ACCELERATE YOUR LOGISTICS 4.0

DRY TOWER

SUPER DRY®
Totech EU®

MORE THAN JUST DRY AIR

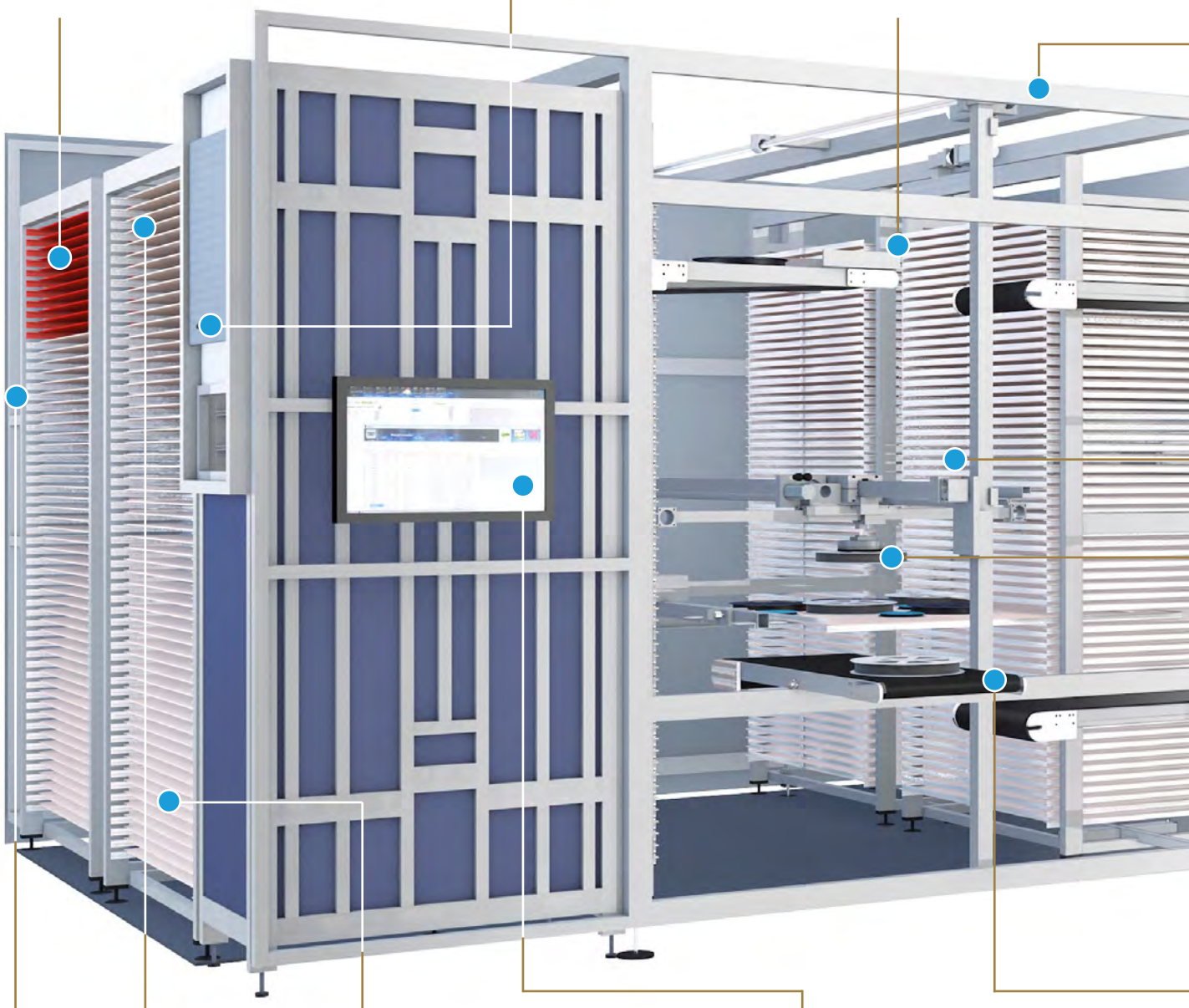
DRY TOWER

THE SYSTEM

Process-optimized re-drying at 60 °C and ultra-low residual moisture content <1% RH allow the user to quickly reset the floor lifetime in an individually air-conditioned segment of the cabinet.

Interim storage in accordance with the paternoster-approach allows for placement of components into storage while others are being simultaneously removed from it.

All containers within the system are optically measured to facilitate their volume-optimized storage.



Height of the storage racks available up to 6 meters.

The drawer height inside the storage rack can be increased in 5 mm-steps up from 25 mm.
The storage rack can thus be perfectly adapted to the packages to be stored.

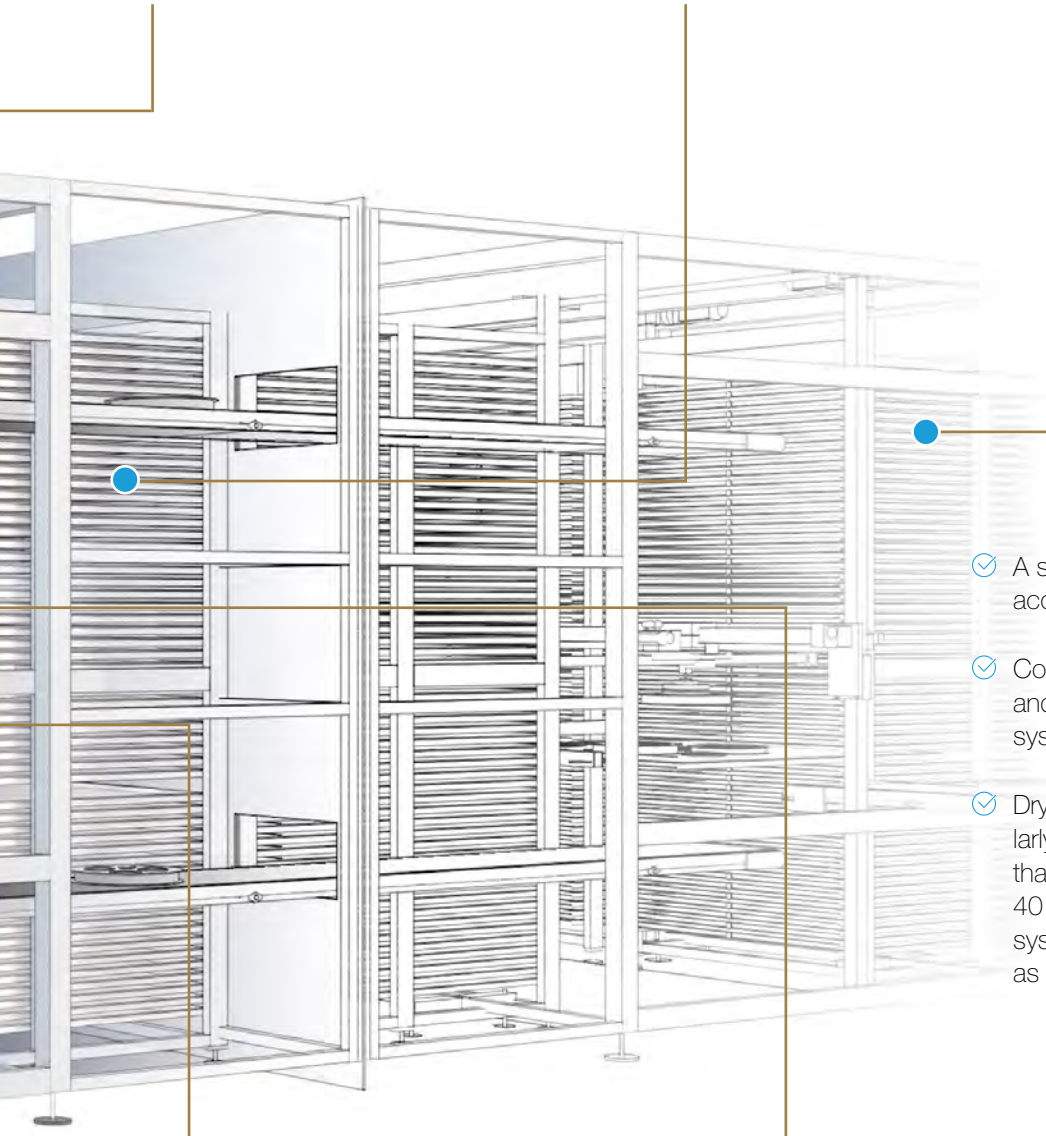
A terminal for redundant control computers has been installed right next to the robot. They parameterize the robot and facilitate manual access to the stored content.

ESD-proof construction of robot and housing.

Heavy-duty profile structure with linear guides serves to reduce the moved masses.

Drawers with a surface of up to 1.5 m² can be individually arranged at height-steps of 5 mm to facilitate best volume utilization.

Unlimited extension options by combining various modules.



- A side door provides convenient access to service the system.
- Controlled by two parallel computers and UPS for ensured & extremely high system availability of > 99%.
- Drying unit of series U-7000 for particularly effective dehumidification of less than 5% RH. Optionally available with 40 °C heater that tempers the entire system (Re-drying of moist packages as per IPC standards).

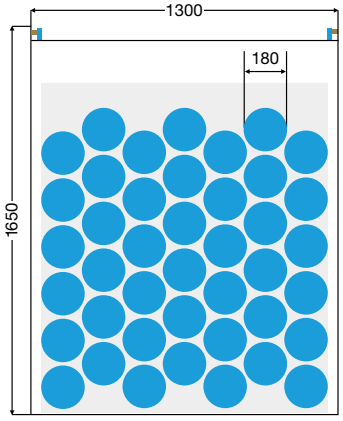
Conveyor lines ensure the quick input and output of goods. A combination of switches and lifts allows for the automatic supply of even distant removal points e.g. right at the line's supply - within just a few seconds.

Special vacuum gripper for reels, trays and boxes of small parts.

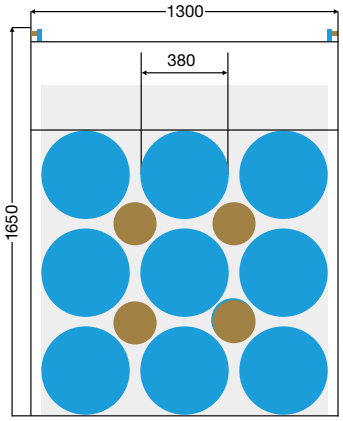
Energy-efficient and low-maintenance drive technology serves to transport packages with high-quality drives "Made in Germany".

DRAWERS

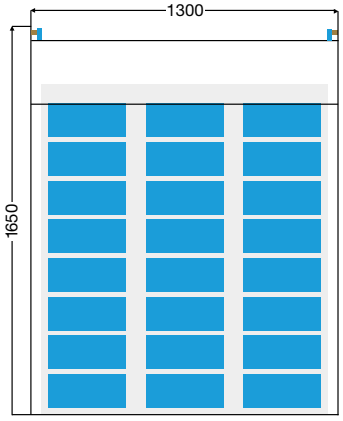
MAXIMUM VOLUME CONSOLIDATION



DRAWER LAYOUT **WITH 7” REELS**

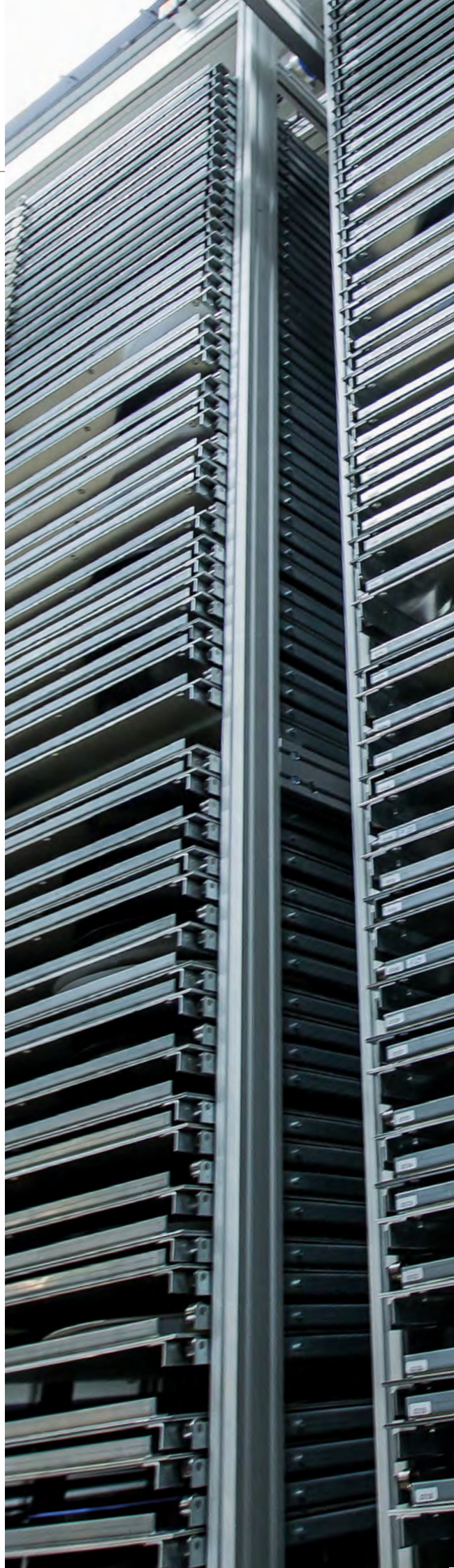


DRAWER LAYOUT **WITH 15” AND 7” REELS**



DRAWER LAYOUT WITH
STACKED TRAYS OR BOXES OF SMALL PARTS

Sample layouts.
Drawer layouts can generally be customized.



STORAGE CABINETS

UNLIMITED STORAGE IN 3 DIMENSIONS

Each cabinet comes with a maximum surface area of 2.2 m² and - depending on its height and the size of stored packages - accommodates up to 125 drawers with a total utilizable storage area of 210 m². For each cabinet, this means 5,250 reels* if stored individually or 10,375 reels* in case of twin-storage.For single-storage, the drawers have been equipped with anti-slip mats; for twin-storage they provide locating pins.

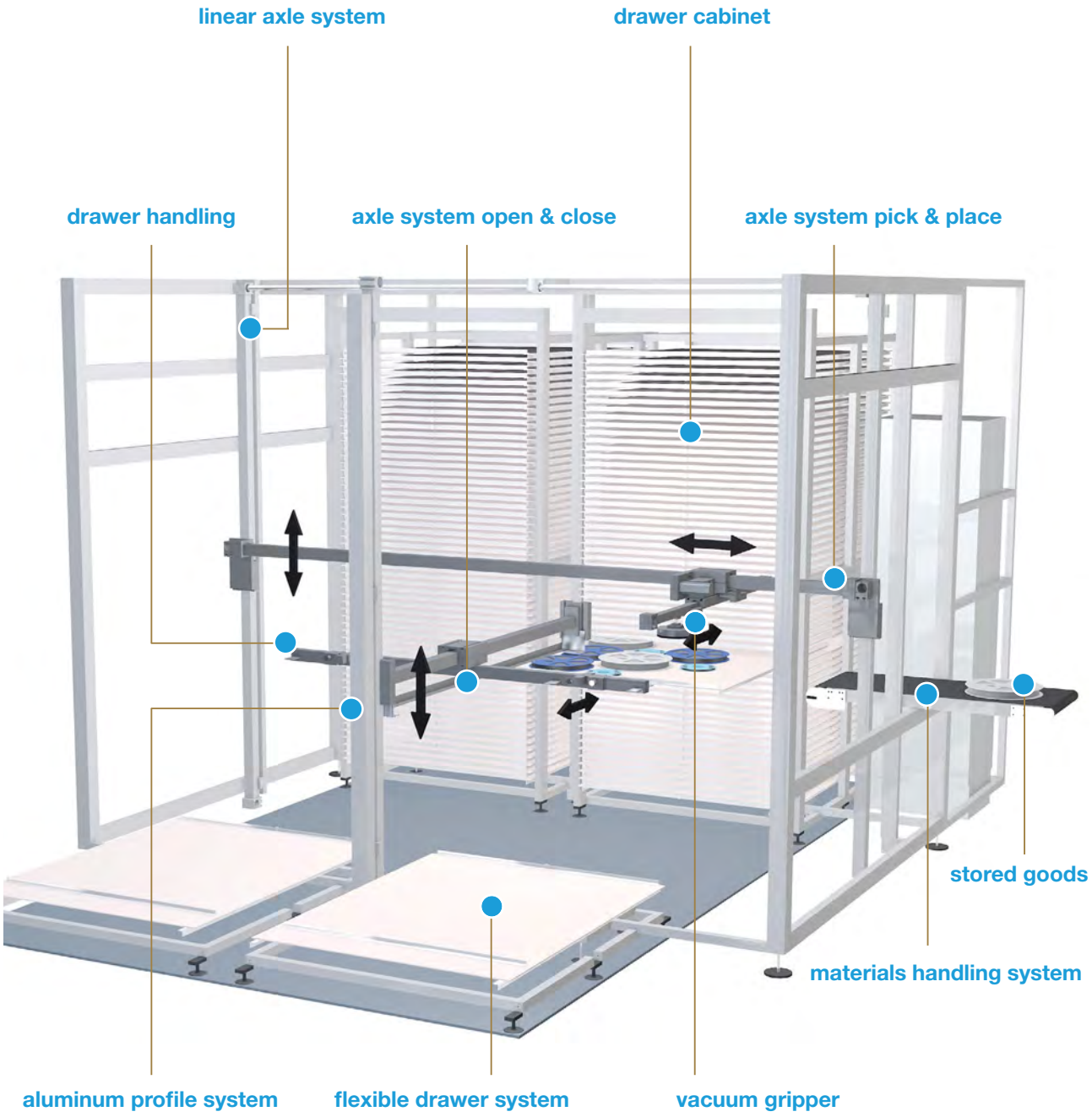
YOUR BENEFITS:

- manual removal possible, if necessary
- reliable, highly advanced technology
- maximum volume consolidation
- quick access

* refers to reels of 7“ in diameter and maximum 15 mm height

THE AUTOMATIC STORAGE SYSTEM

QUICK MATERIAL HANDLING



5 - AXIS GRIPPER SYSTEM

GENTLE COMPONENT TRANSPORTATION

The gripper systems are driven by low-noise and low-maintenance servomotors and move simultaneously within a 5-axis system. Vacuum grippers transport component packages like reels, trays or boxes quickly and safely.

Maximum loads of up to 3 kilos are possible.

YOUR BENEFITS:

- short access time
- safe and gentle transportation
- reels, trays and other unopened packages can be moved

INTERFACE

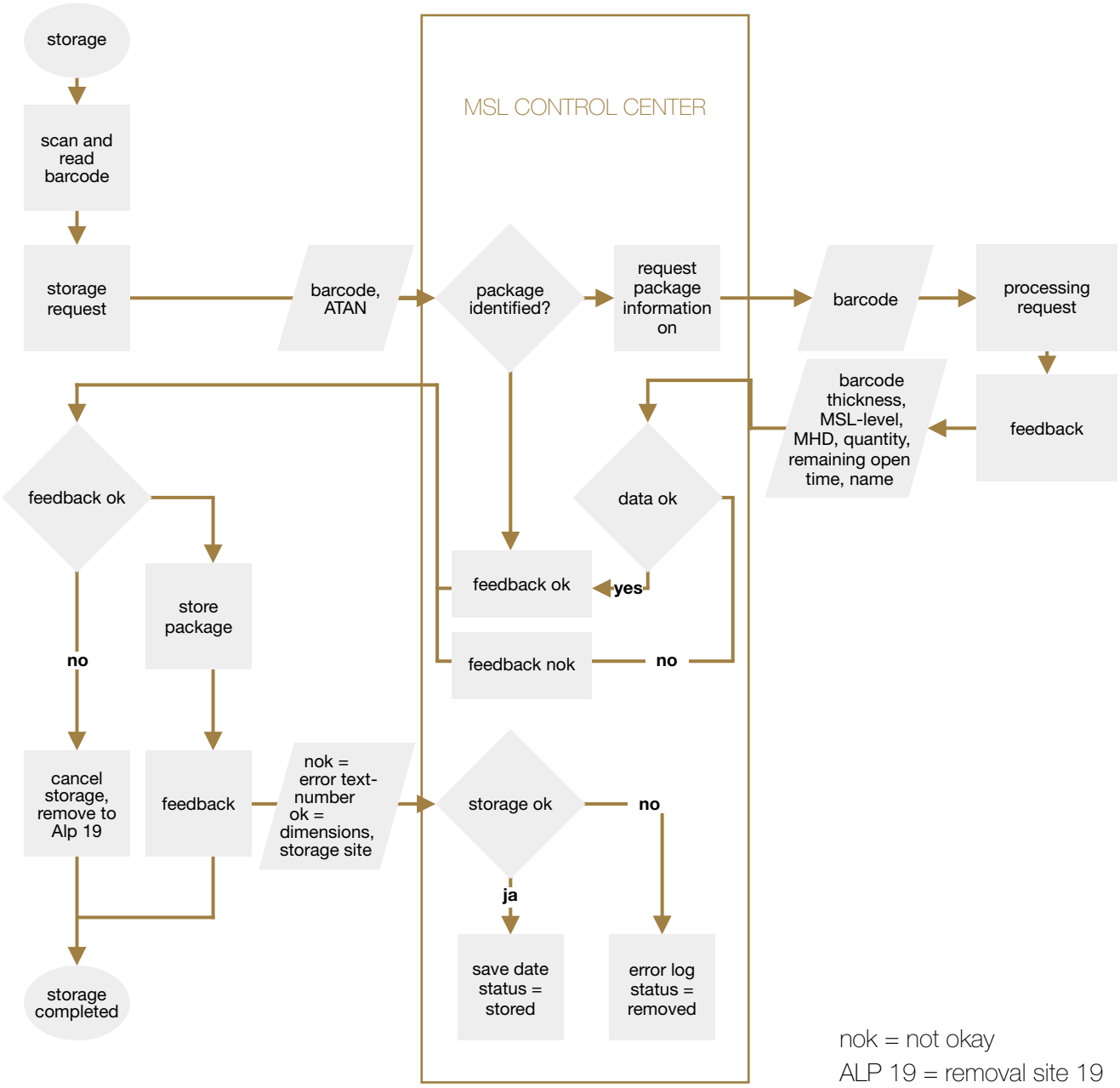
SMART COMMUNICATION

DRY TOWER

STORAGE CONTROL

INTERFACE

SAP



nok = not okay
ALP 19 = removal site 19

*Sample layout of interface communication between Dry Tower and MES system (storing process).

SOFTWARE

PERFECT DOCUMENTATION

Connection to interface: our interfaces have been designed in accordance with the guidelines issued by the German Electrical and Electronic Manufacturers' Association ZVEI and allow for linking the system to an existing MES system. Our customers benefit from our experience with customer-specific interfaces to Cogiscan (Siemens), Diplan, SAP, ASM and others. We also offer support when our software is being integrated with an existing MES system.

Storage/component monitoring: important storage parameters such as humidity, temperature or operator and assembly orders are logged and available for analysis.

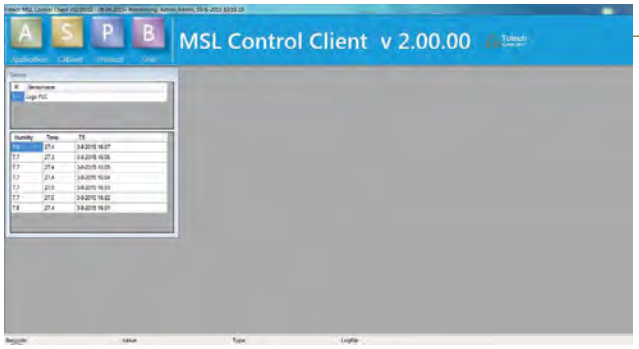
Pick & place function: an integrated pick & place function ensures removal in the order of assembly, just in time and right at the feeder set-up-station. Expiry dates and FIFO principles (including smart FIFO) are observed.

YOUR BENEFITS:

- flawless monitoring and documentation of drying, hold and open times in accordance with JEDEC
- automatic pick & place function for initial set-up and follow-up service
- integration to existing MES systems via customer-specific interface
- unlimited control and traceability throughout the entire logistics chain
- lindividual storage strategies are feasible

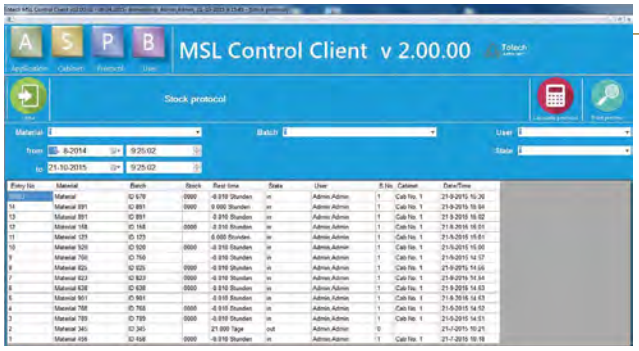
MSL CONTROL CENTER

KEY DATA AVAILABLE AT A GLANCE



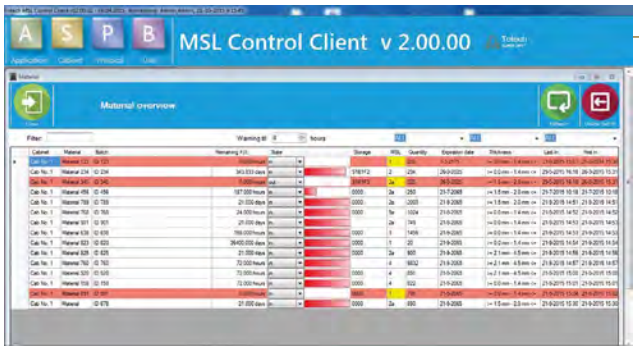
TOWER MONITORING

- online humidity and temperature control
- clearly arranged key process parameters
- alarms are generated as soon as limit values are exceeded
- external storage sites can be integrated



COMPONENT MONITORING

- all stored and removed goods are recorded by time stamp and removal order
- remaining processing time for all components is monitored
- drying process is documented
- stored goods are blocked if the remaining processing time is expired or the expiry date is exceeded



COMPONENT LOGISTICS

- live-tracking-function
- movements within the warehouse are documented
- various statistics functions
- storage logs at the push of a button
- movements within the warehouse are logged
- analysis and evaluation options

AIR-CONDITIONING

PERFECT STORAGE CONDITIONS FOR ELECTRONIC COMPONENTS

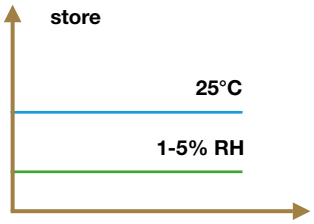
Our series U-7000 drying unit ensures relative humidity values of < 5%.When moisture-sensitive components are stored, the processing time sequence as well as the humidity absorption is stopped. Any possible oxidation of sensitive metal surfaces of components is prevented by electrolyte deprivation. Combined with a 40 °C or 60 °C heater, the entire storage system, or a just a separate area within it, can be tempered. Any expired MSL components are thus gently re-dried.

YOUR BENEFITS:

- continuous component re-drying as per JEDEC standard
- quick re-drying by a minimum relative humidity
- optionally available heater (max. 60 °C) accelerates re-drying
- oxidation processes are prevented

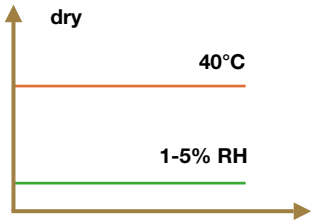
The Dry Tower provides as many as three separate storage areas of different climatic zones. Components are automatically stored and relocated within these three zones in accordance with the remaining processing time.

Examples for climatic conditions:



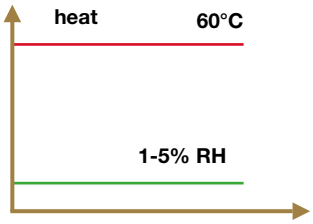
Stopping the moisture absorption and maintaining the remaining processing time.

Corrosion prevention



Slow component drying.

Corrosion prevention



Slow component drying.

Corrosion prevention

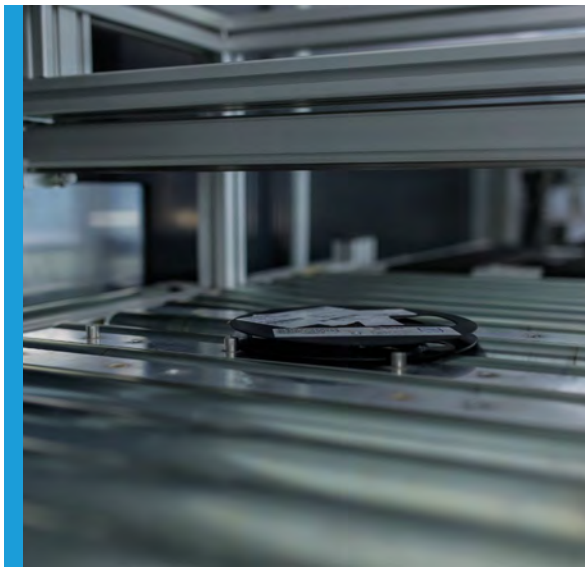
CONVEYING TECHNOLOGY

INDIVIDUAL AND CUSTOMIZED SOLUTIONS

CONVEYOR BELT for quick material handling

PUSHER for direction change (discharge via change)

REMOVAL AT MULTIPLE SITES IS feasible



STOPPER for separation or buffering

JUST-IN-TIME

MINIMUM LEAD TIMES

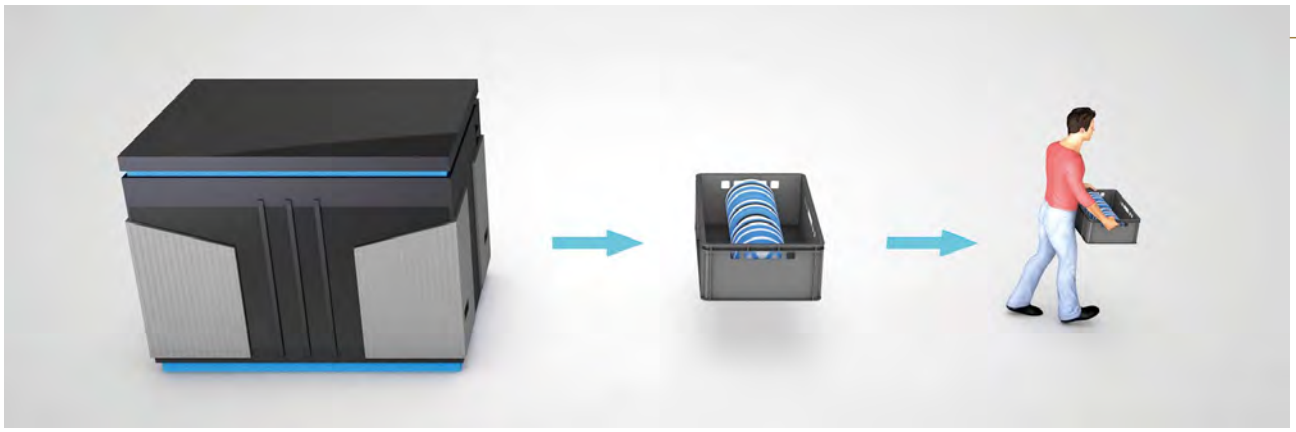
The Dry Tower can be equipped with customized conveying technology for individual packages and/or boxes. Direct follow-up supply of lines is also possible. Centralized, as well as decentralized, removal sites can be realized as customized solutions by deploying roller conveyors, belts, lifts and/or autonomous conveyor systems. This ensures maximum flexibility in component logistics for each and every user.

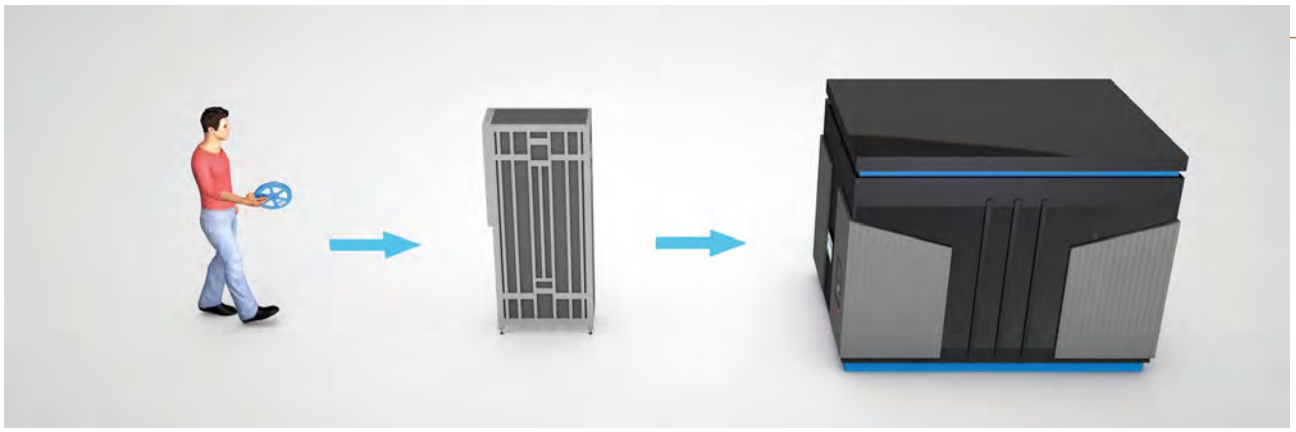
YOUR BENEFITS:

- reduced staff engagement times follow-up
- line supply just-in-time
- separate storing and removal processes
- increased component availability

STORING & REMOVAL

REDUCED STAFF ENGAGEMENT TIMES





BOX LOADING GANTRY FOR REMOVAL

Packages to be removed are sorted upright and in the sequence requested to SLC containers to ensure quick availability and removal.

BENEFITS:

- sorting in the assembly-sequence required
- large-scale follow-up line supply feasible
- easy availability of individual packages
- preliminary pick & place when the capacities allow for it

BOX LOADING GANTRY FOR STORAGE

Unopened or opened packages are stacked in boxes and moved to the Dry Tower where they are stored fully automatically.

BENEFITS:

- separated storage and removal processes
- reduced staff engagement times
- boxes are removed when the capacities allow for it
- continuous supply with packages to be stored

PATERNOSTER FOR STORAGE

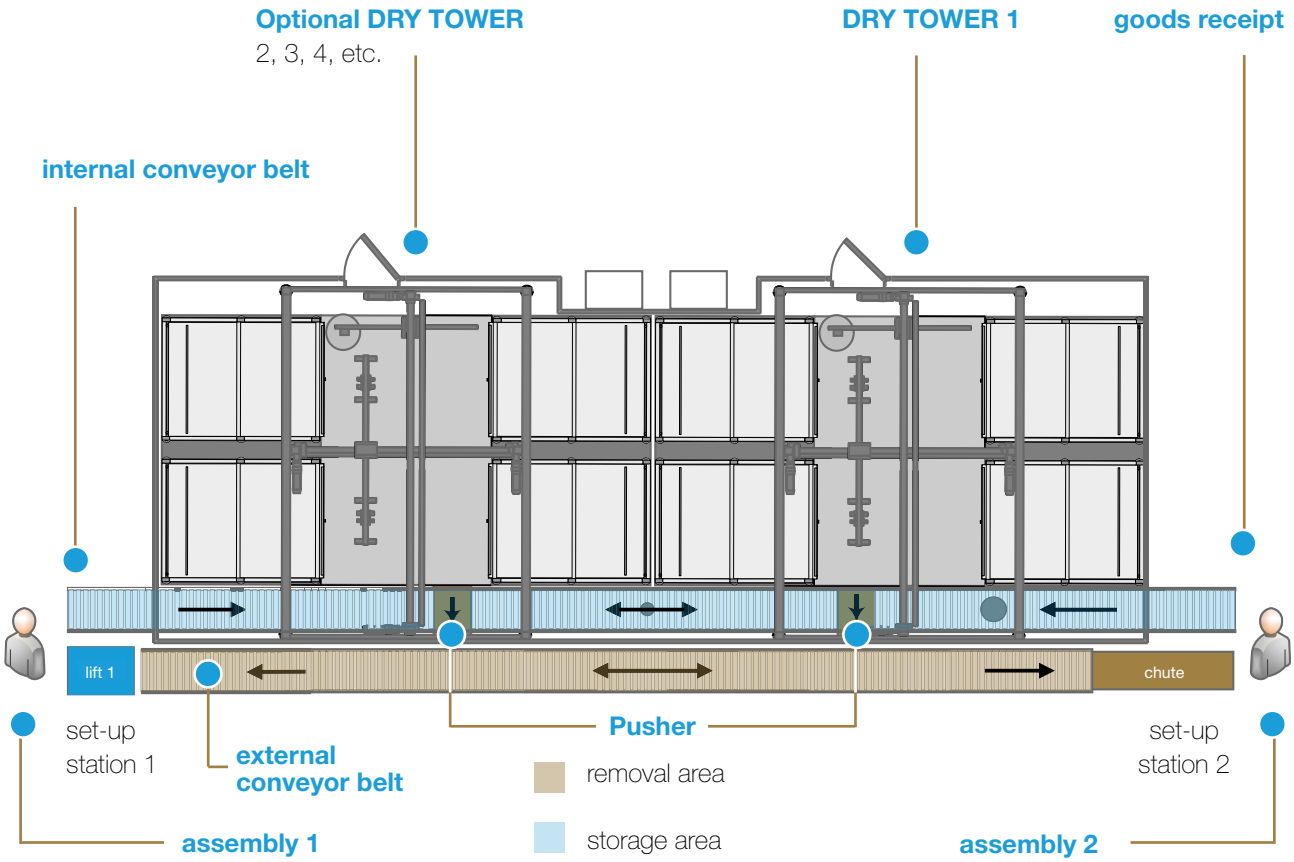
Individual reels are scanned manually and moved to the paternoster, which will accommodate 36 of them and serves as buffer for the Dry Tower. The paternoster is cleared when the capacities allow for it. The Dry Tower is then supplied with the packages.

BENEFITS:

- separated storage and removal processes
- reduced staff engagement times
- paternoster is cleared when the capacities allow for it
- continuous supply with packages to be stored

SAMPLE APPLICATION 1

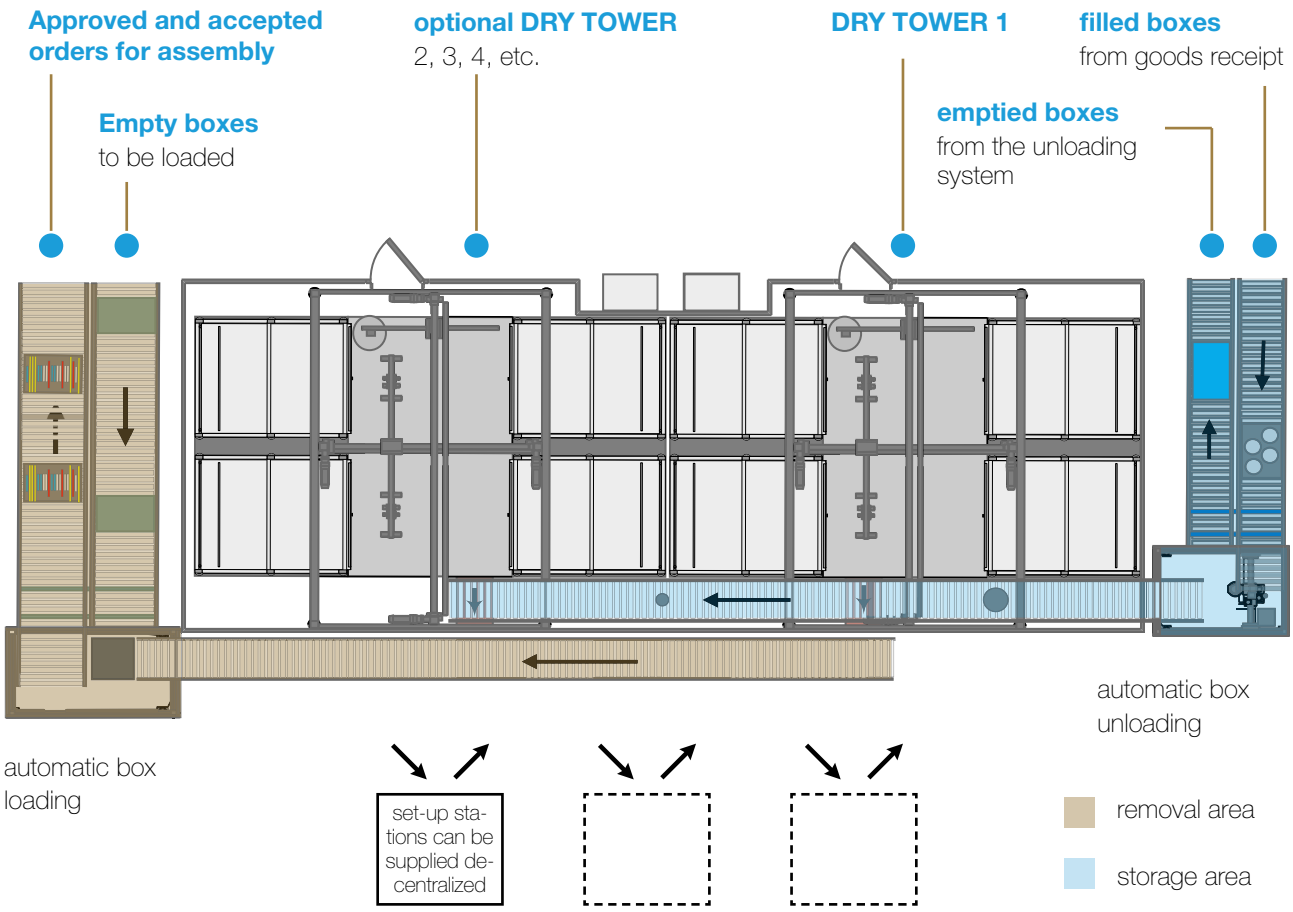
STORAGE FOR OPENED PACKAGES



SITUATION:	POSSIBLE SOLUTIONS:
frequently changing assembly	- various parallel retrieval lines are feasible - quick supply of individual set-up stations - buffering capacities within the conveying line ensure set-up stations are supplied without interruption
large variety of components	- volume consolidation by maximum utilization of the storage space - transparent storage location management
re-storage frequently required	- separate storage and removal - buffering capacities (optionally: paternoster, box removal gantry) facilitate the simultaneous storage of various packages - a high level of automation reduces staff engagement times

SAMPLE APPLICATION 2

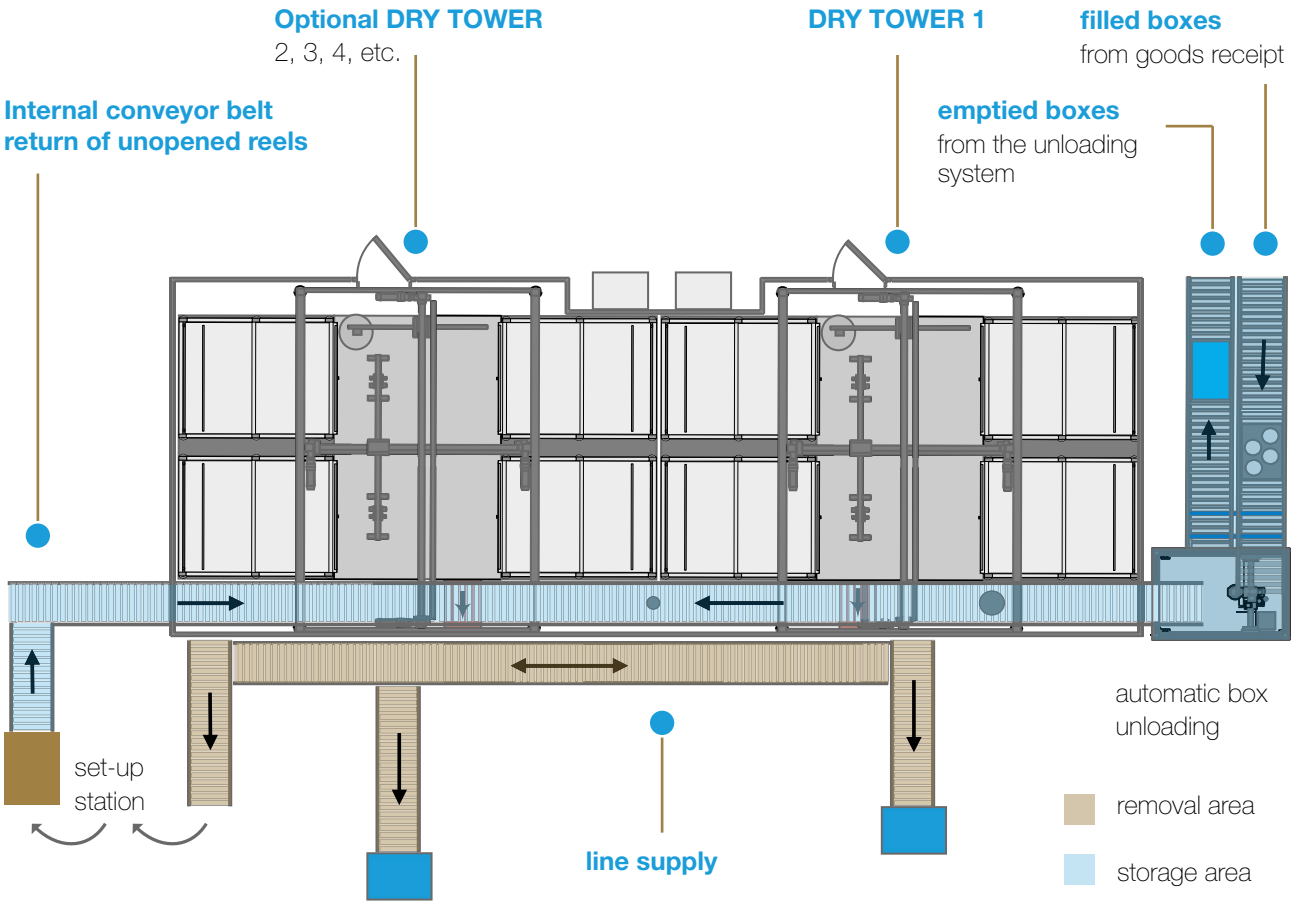
STORAGE CONCEPT WITH BOX LOADING AND UNLOADING GANTRY



SITUATION:	POSSIBLE SOLUTIONS:
large quantities of received goods	- box unloading gantry facilitates the simultaneous storage of various packages - separate storage and removal - interruptions in removal are used for storage activities - manual activities (like scanning and placing packages) can be eliminated
high material requirements in the line	- automatic pre-pick & place in boxes - several packages are transported / returned at once - materials are automatically requested by the MES system
large distances between storage and production line	- minimizing the number of times staff have to go to storage - flexible plant placement - automatic pre-pick & place prevents idle times

SAMPLE APPLICATION 3

STORAGE CONCEPT WITH AUTOMATIC LINE FOLLOW-UP SUPPLY



SITUATION:	POSSIBLE SOLUTIONS:
high material requirements in the line (fixed assembly)	- automatic follow-up supply for individual packages - MES system can request components - quick component transportation - high priority setting for line follow-up supply
large quantities of goods to be re-stored	- box unloading gantry facilitates the simultaneous storage of various packages - separate storage and removal - interruptions in removal are used for storage activities - manual activities (like scanning and placing packages) can be eliminated
partly changing assemblies	- automatic pick & place - specific supply of set-up stations through retrieval lines - re-storage possible right at the set-up station - possible re-storage in SLC containers - high component availability due to quick storage and removal

DEVELOPMENT

OF VARIOUS STORAGE CONCEPTS

Dry Tower's modular structure and flexibility allows for the realization of various storage concepts, which are enhanced through the cooperation with our customers in the project planning phase. In this context, we attach great importance to high cost-efficiency.

PROJECT EXECUTION

PLANNING AND REALIZATION

1. PROJECT PLANNING

- the amounts of material and types of packages to be stored are documented
- dynamic data is evaluated
- the size of the required storage is determined
- project engineers check out the site
- an individual storage concept is created
- hardware-workshop for planning of detailed conveyor technology
- software-workshop for detailed interface planning

2. PROJECT LAUNCH

- site measurement and inspection
- a 3D-constructional drawing is created
- agreements are made with the technical crew assigned by Totech
- the scheduled installation date is defined
- the plant is set up and tested at the factory

3. INSTALLATION, START-UP AND TRAINING

- configuration of customized interface: ca. 7 days
- installation of the plant: ca. 3 days
- installation of individual conveying technology: ca. 1 day
- start-up and test runs: ca. 1 day
- the Dry Tower can now be filled
- detailed training and safety training of operators on site by one of our service engineers

4. PROJECT CLOSURE, SERVICE AND SUPPORT

- 365 days / year, 24/7 service hotline
- Dry Towers are equipped with ISDN/DSL modem to facilitate free remote maintenance services and software updates at any time.
- The customer's staff is trained to service and repair the system. All assembly work related to trouble-shooting are executed by customer's technical staff.

5. WE OFFER A RANGE OF SERVICE CONTRACT TYPES AND OPTIONS WHICH INCLUDE:

- 24 hour online monitoring with technical support desk
- Service Level Agreements to respond to meet your production demands
- Onsite engineering response for maintenance routines and malfunctions
- Spare parts allocation and stocking
- Software upgrades