

storemaster®

Competence in LogisticSystems since 1967

HEAVY WEIGHT-MATERIAL-HANDLING STORE-SYSTEMS

for

sheet metal packages
sheet metal pallets
coils
slit strips
tools
tubes
bars

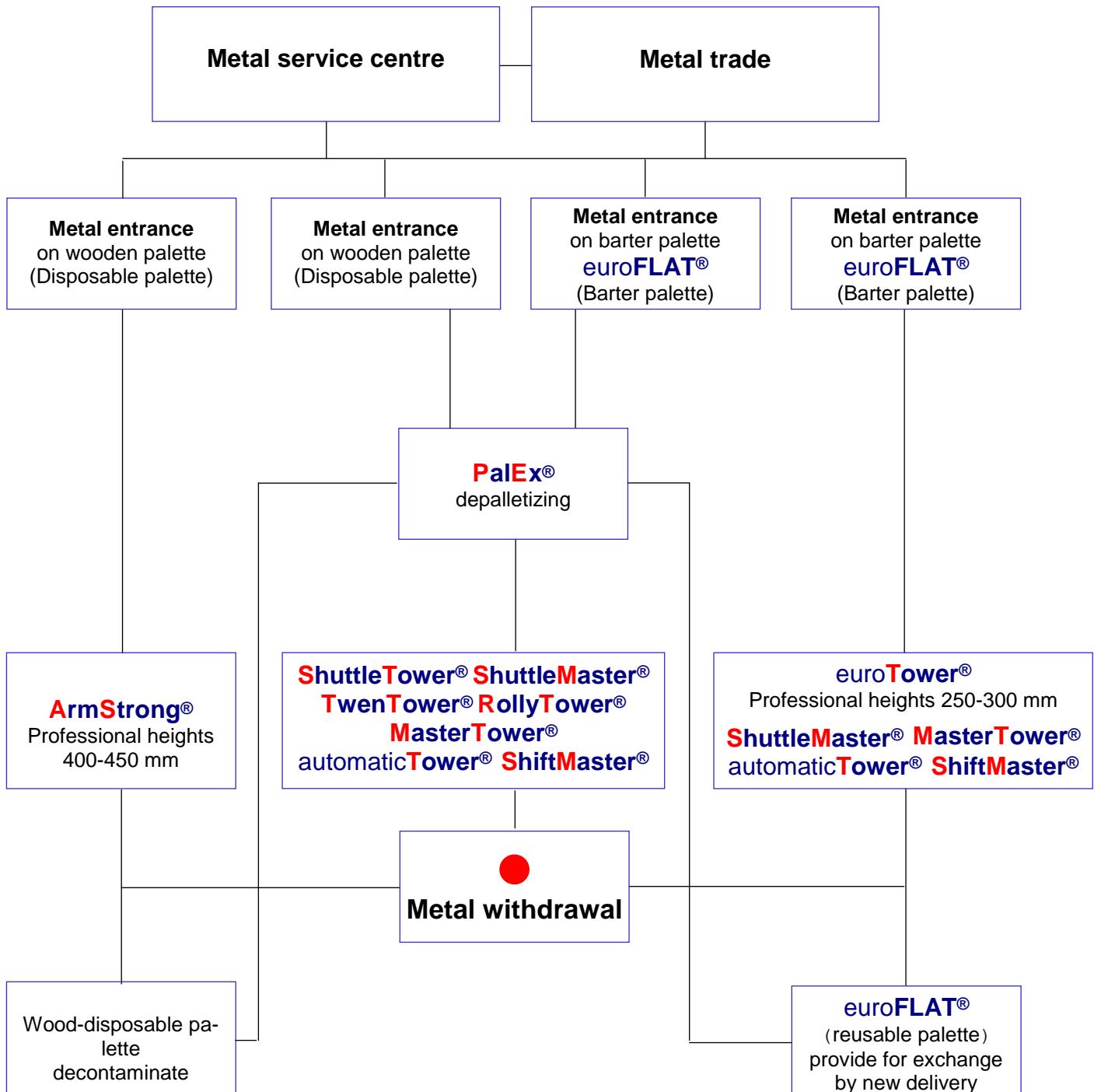
The equipment all around the machine.

Look at all the **storemaster®** videos on **youtube**



Sheet Logistics Concept

Author: Dipl.-Ing. Dieter Paul



storemaster® ► Material in movement

Consulting idea draught planning design project engineering construction production realisation service

sheet metal storage – Drawers – Technology



TwenTower
19 Drawers

MasterTower® TT
with crane and vakuumlifter

e.g. size 3000 x 1500 mm on approx. 2 m access height:

19*/20 drawers for 1.750 kg with 50 mm filling height

15*/16 drawers for 2.500 kg with 75 mm filling height

13* drawers for 3.000 kg with 90 mm filling height

* Side panels as doors

alternatively with removable flats

TwenTower
13 Drawers à 3.000 kg

TwenTower electric
each drawer for max. 10 t



from small format to Gigaformat

From manual up to fully automatic

System allow full electrification / automatable up to 10t shelf load

Master-design with cran-vacuum-technique

Please request special documentation

MasterTower®

Base block TwenTower equipment + accessories

The original

TowerCrane

Complete in 6 m outreach
Max. 400 kg material weight
in the **HandlingMaster** sheet
manipulator

OverheadTop

Storage unit for stacker
operation from the front or
the rear



storemaster®

QUALITY
HITS
PRICE

LoadingBeam
For storage – incl. Various accessories

PaLEX mobil (DBGM 297 11 662.2)
Depalletize – load – stamp out

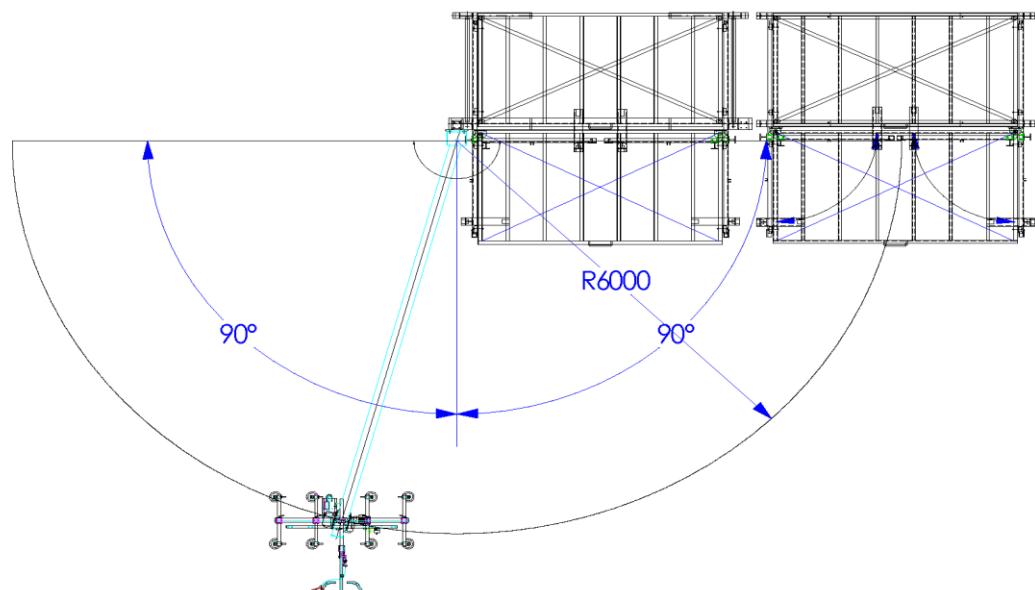
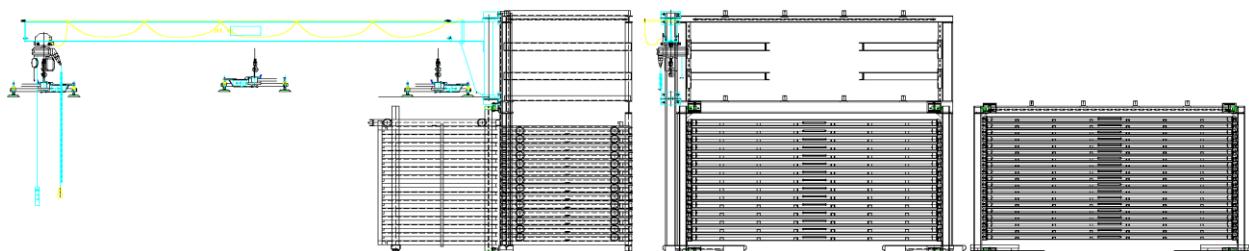
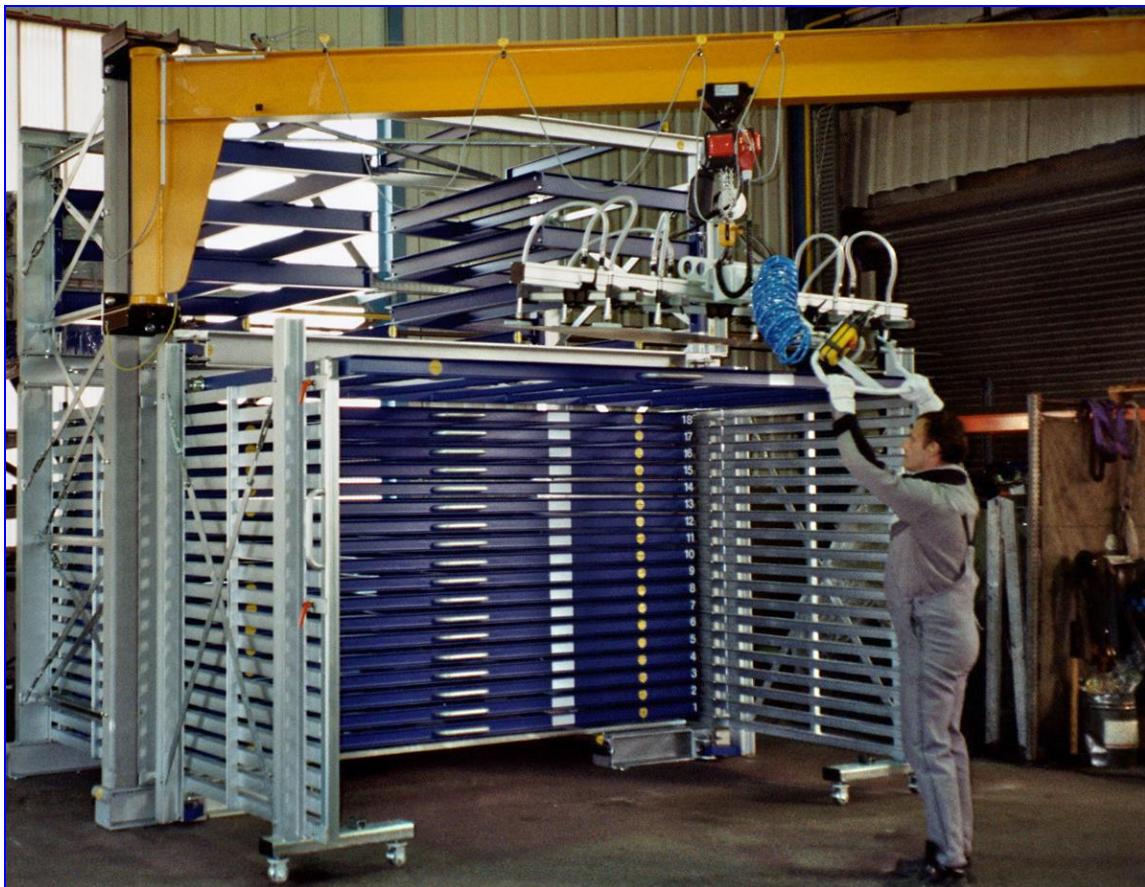


An invention of the **storemaster®** company Germany

MasterTower® TT

Base block TwenTower

19 Large format drawers à 1,75 t load-carrying capacity

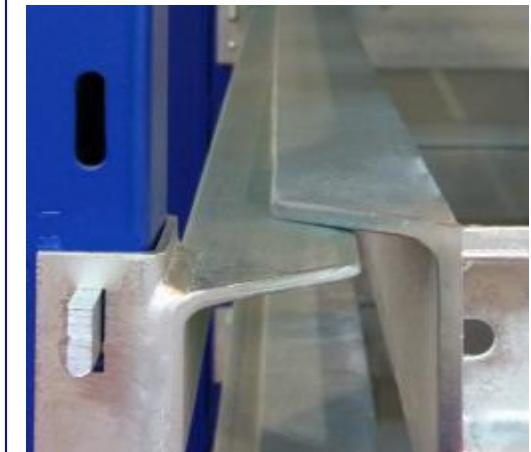


ShuttleTower® Tower stock

Metal packages – System palettes – Technology

Functionality:

- ⇒ 215 mm of storage free heave by forwards extended guide rails
- ⇒ more inalienably unique Handling comfort exclusiv with storemaster®
- ⇒ Angle - to - angle guide while storing + Retract centering bevels
- ⇒ 120 mm of free heave while evacuating
- ⇒ freely of impediment also with sloping situation of stacker and/or system palette
- ⇒ adaptable changeability in 3 axes (professional lengths - professional depths - professional heights)
- ⇒ Insertion guide rails from and hanging-cash around
- ⇒ Professional heights from 150 mm (2 t of large size)
- ⇒ 2 Compartment heights plug grid 75:75 / 62,5:62,5 mm
- ⇒ Stand work increaseable
- ⇒ Shelve on both sides serveable
- ⇒ Ground parking lot for Block stacking of metal package wood palettes within the shelve also with hung up insertion guide rails
- ⇒ Clock out from metal packages for general drawing off from hand
- ⇒ System palettes stackable, suitable for autom. Metal withdrawal as well as 4-prongs forks, Abcoil arrangements and conveyor distances, loadable incl. wooden palette

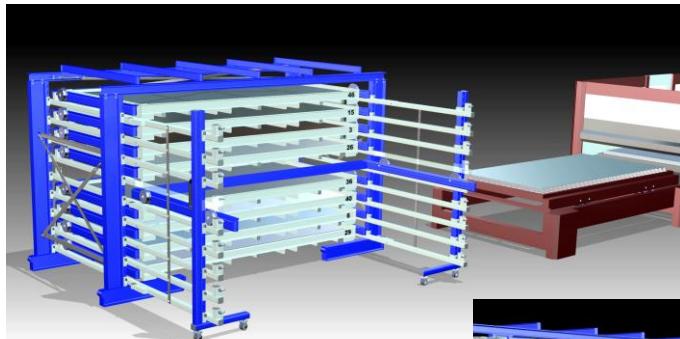


Tower building
technique

Please request special documentation

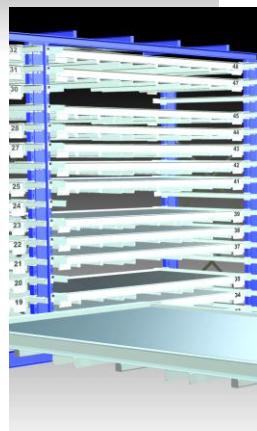
ShuttleMaster (DBGM)

Drawer hybrid system with up to 13 / 19 temporarily in change carriage (DBGM) without wood on up to approx. 2-m extract height inlaid (e.g.) Maxi-Flats à 3.0 / 1.75 t of package weight for the permanent metal place change with manual or electrified extract. Flash loading of the Flats by means of **PaLEX®** (DBGM).

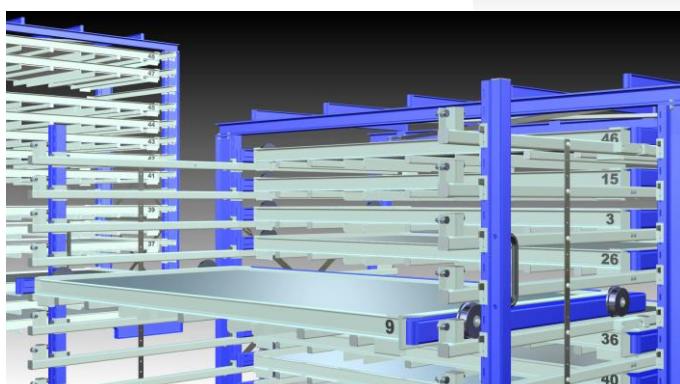


Change carriage loading
with new metal kind

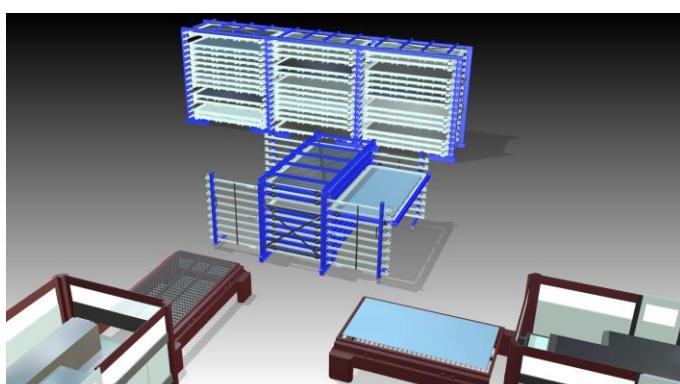
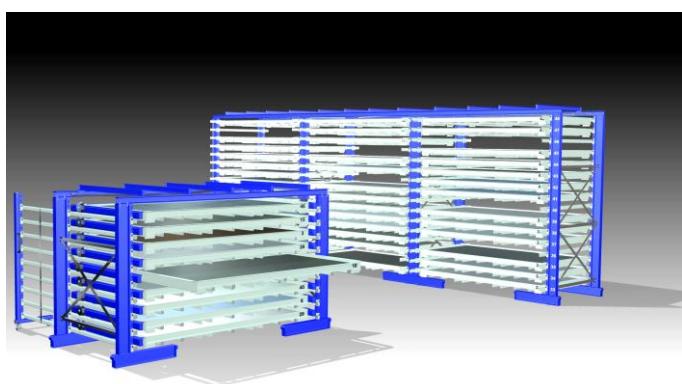
After processing of a metal kind the Flat withdrawal from the system occurred to the return in **OverheadTop** or the **ShuttleTower®** arrangement. The arrested change carriage is positioned so to the admission of a new Flats with a new metal kind.



For the drawer function in the change carriage stored Flat.



Back-sided Flat insertion
without extract-rolling cheeks.



Extract-rolling cheeks front-sided and back-sided for double-sided metal withdrawal

MasterTower®SM

ShuttleMaster + OverheadTop + Crane vacuum technology

... an invention of the **storemaster®-Company Germany**



sheet metal handling system with changing cassettes:

ShuttleMaster
+
OverheadTop
+
TowerCrane
+
HandlingMaster

Extraction of a system pallet

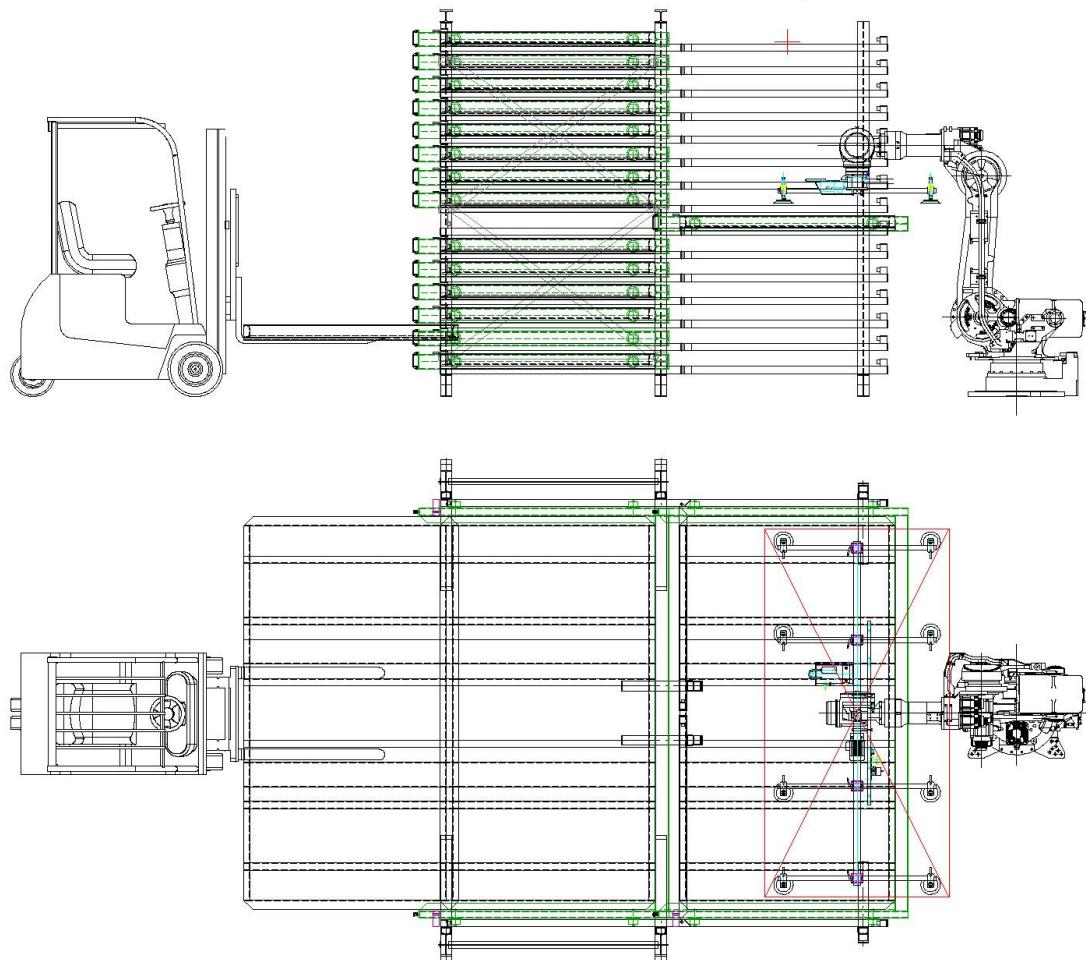
from the rear side of the

MasterTower®SM OverheadTop



occupancy
of a changing wagon of the
ShuttleMaster
with a system-pallet (cassette)
from the rear side

ShuttleMaster (DBG) World novelty Automatic Tower



System of the fully automatic metal supply in singles or double tower implementation with 15/30 (stacker's companies) optionally 20/40 (robot loadings) to the extracts from which a sheet manipulator machine-steered over professional coach (robot) helps itself.

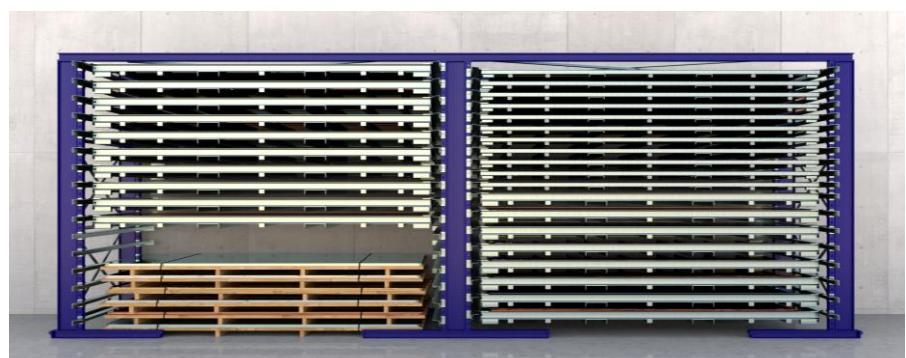
With more, or later coming metal kinds (only possibly with forklift - change pallet operation) a buffer camp from pile-work of the system ShuttleTower with arbitrarily many camp units is provided to the system. From these a forklift helps itself to make available the metal requested by the machine to the robot by back-sided insertion in the system AutomaticTower on time. This can happen according to mode of operation sporadically, phase-wise or constantly. The residence of the metal kinds in the system AutomaticTower is certainly by the job list of the machine. Camp management as well as double tin recognition and double separation are integrated. The tact time for the access lies with less than one minute. By system disturbance all metal kinds remain furthermore in unchecked access.

Cut metal boards are taken by optionally application of a surface suction grip arm by the robot in the AutomaticTower tower extracts restacked and for the subsequent treatment of the stacker back-sided, or are filed with robot loading by this on a handing over place.

The construction height of the AutomaticTower ends with 4.5 metres. The interpretation of the robot is depending on the at most metal weight; this may not cross 600 kg.

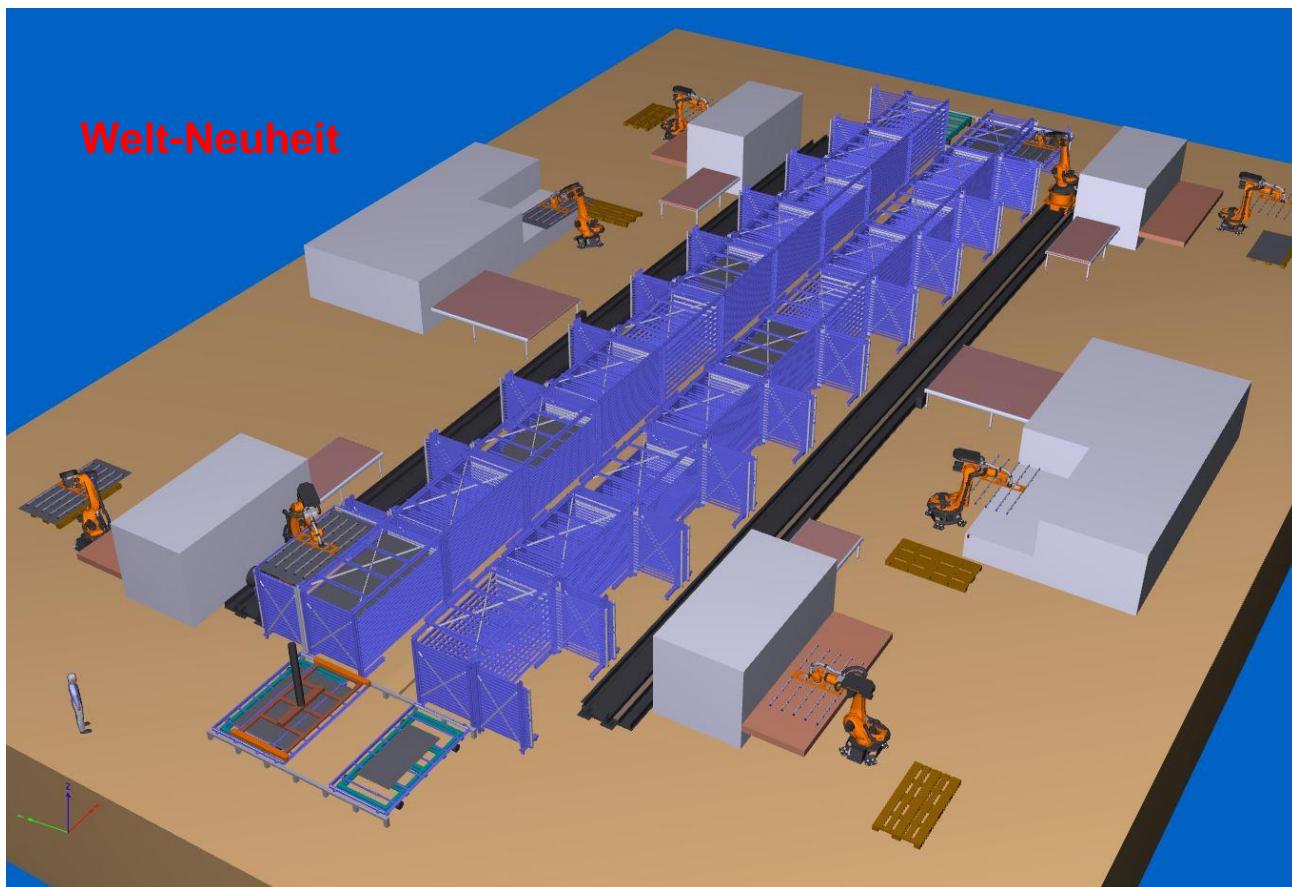
ShuttleTower

Mounting system with plug-in variable shelf heights for an arbitrary number of sheet metal grades, and sufficient storage space for not yet registered, palletized new entries.



storemaster®24 smart factory 4.0

sheet metal storage- fully automatic system



Welt-Neuheit

Pull Pick & Place

fully automatically the metal to the machine (the **metal package** remains in the shelfe)... **in 1 - minute tact**
with up to 1,000 metal kinds spontaneously and constantly available for up to 10 machines

PPP metal board and metal parts distribution and board / assembly Kommissionier camp

if the production efficiency increases on huge 100% by

50% saved capital costs

50% of lower energy costs

50% shorter access times

50% less space height

(in comparison to customary vollautom. High-level shelve-Lägern - capacity and surface need identically)

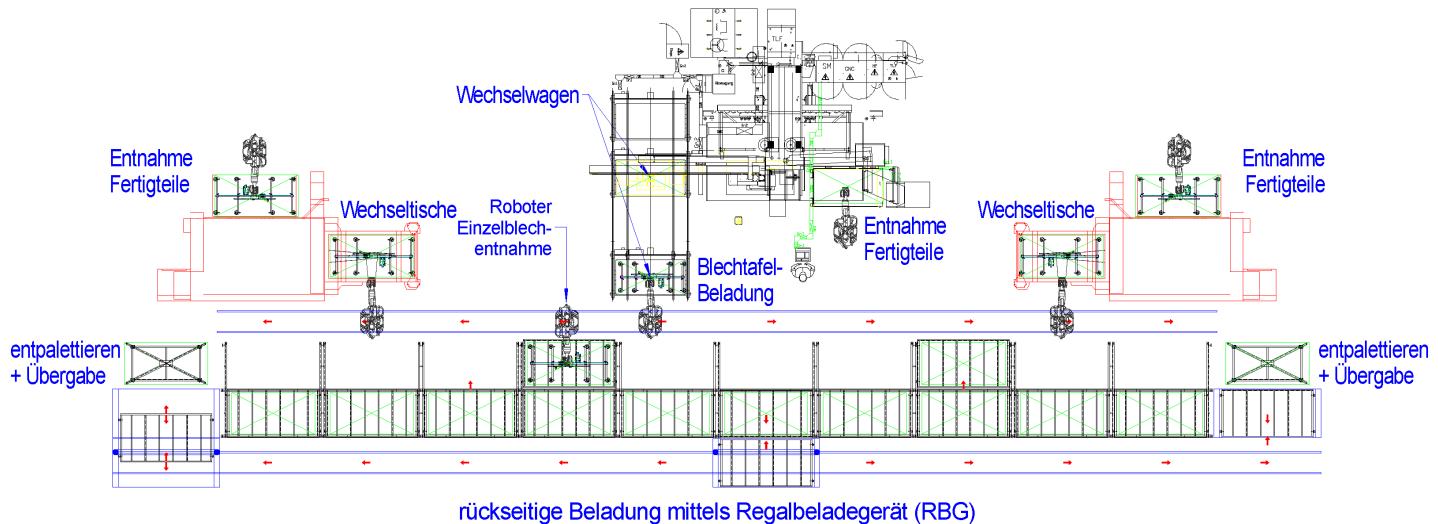
storemaster® - Innovation (DBGM) ... promoted from...



www.storemaster.de sheet metal storage camp automatic / videos

storemaster®24 smart factory 4.0

fully automatic sheet metal storage



storemaster® Pioneers of the warehouse technology



ShiftMaster DBGM

Fully automatic distribution and picking centre for boards and components

Expiry descriptions

Metal board distribution

Metal package storage

Stacker / RBG (government nightmare battery charger) takes Arrangements-back-sided from him signalled empty load bearer for the purpose of loading in the PalEx station after bar code scan comparison and brings back him loaded to the source field. System registers new stock.

Single tin withdrawal

Machine job buffer receives work order by manual input in the machine od. directly from the OBV. under possible specification of priority and part manufacturing

Material requirement of the machine for the camp management

Camp management (with Mindest-Bestands-Bestell-Automatik and permanent stocktaking announcement) transmits shelf and aim machine in robot

With stock > 0 robot processes buffered orders need-optimised and road-optimised od. after priority default (machine signals > machine freely <... opt. robot knows job time)

(**every** metal kind is available to **every** machine precisely in time **constantly**)

Robot positions angeflanschte VakuumTraverse before concerning drawer and shuts

Cotaker of the VakuumTraverse in drawer admission one

Robot takes off drawer till metal withdrawal-position by means of VakuumTraverse

System stores > drawer taken off <

Robot releases itself and takes metal by means of VakuumTraverse after double metal

Check (adhesion) and perhaps of necessary double tin separation

Robot goes to the machine and files metal on machine handing over place-authoritative point taken off drawer becomes first before extract of a drawer required under it again

pushed back in starting position, so that they for an interneed at the possession

stands, without it needs to be taken off for it again

Metal parts-picking

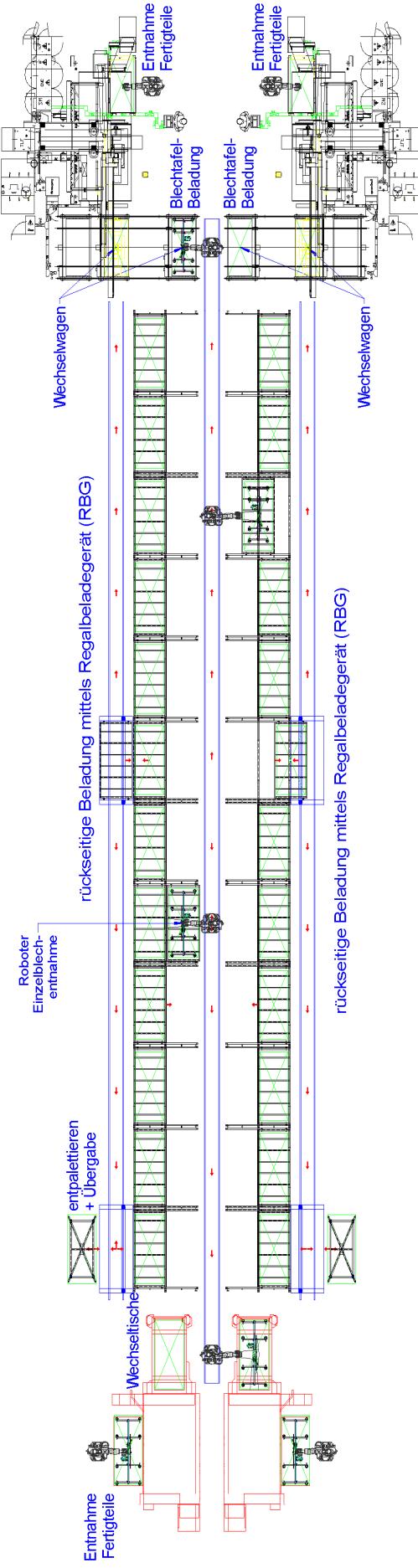
From the machine for the dispatch:

on from the OBV. intended **euroTablar**® barter palette to assortierten parts are provided in the

ArmStrong® dispatch camp for the truck evacuation.

From the machine in **PullPick&Place** –picking warehouse:

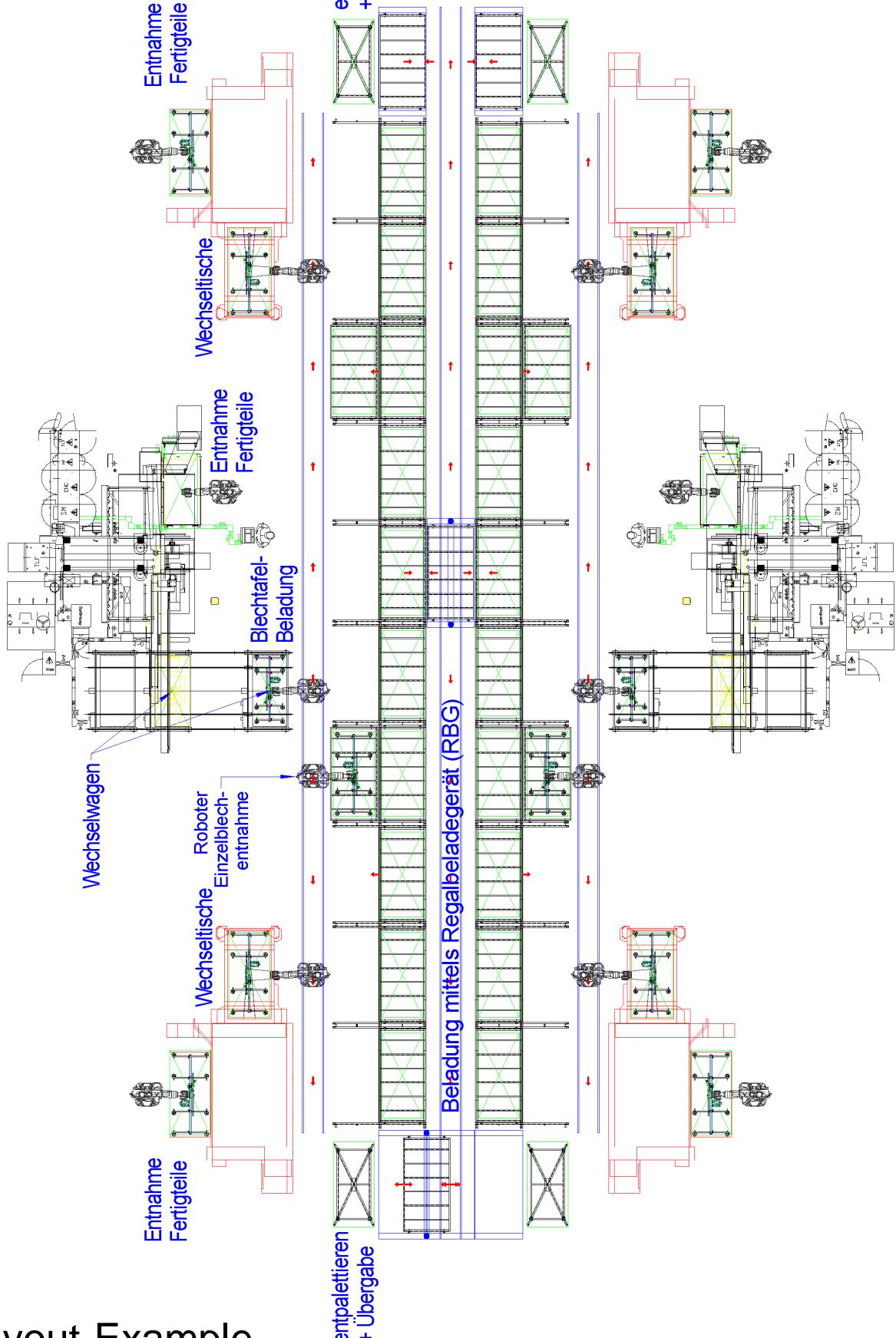
from the OBV. to intended, on the **PPP**-Lager-Flat to assortierten parts are provided in the **PPP**-Kom-missionier-Lager and from the robot from the drawers on a carried along Baugruppen-Flat kommissioniert; these Flats go to another manufacturing-integrated buffer camp **PPP** within the assembly Herstellungs area.



Layout-Example

ShiftMaster

DBGM

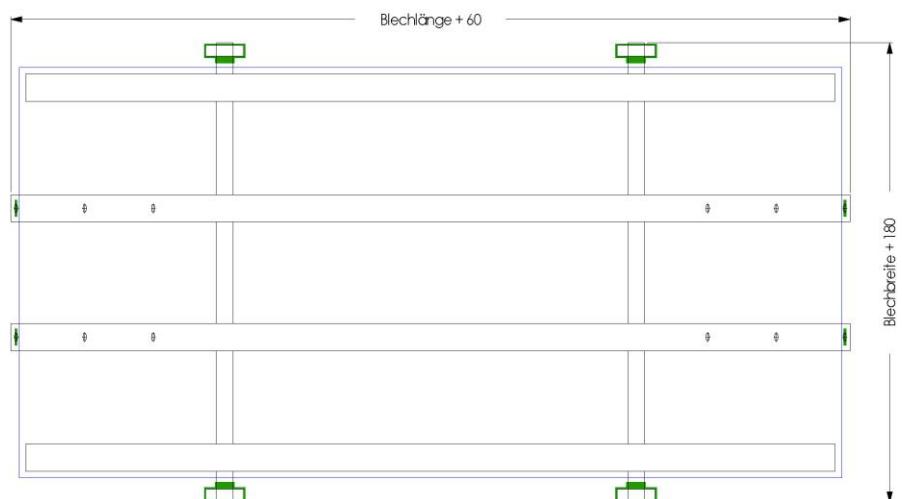
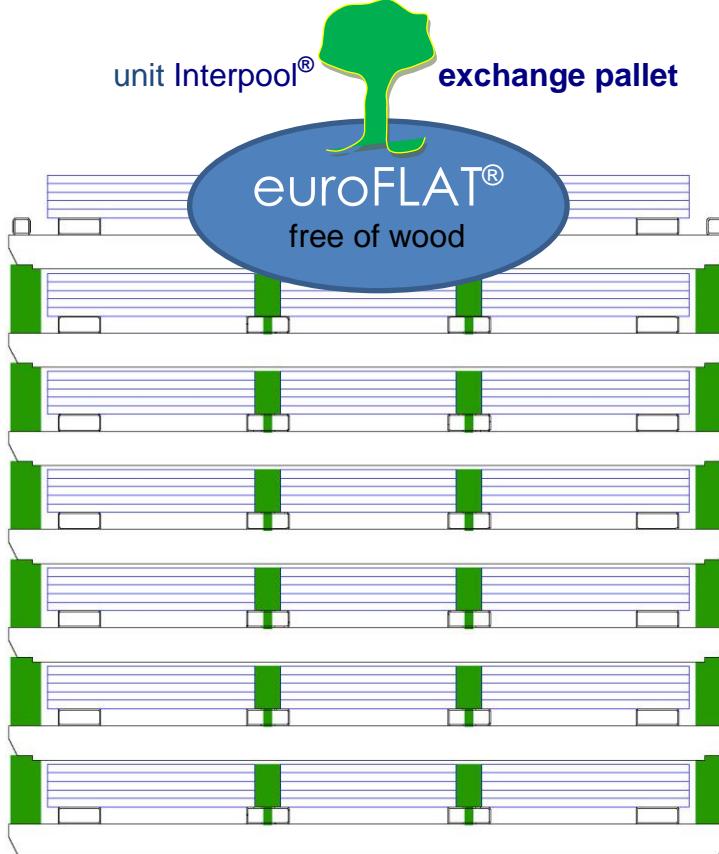


Layout-Example

unit Interpool® exchange pallet

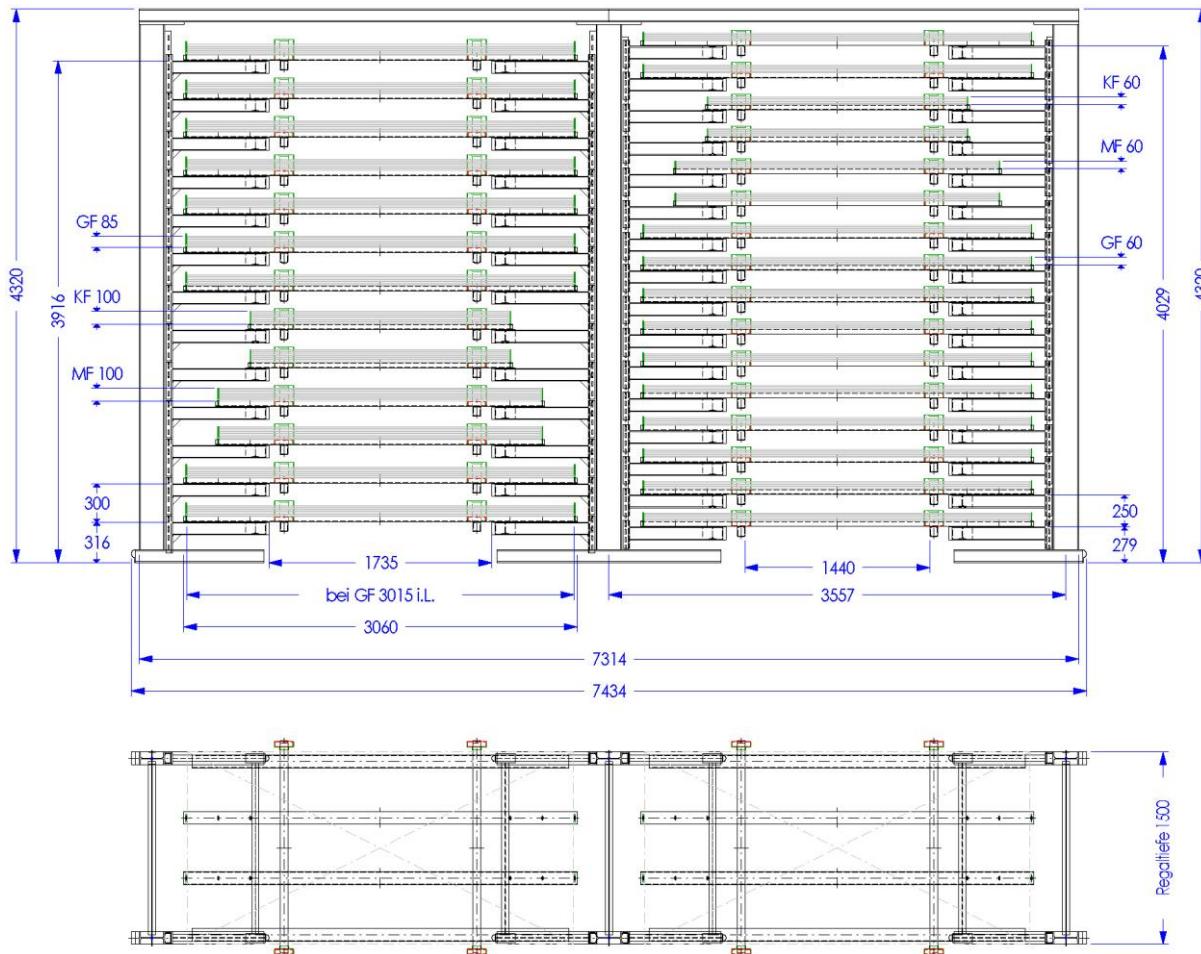
euroFLAT®

free of wood



euroFLAT® Interpool® exchangepallet

THE FUTURE OF SHEET METAL STORE AND WORKING



The unit standard:

Permissible load for flats and shelves format-independent 3.000 kg

Frame depth = depth of metal sheet

Tower width: sheet length + 500 mm

Height adjustment pluggable: 62,5 or 75 mm

Package height up 60 mm ⇒ level distance 250 mm

Package height up 100 / 120 mm ⇒ level distance 300 / 312,5 mm

miscible:

all formats of pallets and packages

Occupancy:

by forklift front or rear side

Capacity:

stacker max. folk height ... divided by ... level distance

Executable as
MasterTower®

With integrated crane vacuum
sheet removal technology

Please request special documentation

All around the machine

1. Carriage for remaining sheet metal

... an invention of the **storemaster®** company Germany

...the small sheet metal storage...



movable by hand
pluggable push handles
on both front ends



for
transportation
by stacker



for take-up
with crane

remaining metal
sheets in full length of
3 or 4 m
without lateral over-
lap, gentle on the ma-
terial and accident
preventive

optionally with trailer
coupling for stacker

For the arrangement
in line
with lateral guidance

sheet panels / residual sheets short lengths / pre-cuts

dimensions 3.300 / 4.300 x 1250 mm

with 64/80 dividers 750 mm high

in V-shape for clear browsing
from the longitudinal side

pluggable from 50:50 mm for widths of 40

+ n x 50 mm, movable by hand

steering wheels with locking devices,

payload 2 t, to use with forklift and

integrable into **ShuttleTower®**

(fits in a **ShuttleTower®** - system field)

fast, comfortable
and anatomical
access due to
conical bails

for a sorted
management
of sheet metal

2. Metal parts- Dispatch board-wise (sort is cancelled)



Interpool® Unity exchange palette

Part management on ● - Smart industry 4.0

for production, assembly assembly, Kommissionierung, truck dispatch, camp technology

⇒ **unsorted laser part-direct dispatch kompl. Cut boards without part sort**

(Absortierung of cut metal parts is cancelled - perhaps Deburr anxiously the customer)
as well as suitably for metal packages and absortierte laser individual parts - stackable, hot-dip
galvanised

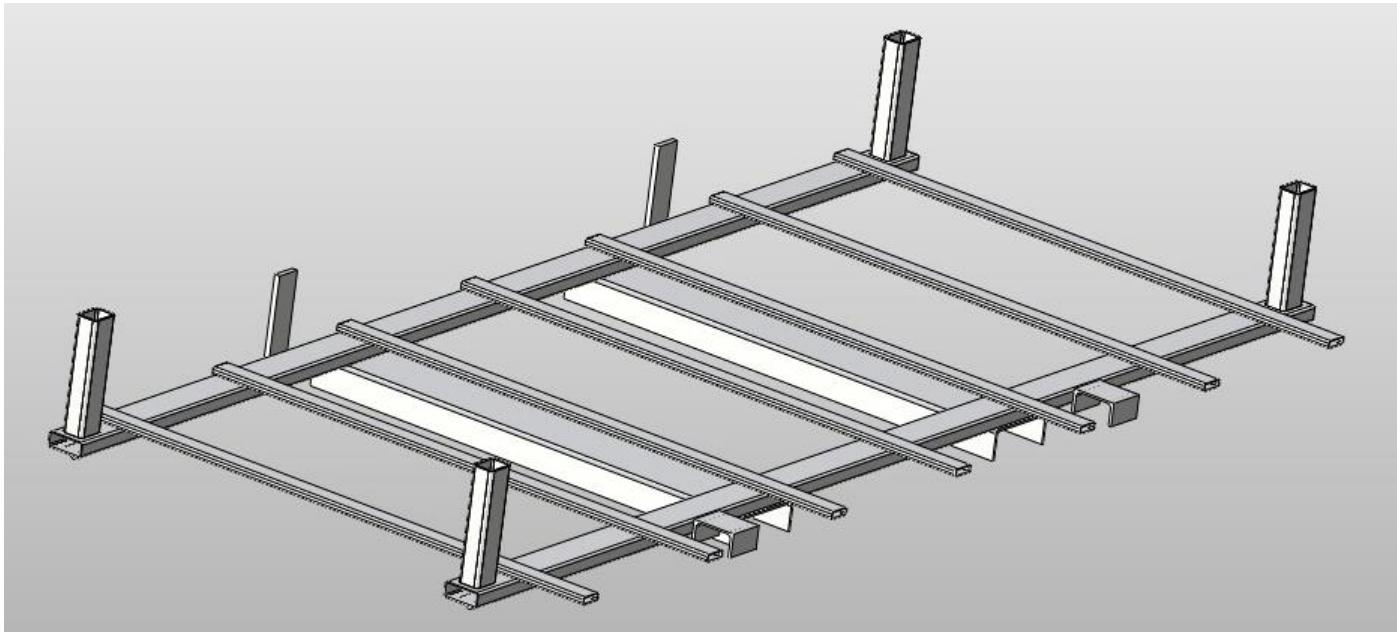
Load-carrying capacity 3 t - in the pile 30 t - available in dimensions Small, means, Largely and
Maxiformat

3. Transport carriages for europalette



4. The Rest grid Flat

disposal into the scrap metal container
for all sheet metal formats, stackable, hot dip galvanized



Handling:

1. Load the pallet with residual grids
2. Transport the pallet to the scrap container by forklift
3. Place the U-shaped pallets on the container edge
4. Extend the fork fork to about 1/3 of the pallet depth from the stacker shoes
5. Lift the pallet on one side by lifting the truck until the remaining grid slides into the container
6. Lower the forklift fork until the pallet is horizontal
7. Fully retract the forklift fork into the pallet lugs of the pallet
8. Lift the pallet from the container edge
9. Return of the pallet to the machine

5. Flexibolo[©]

The system palettes-transport carriage



turns right away

One-format variation handlebar stationary
More format variation handlebar telescopically

6. The metal departing from the pile **generally** from hand



by means of
PalEx[®]
Patent-Ausstempler

in the machine

DBGM

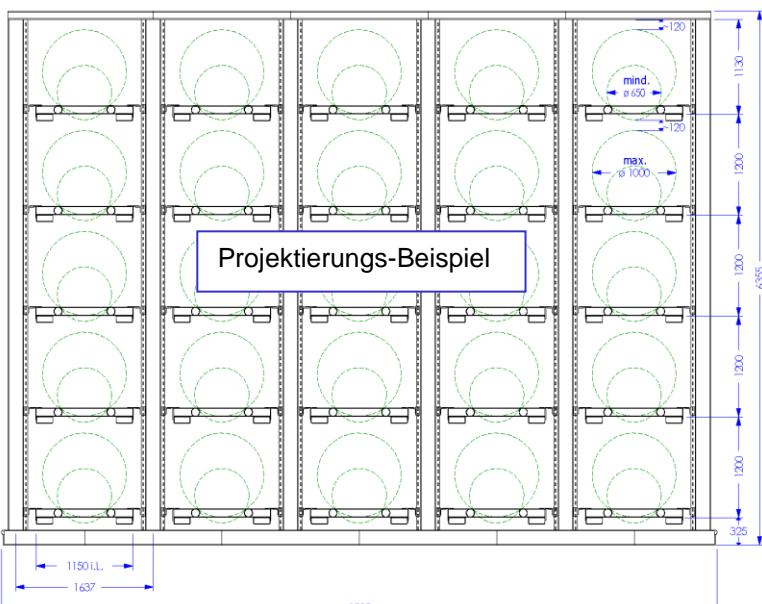
CoilStore^{© ST}



Coilflats feuerverzinkt - Leerflats stapelbar - für den Außenbetrieb geeignet

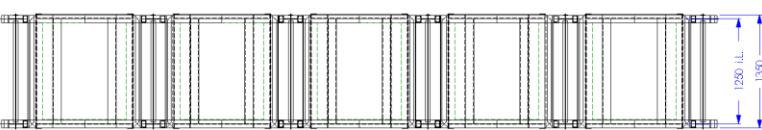
Coil-Außen-Durchmesser (mm) – Innen-Durchmesser 508 mm

Coil-Gewicht (kg)	Bandbreite (mm)			
	1000	1250	1500	2000
2500	815	763	727	679
5000	1034	952	894	815
7500	1214	1110	1034	931
10000	1371	1247	1157	1034
12500	1512	1371	1269	1128
15000	1640	1485	1371	1214

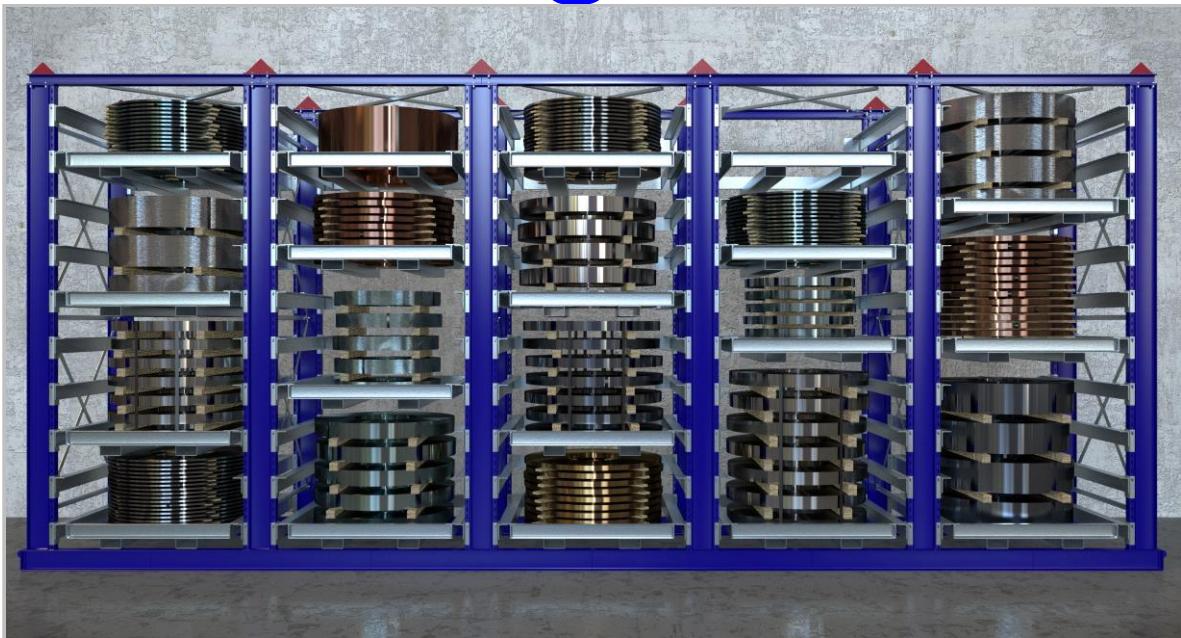


The **CoilStore^{© ST}** is a heavy handling storage system serveable by stacker's fork of the type **shuttleTower[®]** with which the stacker hands over the Coil without thorn directly to the windlass of the Abcoil arrangement. According to windlass implementation or handing over station the Coilflat is adapted in his creation this. After the process of the phase out the takeover of the Coils occurs in reverse manner through the forklift flat for the back transport in the **CoilStore[®]**. Speedy storing and evacuating is guaranteed by the **storemaster[®]** typical Angle - to - angle guide. The flexibility by the professional heights-plug grid of 75:75 mm allows an optimum adaptation to the professional height need steadily changing in the manufacturing course, in particular by the putting of fictive empty fields by means of more additional Immersion seemed in the 300-mm distance.

Distortions by ellipse education (ground storage) and oval education (thorn admission) are excluded.



SlittingStore^{©ST}



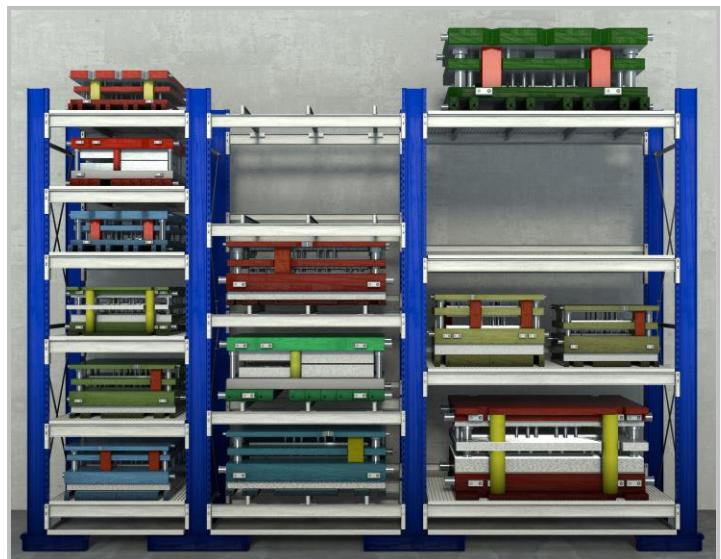
The **SlittingStoreST** is a Schwerlast-Handling-Lager-System serveable by stackers of the type **ShuttleTower[®]**. The Flats take up loads up to 10 t (tower load max. 150 t) and are inserted especially in order to save space in camp towers which permit a continuous height adaptation to the just present loading height of the transport unity what buffer capacity for new entries originates from. This is allowed by the rail crowd prepared for the insertion in varying distances built-in and from 62.5 / 75 mm height adjustable Suspended load bearing guideways with Komfort-Einfahrhilfen. Moreover, the efficiency of the saving space consists in the fact that have an influence neither on wooden palette nor on shelve bearer and special stacker's excavation the necessary professional height need unfavorably. The Entpalettieren or loading the Flats occurs by means of record hook or stacker; in the ideal case the Flats serve in the shuttle company as a barter palette. Stand work and Flats will provide with magnetic numbering. With missing EDP (ERP/PPS) a suitable camp management programme can be used for static (fairground) or dynamic (chaotic) place order, ggfs. in connection with stacker's scales for the care of a permanent stocktaking. A Bar code camera-controlled recognition system is soon available for the chaotic variation. The hot-dip galvanised Flats are produced resistant to push of warm-rolled full steel profiles. The construction is increaseable and can find completely hot-dip galvanised also in the undeveloped outskirt area with construction-sided roof lines and wall disguising use. For an advantageous load distribution, also with unfavorable ground relations, provide continuous ground bearers. Also here is valid, how for all **storemaster[®]**

- Systems, for statics, construction, functionality, quality of the processing, steadfastness in the long-term application and with it optimum economic efficiency:

100 % made in Germany!

ToolStore[©]

Treacly load tool camp to 8 t of professional load 150 t of field load, suspended beam-shelve system with grating-professional covers or Hangup deep webs as well as Durchschub protections and oil-rallying tubs - professional heights-plus and 75:75 mm ⇒ ⇒ ⇒ ⇒ ⇒

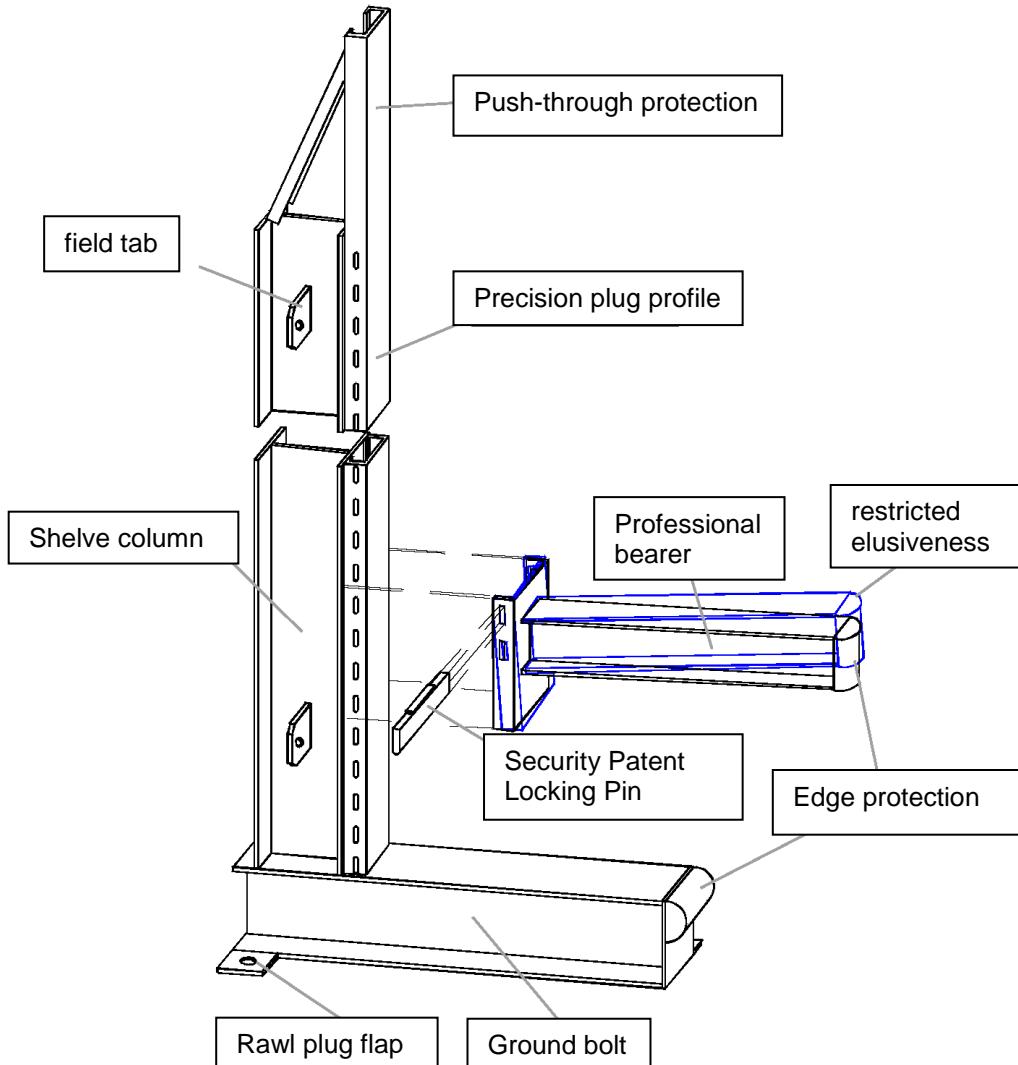


ArmStrong®

An invention of the **storemaster®** company Germany

The cantilever – Safety first

1000-fold provenly - the ex-serviceman...
... with it our fathers already camped down. . .



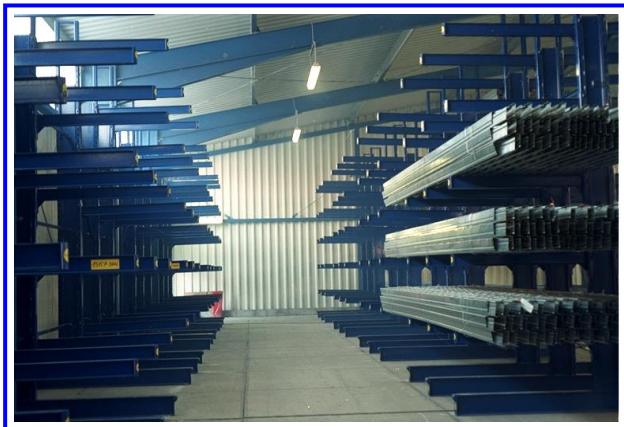
ArmStrong® Cantilever boltless shelvings have strong arms:
an arm 3,000 kg carries on 1000-mm length
an arm 2,500 kg carries on 1250-mm length
an arm 2,000 kg carries on 1500-mm length
an arm 1,500 kg carries on 2000-mm length
an arm 1,250 kg carries on 2500-mm length

ArmStrong® Cantilever boltless shelvings

- plug arms have for variable professional heights in the 75 mm of grid
- are equipped when required with footbridges and gratings
- in the undeveloped outskirt area hot-dip galvanised with roof and wall

ArmStrong®

An invention of the **storemaster®** company Germany



for every need - freely configurable



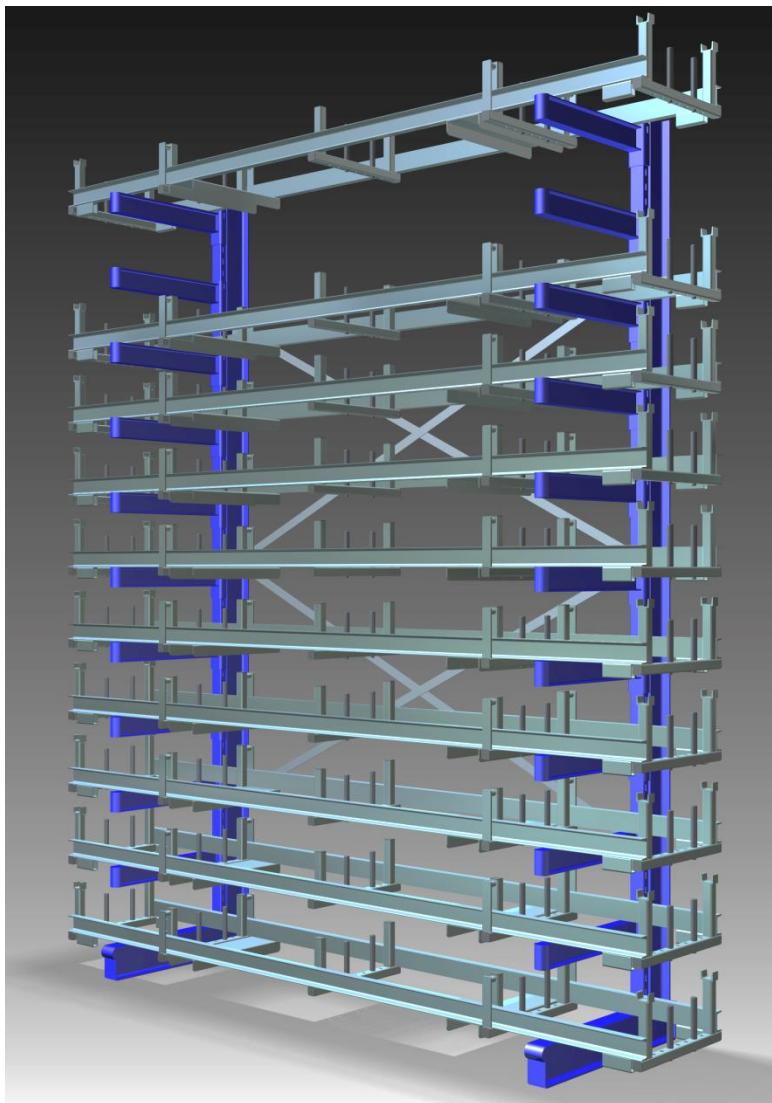
ArmStrong® BlechNorm



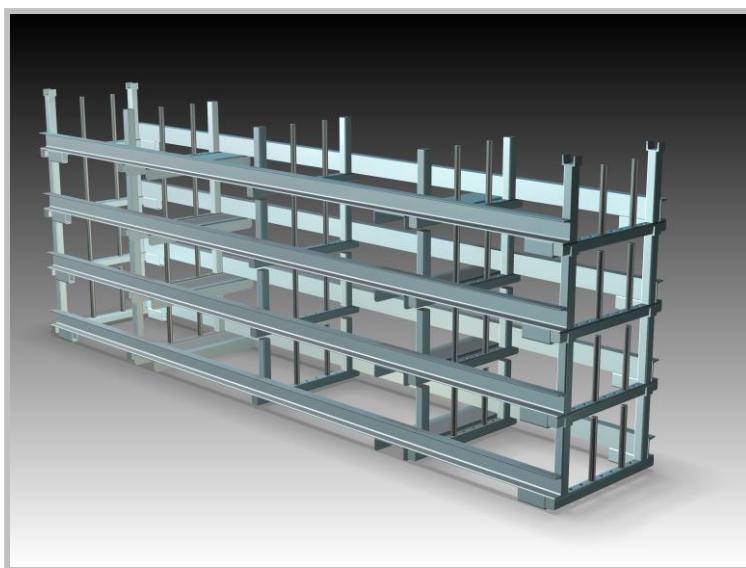
for 35 years of **ArmStrong®** - cantilever shelves in the metal industry

ArmStrong®plus

Long property-Shuttle-Palettes-storage system



**Long good palettes-plug shelf system for 3 - 12 m of long property
Load bearer stackable - for crane and forklift**



TopTechnology by **storemaster® innovations**

ArmStrong® - Vertical-Series

An invention of the storemaster® company Germany

Stick material-plug shelf for the crane service
a clever contribution to progressive camp technology

Technical Data

Stand distances: 750 + nx250 to 2000 mm

Benefit depths: 500 - 600 - 700 - 800 mm

allowed cantilever rack load: 350 to 1000 kg
(gl.v. L.)

Stand-whole heights incl. horiz. Head level:
In 2340 +nx300 to 3240 mm

Professional heights-adjustability: in the 75 mm
plug grid

Accessories:

a) Storage facilities, puttable

b) picking aids, puttable

dimensioning

Foot beams: Massive steel 160 mm

Columns: unilaterally 210 mm, on both sides 260 mm

Kragarme: Rectangle pipe 80 x 60 mm

Spraying: RAL 5002 extremist marine blue

System sign:

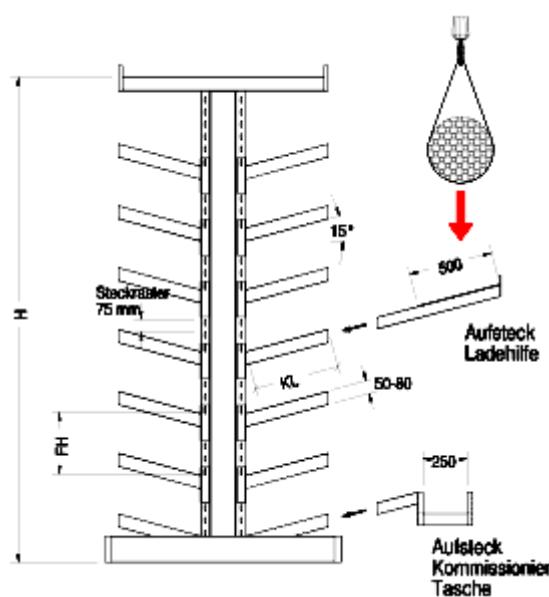
The cantilevers are mountable by means of
horizontal ones

pre- performing to the columns and therefore with
more any Professional height without impediment by
being higher ones Camp levels height adjustable, as
well as around and post one
preparable; i.e.

**by any professional height change none becomes
Dismantling of being higher cantilever rack level
necessarily**

Shelf stand unilaterally or on both sides

(Representation on both sides)



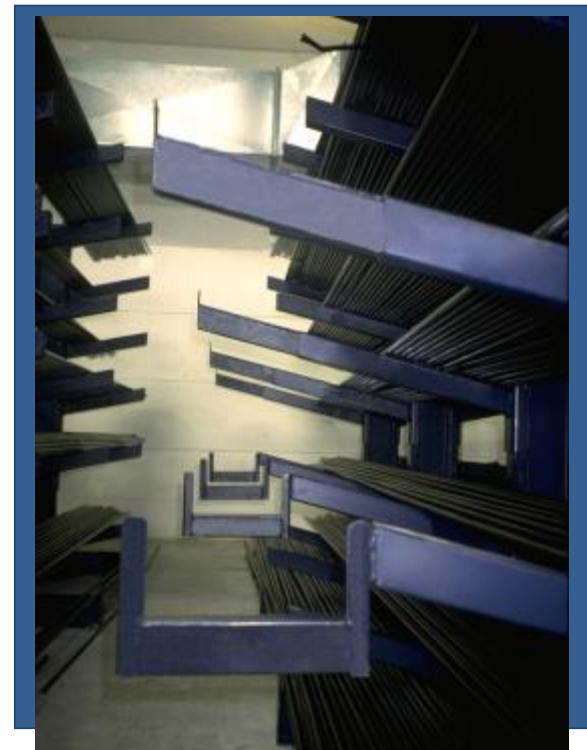
Functionality

A

With the shelfe filling this is set down in the way area in the
crane sinking alliance on the storage facilities which were
pocketed for this purpose before in the cantilevers worked
from strong rectangle pipe in the fine way after which the load
on account of the sloping position of the Kragarme (gradient
15 °) with further slowly giving way crane hook bit by bit slides
into the shelf.

B

To the material withdrawal U-shaped storemaster®-
Großraum-picking aids are put on in Handlinghöhe on the
Kragarme. Now from all floors stick can be filed by hand for
stick in the pockets to the commission is entire. Now admission
on by belt from the pockets and the wide transport of the whole
pocket contents in the processing zones or with trading
venture to the position ready for sending are taken over only
from the crane.



ArmStrong® swingout® DBGM

(the invention: Swivel instead of cranks)

Long property plug shelf system of the crane service

... An invention of the **storemaster®** company Germany



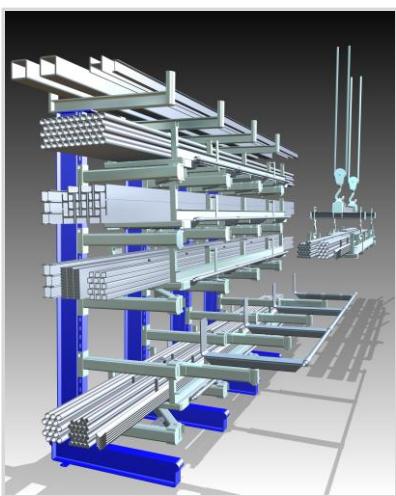
The patent



Functionality + flexibility



The loading



Application of long good cassettes



Precision + quality = durability

**Camp levels in seconds swillable out
with the slightest effort without additional service facilities - to 5 t of professional load electrifies**

Handling along od. forehead-sided single sticks od. whole stick, profile od. Pipe bundles, from waves, rollers, axes, masts, boxes, metal patrol packages, etc. of any lengths and weights at 500-/750-mm standard-benefit depth. Swivel electrifiable (by hand to max. 3 t of professional load). Standard height head bearer's filing 2.7 m. Heights to 9 m for the application of load forks with 2-professional suspension, od. Long good cassettes for Synchron-Haken-Ladetraverse. 2-, 3-, 4 and 5 stand standard-shelving units ready with company mounted, stand distances 1,200, 1,500 and 2,000 mm, od. on both sides, zul. Arm load 1,000 kg with immediately distributed load Benefit heights per field from 125 mm + N x 75 mm to 500 mm in various combinations. Accessories: Einlege-Blechwannen in 2 and 3-m length for adaptable camp property as well as short lengths and rest lengths. Professional division of the load hangers and material tubs by means of Steckbolzen. Wheel direction alternatively on the left od. on the right.

Load hanger serially 3/5-fold divideable for bigger kind variety.

Material tubs 6 / 10-fold divideable.

Professional heights in the Steckraster of 75 mm changeable.

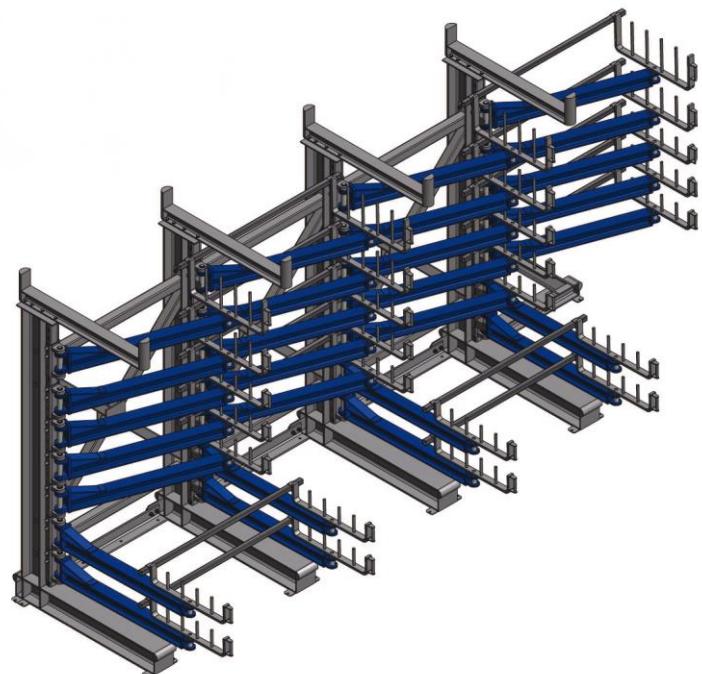
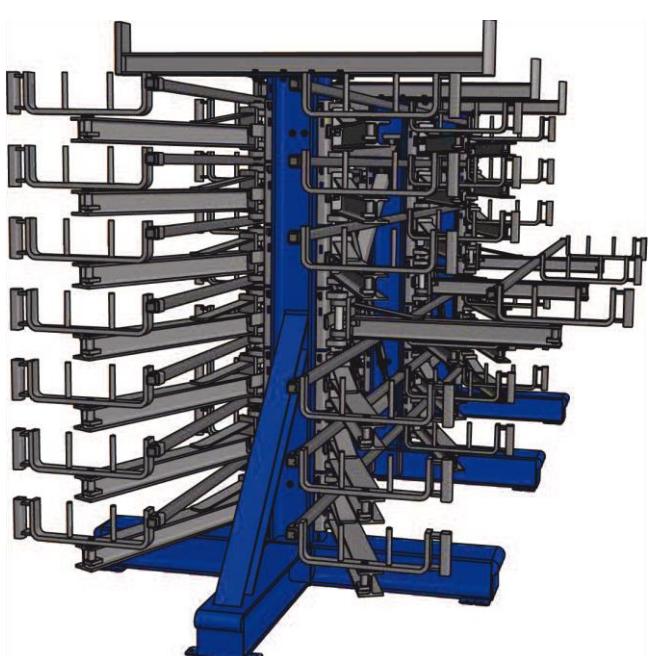
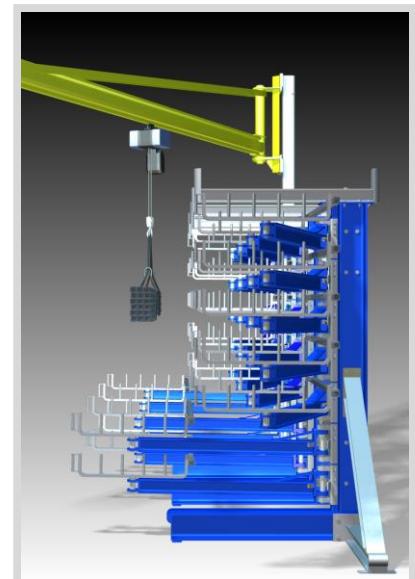
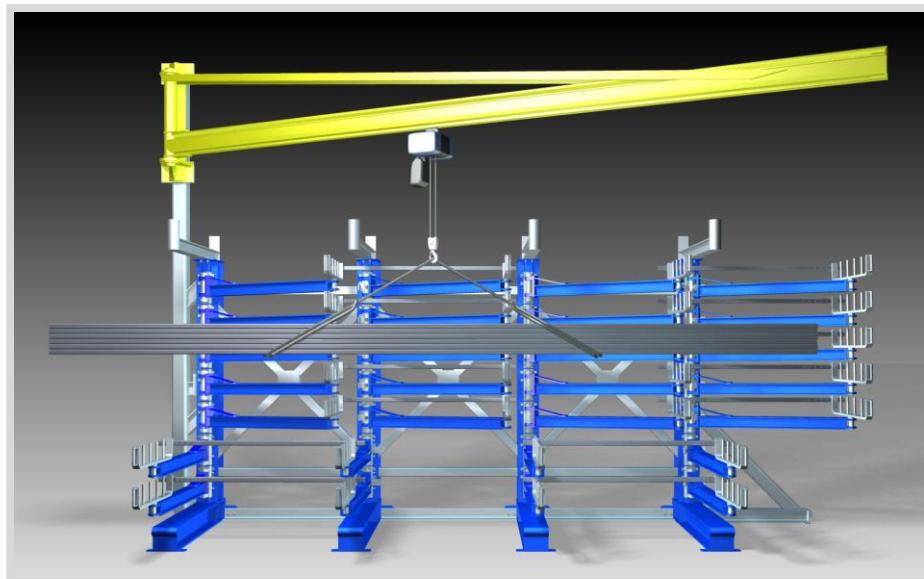
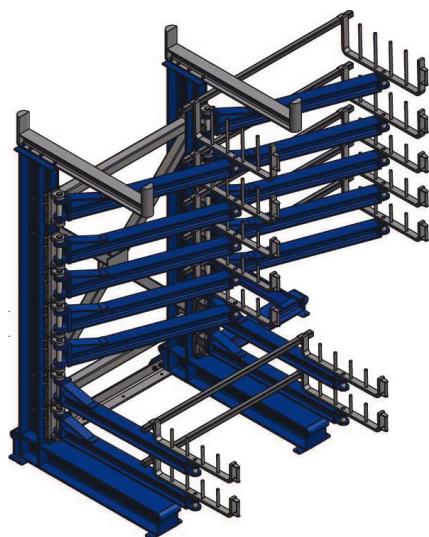
Double shelves with individual professional height creation of both sides.

Combination with back-sided not swillable out camp levels.

Stability without ground anchor realizable.

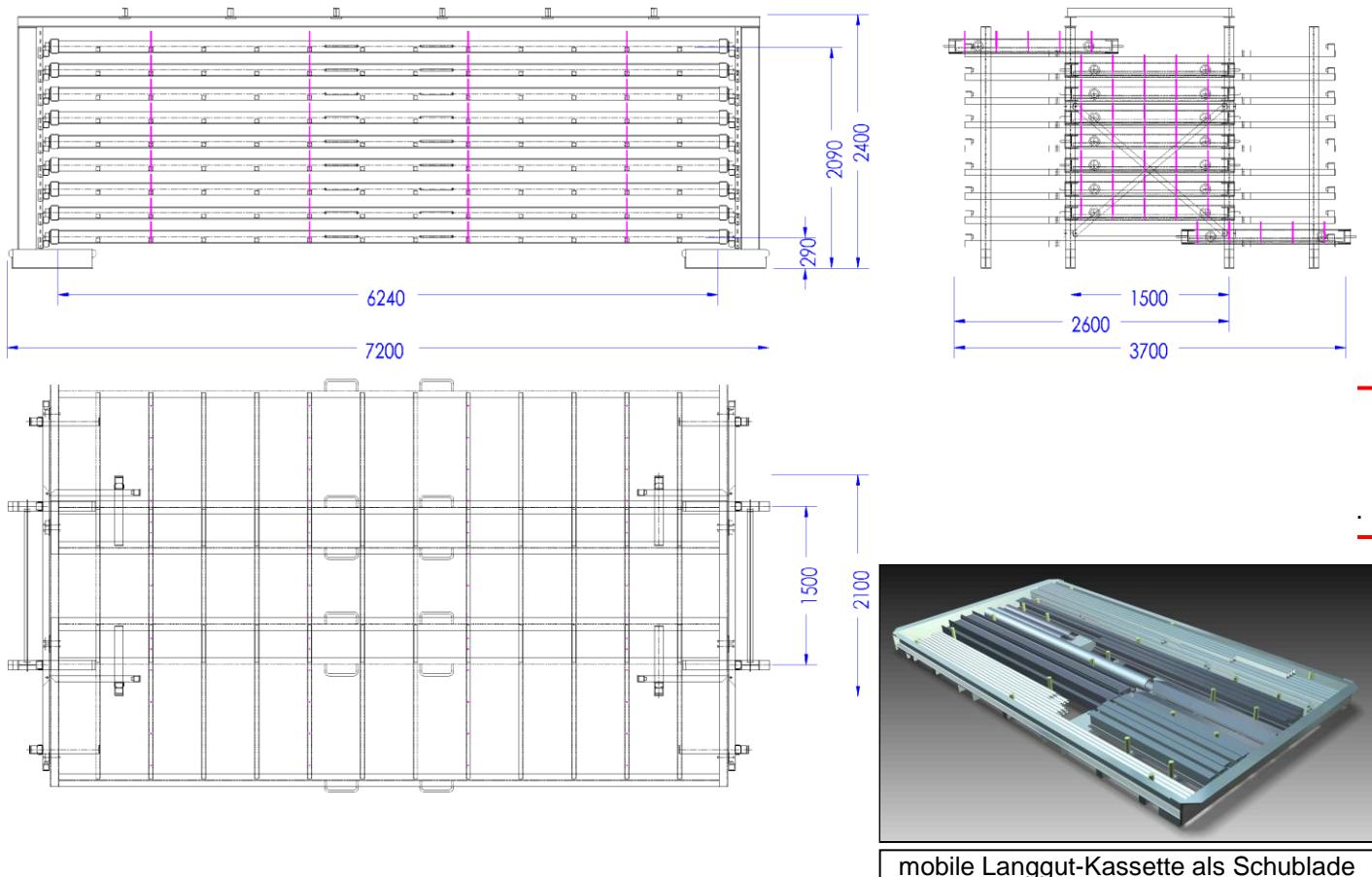
(Group stone, soft asphalt, under-floor heating, etc.)

ArmStrong® swingout®



RollyTower Long property

Sticks, pipes, profiles.... from the drawer



mobile Langgut-Kassette als Schublade

1 RollyTower LG
= 200 sorts stick material

... an invention of the **storemaster®** company Germany



RollyTower LangGut

An invention of the **storemaster®** company Germany

The drawer



Multiple metal packages
Drawer allocation

Stick material in the access
easily or hard - well sorts



careful Handling
for profiling rolls

10-t-pressure rollers
in electrified drawers



To stick material alliance
by **TowerCrane**



Competence + Innovation in Logistics Systems since 1967

Always going with the times (of the customer), **storemaster®** as a manufacturer and at that time still producing purely traditional warehouse equipping systems - after the successful use for decades of High-Tec highest power capability machine tools in the metal processing and polymer processing industries, had identified some 15 years ago a deficient, results-amortizing materials handling situation that went hand in hand with production islands becoming ever more comfortable and since then, as a global market leader, has been dealing with brainstorming, technical-creative implementation and continuous further development of materials handling warehouse systems that are exclusively being produced at Barsinghausen / Hannover with the aim of a more efficient material flow rate in the processing industries and its dealers.

store and more

for **storemaster®**, this signifies not only a customized, sophisticated design materials warehouse, but also including a type-related, as well as ergonomically-optimized, economically-optimized and safety-optimized materials handling in the flow and in harmony with the requirements from the production departments of the user.

This task is ideal for **storemaster®** as a medium-sized enterprise with decades of experience in warehouse technology, particularly also because we have never lost sight of the lean structure in management, administration, production and sales that we uphold and owing to which we therefore operate true to the motto: short, manageable and controllable routes, not only when it comes to materials handling planning for our customers but also living it when it is a matter of the management and daily operations of our own company and in interaction with customers and suppliers. We also understand our mission to be to contribute to process optimization in logistic chains and their interactions with other disciplines in the industry and in general human interaction. We do so in terms of a sustainable resource management through the development of innovative logistics systems.



storemaster GmbH + Co. KG • Reihekamp 1 • 30890 Barsinghausen • Post: **storemaster** • D-30884 Barsinghausen
HRA 101130 • Kompl.: **storemaster** Verwaltung GmbH • HRB 209576 • AG Hannover

Tel. +49(0)5105-7795-0 • Fax +49(0)5105-7795-79 • projekt@storemaster.de • www.towertec.de
Spark. Hannover • Blz 25050180 • Kto.-Nr. 0910144761 • IBAN: DE72 2505 0180 0910 1447 61 • BIC-/SWIFT-Code: SPKHDE2HXXX
Ust.-Id.-Nr. / Tax ID No.: DE115513319 • Zoll-Nr. / EORI No.: DE 6003516 / 73084090
Mitglied im DIN Deutschen Institut für Normung e.V.



storemaster®

has the solution ...

with
overview

and
foresight

... if it gets too narrow
on the floor...