identification

In the first step, the SPARETECH software clearly identifies the spare parts. For this purpose, semantic data management, big data and automated data processing technologies are used. The software identifies master data records based on the original manufacturers' product information. In particular, incorrect information on manufacturer names, model designations, article numbers as well as short and long texts are corrected. This indexing is done on the basis of a unique SPARETECH ID. It contains all detailed information about a product, including all technical features, original manufacturer designation texts, ECLASS ID and EAN (if available from the manufacturer) as well as information about available procurement sources. In this way, a duplicate-free and complete product data base is created, which enables comparisons across sites. The following illustration shows this topic using a concrete customer example.

SPARETECH clarifies technical questions directly with the respective original manufacturer. This includes, for example, information on product configurations that

are not specified in the operator's material data description. Often, this data can be provided by the original manufacturer based on the order history.

In addition to indexing and data preparation, discontinued components are identified. During the obsolescence check, these products, which the relevant manufacturer no longer sells, become visible at the push of a button. For these products, the SPARETECH software provides the original manufacturer's information on available successors, service life and reparability. This enables a data-based decision in the operator's appropriate department and proactively avoids downtime risks.

Thanks to an error-free and up-to-date material data base, urgently needed materials can be found quickly in the event of an incident. Furthermore, the information base of the SPARETECH database enables procurement costs to be reduced because alternative sources and suppliers are visible at the push of a button.

5
different sites use
the same spare
part

ORG ARTIKELNUMMER	Hersteller	Artikelnummer	Beschreibung	Language Description	Beschreibung - Zeile 2
15052285	Siemens AG	6AV21240GC01-0AX0	Bedienpanel		MTC-Anlage
5052285	Siemens AG	6AV21240GC01-0AX0	Bedienpanel		MTC-Anlage
5066020	Siemens AG	9999	6AV2124-0GC01-0AX0		SIMATIC HMI TP700
15092586	Siemens AG	6AV2 124-0GC01-0AX0	PANNELLO TP200 COMFORT		6AV2 124-0GC01-0AX0
1	Siemens AG	6AV2124-0GC01-0AX0	TP700 Comfort		PROFINET / MPI/PROFIBUS-DP

SIEMENS
Visualization panel
Price: €1,066

Different spellings make it more difficult to detect duplicates using standard methods.

Different languages and conventions

Hidden common parts across sites



Step 2: Inventory pooling

A complete and error-free data base is a basic prerequisite for defining and implementing an optimal procurement and stocking strategy.

The first step is a comprehensive analysis and evaluation of plant and equipment according to criticality. Production-relevant systems are given a high priority, especially bottleneck machines, the failure of which may result in a standstill of the entire production. Spare parts for these machines must be available at all times. Other important aspects are the analysis of the supplier base and the replacement cycles in order to identify where and how quickly the desired parts are available.

In the next step, a warehouse strategy is defined in order to create the appropriate structures for stocking. Depending on the type of parts (ABC/XYZ) and taking into account the required response times, a decision is made regarding the degree of warehouse centralization and automation. In addition to classic stockpiling, Leadec also offers consignment models in which the customer only incurs costs when the parts are actually consumed. With tens of thousands of items in the warehouses, this significantly reduces the customer's financial risk.

By means of a multi-site warehouse management system, in which several plants use a central spare parts warehouse (inventory pooling), Leadec ensures further savings, using synergies in inventories, process and organization. As a result of the intelligent warehouse

management planning, working capital is already reduced significantly.

By linking warehouse management with real-time maintenance data, further savings potential is achieved. The Leadec.os IT platform digitizes all service processes. Machine, product, quality and sensor data are brought together, analyzed and interpreted in the Leadec IoT-Home-Cloud. In this way, Leadec creates maximum transparency regarding the planning and documentation of all services and thus also the need for future spare parts.

Moreover, the resulting preventive maintenance measures can further reduce downtimes. This combination of maintenance and spare parts logistics from a single source offers an added value that quickly pays off in view of the costs of production downtimes of 2,000 euros and more per minute in the automotive industry.



Step 3: Off-balancing

Leadec and SPARETECH already have an eye on the spare parts management of the future now. In the medium term, a complete data base and inventory pooling will allow risks to be assessed and open up further optimization opportunities. Possible options are, for example, a shift of inventory back into the supply chain or the complete takeover of material stocks in order to make spare parts procurement even more flexible. In combination with intelligent production equipment maintenance, this will make project delivery models for production plants and spare parts warehouses attractive in the medium term and further optimize the use of capital. These outsourcing options enable manufacturers to reduce their balance sheet total (off-balancing).

Step 4: Availability platform

In the long term, Leadec and SPARETECH are building an availability platform across different customers within an industry sector. In this way, they are networking the players to implement network economies of scale for all participants. On-demand delivery of spare parts and financing models can reduce working capital by up to 90 percent while allowing for higher availability in production.

Great savings potential for companies

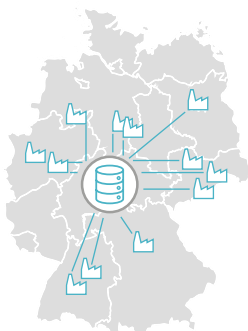
Joint analyses by SPARETECH and Leadec show that automotive manufacturers have the greatest pooling potential for machine and equipment spare parts, with an average common parts ratio of 23 percent across 350,000 material numbers in the production network. Measured in terms of inventory value, this amounts to up to 87 million euros. A large part of this inventory volume represents an automotive manufacturer's potential working capital savings after passing through all four steps of integrated spare parts management.

As regards tier 1 automotive suppliers, the common parts ratio across a company is about 19 percent. This corresponds to a pooling potential of around 9.5 million euros per company group. One of the reasons for this is that the average amount of material data is more than five times lower than that of automotive manufacturers.

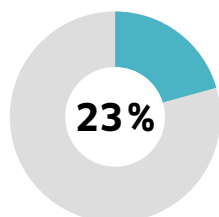
In the consumer goods industry, where a group of companies manages an average of 93,000 items of material data, the common parts ratio is around 16 percent. This corresponds to an outsourcing potential of spare parts inventories of around 9 million euros.

The first pilot projects in the automotive industry are already being implemented by SPARETECH and Leadec. Particularly in the case of start-up projects, the use of the solution pays off as soon as the first spare parts lists are checked, as fewer investments are made in spare parts inventories. In addition, customers benefit from lower production costs: These are achieved by combining more efficient spare parts management with data-based production equipment maintenance. Downtime decreases, quality increases and companies have to invest less. The combination of digital and physical spare parts management holds great potential for manufacturing companies. Step by step, they can reduce the capital tied up by high inventories by up to 90 percent and at the same time achieve spare parts availability of more than 99 percent. Integrated spare parts management gives them more flexibility, reduces risks and allows them to concentrate on their core competencies.

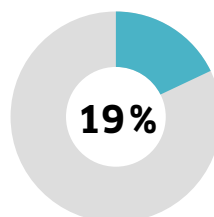
Network analysis



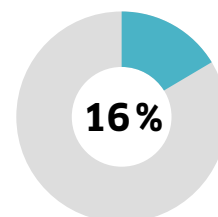
Automobile - OEM



Automobile - tier 1



Consumer goods



- Common parts ratio across sites
- Individual spare parts for each site

Spare parts pooling potential

About Leadec and SPARETECH

For almost 60 years, Leadec has worked as a service specialist for factories across their entire life cycle and related infrastructure at more than 300 sites worldwide. New technologies are making factories smarter – and with them the associated services, which are increasingly data driven. Among other things, Leadec is responsible for maintenance and spare parts management for major automotive manufacturers. All services are digitized end-to-end via the Leadec.os platform. This also includes Leadec's own IoT platform for the data-driven integration of maintenance and spare parts management. Together with SPARETECH, Leadec aims to improve internal logistics and optimize production equipment maintenance. Leadec's long-standing customers include, for example, the VW Group and Daimler.

SPARETECH, as the leading provider of spare parts availability on the market, brings its digital expertise to the partnership. This includes not only a digital workflow for the creation and continuous maintenance of spare parts master data, but also algorithms to remove duplicates from new spare parts lists and existing master data records. At the same time, this guarantees complete product data in the end customers' systems. Customers include leading international industrial companies such as Porsche, Volkswagen and Bosch.

www.leadec-services.com
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