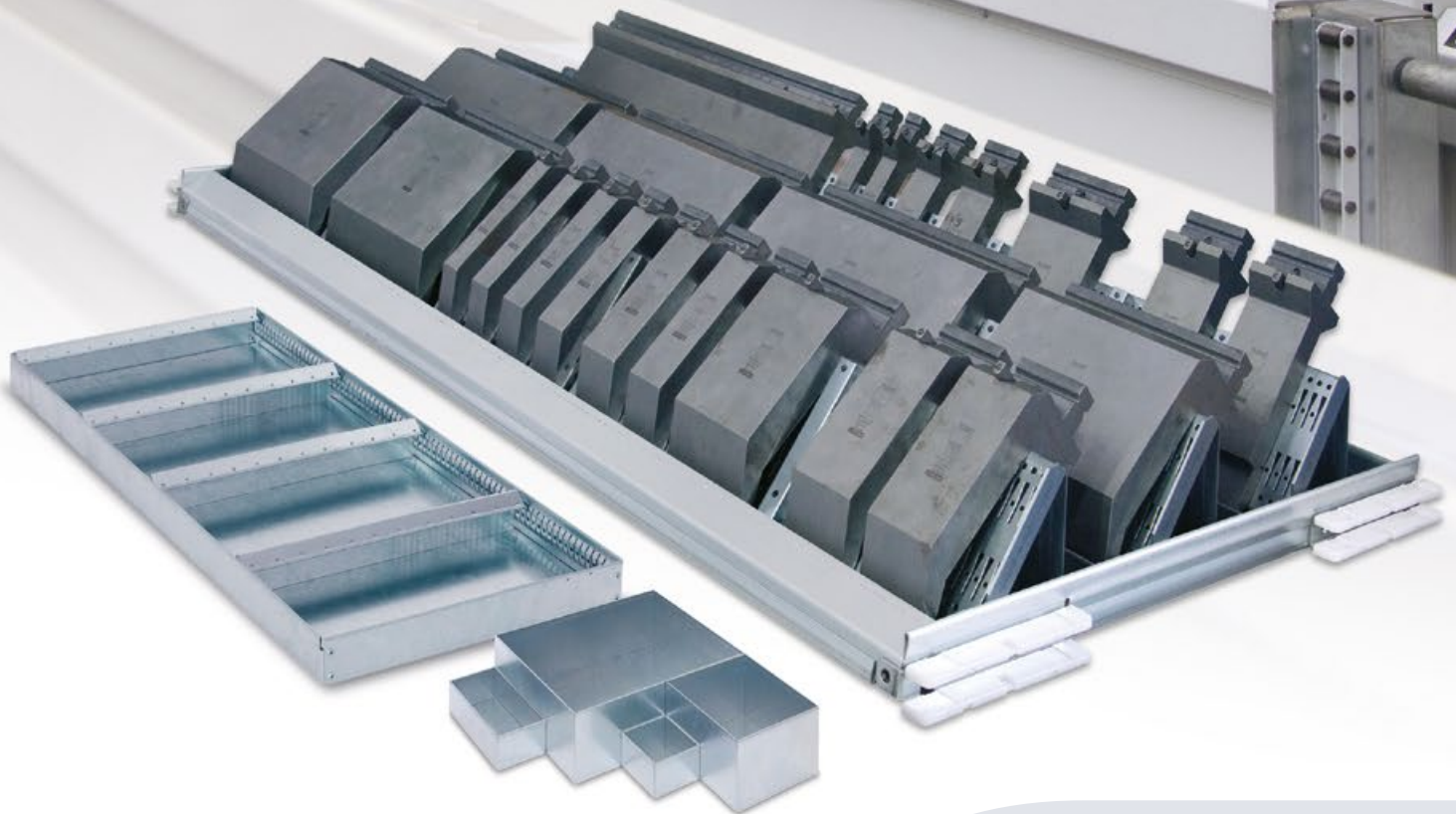




LTL Tool Tower Solutions





Your Apfel LTL Tool Tower Solutions team



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Tool Tower Solutions
by Apfel



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LTL tool tower solutions save time, space and money

Thanks to their complete utilization of available room heights and the unique tray system of 25 mm grid spacing, Apfel tool towers provide maximum stock capacities on minimum footprints.

With our state-of-the-art technology you store a myriad of goods at minimum space requirements to increase the efficiency of your company's facilities.

Our fully automated high-bay warehouse offers numerous benefits to facilitate the daily work in your business premises. By avoiding unnecessary movements, it makes an investment that pays for itself after only a short time.

Reduce your personnel expenses and eliminate non-productive operation time searching for and rearranging stored items. With our "goods-to-person" principle there is no need to haul your goods laboriously. Instead, they are delivered to you in an instant just with the press of a button.

When it comes to terms of safety, the tool tower can stand up to any comparison with conventional storing methods. Industrial accidents are virtually eliminated because there is no more necessity of ladders or forklifts as well as dropping down objects are a thing of the past. Furthermore, the improved ergonomics preserves the health of your employees.



Tool Tower Solutions
by Apfel



Benefit: time saving

Items are automatically delivered to the operator, eliminating wasted walk and search time.



Benefit: height utilization

The almost stepless storage on trays in a grid of just 25 mm distance saves up to 85% of space.



Benefit: ergonomics

There is no longer need for employees to bend over, climb or stretch to reach the stored items. The tool tower works on the „goods-to-person“ principle. The requested parts are automatically delivered to the ergonomically positioned access opening. The trays can even be driven to each user's specific working height.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.



Benefit: security

Controlled access to specific trays, or tracking which user accessed which tray, is also achievable. The LTL is equipped with shutter doors for increased safety of operators and protection of the stored items. Noise levels are also considerably decreased.



Benefit: flexibility

Each tray can be programmed according to operating parameters. Further options include slow speeds for fragile goods, storage of frequently required goods close to the "golden zone", access rights for trays, storage of trays with different weight capacities in one single unit, and much more.



Benefit: modularity

Modular design allows for heights to be changed quickly and inexpensively to meet changing facilities or workflow.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



Please check your floor load capacity!

The storage principle

The modular LTL tool tower is an enclosed system that stacks up trays in the front and rear of the unit.

The extractor device located in the centre of the tower delivers the trays with the stored items automatically to the access opening at the push of a button.

With each tray movement the internal management system monitors the actual weight and the loading height by different sensors to guarantee the perfect storage position and to prevent the overloading of the individual tray or the whole device.

Thanks to this intelligent technology, different height objects can be effectively stored in one device, from the smallest screw to the bulkiest workpiece.

For maximum protection of the stored goods and the operators, each device is equipped with a number of security elements.



Automatically driven shutter doors for increased safety and protection of stock plus decreased noise levels



The extractor device drives the tray to the access opening or to its storage location at adjustable speeds.



By each movement, the height sensors automatically check the current loading level of the tray.

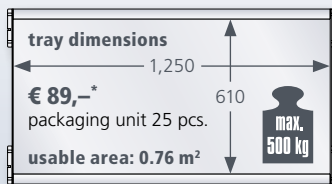


The integrated safety light curtain prevents personal injury and machine damage caused by operating errors.



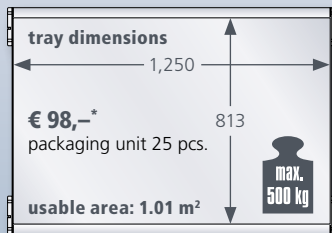
Please contact us via phone, fax or e-mail.
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Standard tray sizes (available at short notice)



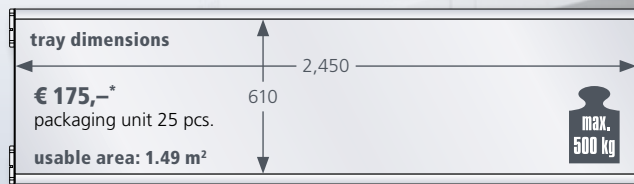
LTL 1260

tower dimensions: 1,580 w x 2,312 d
floor space: 3.65 m²



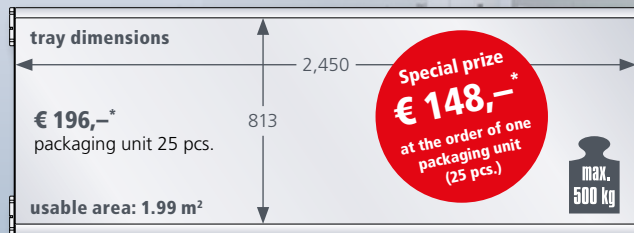
LTL 1280

tower dimensions: 1,580 w x 2,921 d
floor space: 4.61 m²



LTL 2460

tower dimensions: 2,780 w x 2,312 d
floor space: 6.42 m²



LTL 2480

tower dimensions: 2,780 w x 2,921 d
floor space: 8.12 m²

* Tray prices are exclusively applied in combination to Apfel tool towers

Many intelligent technical details create the highest operating comfort to guarantee an easy and effortless working at the tool tower.



The working position of the tray is individually adjustable to the needs of the operating personnel.



Simple operation by our user friendly software, easily adaptable to your ERP systems by optional interfaces.



Grid measurements

minimum distance from tray to tray

75 mm (incl. 50 mm filling height, Beladung bis 500 kg, up to 26 trays per meter unit height)

grid spacing 25 mm

distance between supports
50 mm

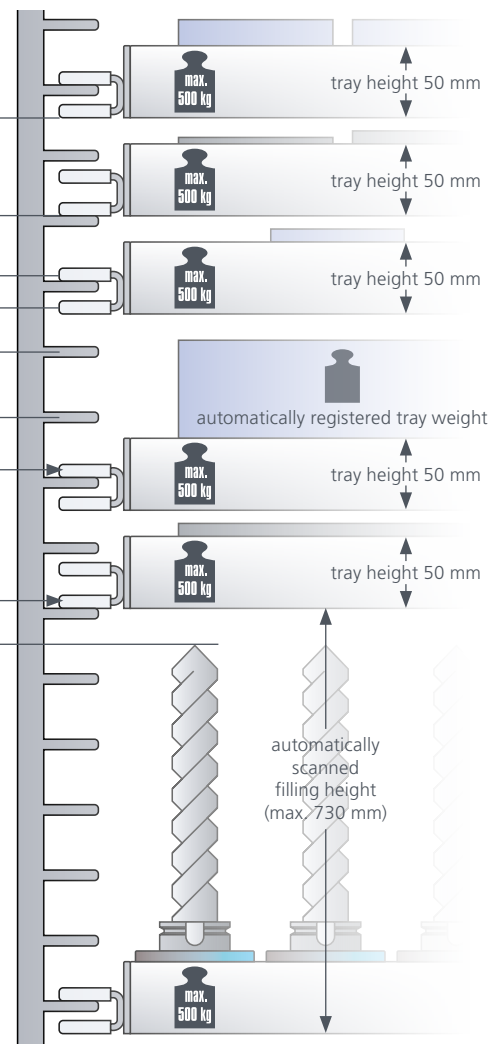
bottom-placed tray

top-placed tray

safety distance 25 mm



Tool Tower Solutions
by Apfel



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

LTL – the fully equipped tool tower solution by Apfel

Even the basic versions of our LTL tool tower solutions offer a number of technical features that other suppliers only provide as optionals against surcharge.

Inspection windows in the shutter doors and in both side panels give you full visual control of the moving and placement procedures.

The all around maintenance flaps mounted underneath the top cover, the extra high front drawer as well as the additional service door on the rear of the tool tower enable easy access during the installation and maintenance in case of breakdown.

A lowered minimum output height of 733 mm provides the individually adjustable ergonomic working position of the trays.

all around
maintenance flaps

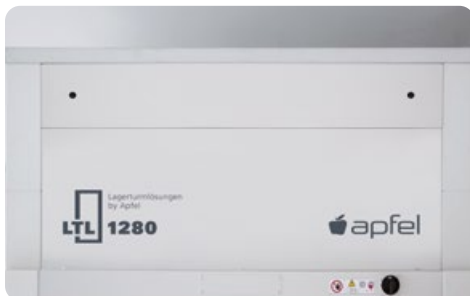
500 mm
cover plates

short
delivery
times

stabilizing
cross struts

Available
in heights
from 2.5 m
to 15 m
in any
500 mm
increment

The benefits of the Apfel LTL tool tower solutions



All around maintenance flaps underneath the top cover for easy access to the front, rear and both lateral parts of the device



Pre-equipped for all mounting positions of the control display: in an external housing on the left or right as well as integrated in the frontplate

RAL 9010

Overall height up
to 15 m without
wall mounting
due to 2.000 mm
frame components

Max.
66 t
total weight

shutter doors
with windows

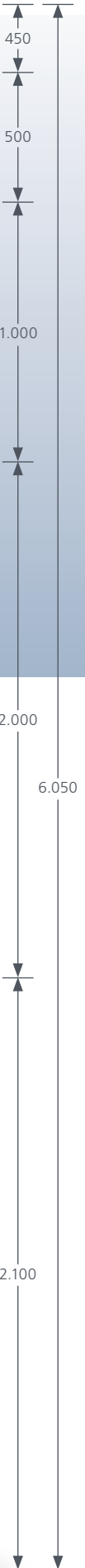
max.
500 kg

500 kg
payload
per tray

ergonomic output
height of 733 mm
instead of 833 mm

extended front
drawer height

With Ethernet
interface

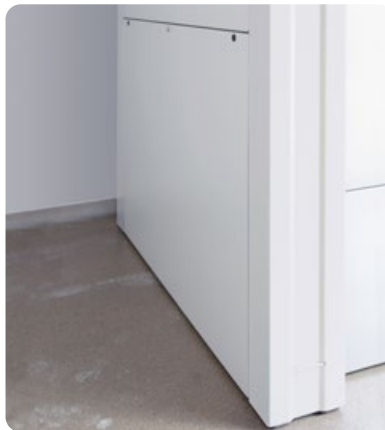


Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

All tools and the whole feedstock right by your machine

Due to their superior technology Apfel tool towers offer largest storage capacities at minimum width.

With LTL tool towers you save not only up to 75% storage area, but also reduce your ways, setup times and the risk of accidents.



The additional service door on the rear provides easy access to the rear mechanical parts.



The inspection windows on both sides of the tower enable the external control of trays and extractor device.



The modular frame components of 2.000, 1.000 or 500 mm length facilitate an easy height extension.



The integrated inspection windows of the shutter doors offer the view on the movement of tray and extractor device.



The built-in retro-reflective sensor for the tray detection saves maintenance costs and lowers installation effort.



Integrated in the front drawer's control unit, the electrical socket provides easy grid access for servicing equipment.



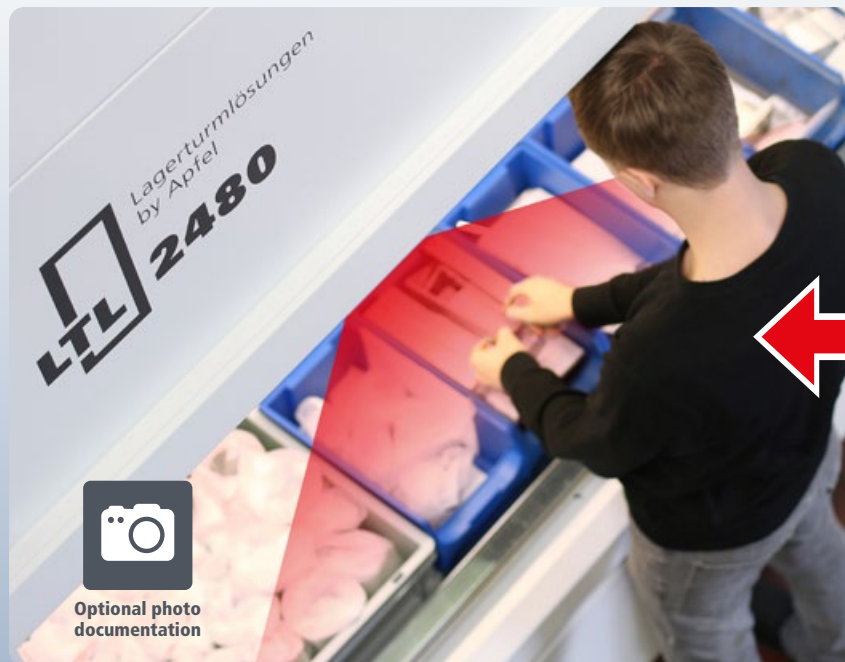
Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

LTL tool towers optimize your operating procedures

LTL storage towers do not only adapt perfectly to your spatial conditions, they also can be implemented quickly and easily into your inventory management software.

The built-in Ethernet interface as well as several in-house developed applications enable the integration into all common ERP systems, turning the LTL into a fully automated warehouse with complete control of receipt, issue and stock.

In addition, the optionally installable camera documents each traversing process and the current state of load of all stored trays online.



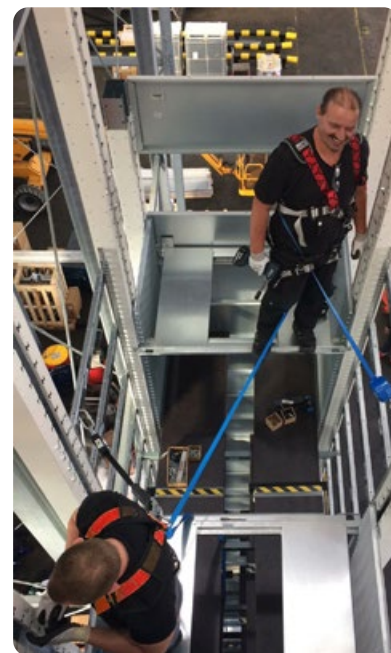
The modular system with increments of 500 mm for a maximum flexibility of the set-up



All LTL tool towers are available in increments of 500 mm from 2.5 to 15 meters in height and designed for a total payload of 66 tons. Due to the compatible structural components, they can be extended at any time and in case of relocation easily be disassembled and adapted to the new conditions.



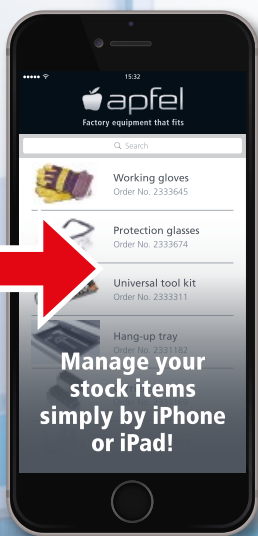
Because the LTL tool tower can be equipped with up to six access openings on both the front and the back, the entire stock can be shared from different floors. For this reason, the tool tower can easily replace an expensive and space-wasting freight elevator.



Our own, specially trained assembly team installs your tool tower reliably and precisely in no time. Even special solutions across multiple floors or a mounting in confined spaces conditions do not pose a problem. For the software integration our In-house technicians remain at your disposal.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.



**Manage your
stock items
simply by iPhone
or iPad!**

Industry 4.0 in a pants pocket

LTL tool towers with
optional management by
iPhone or iPad and online
documentation by the
integrated camera



Tool Tower Solutions
by Apfel

Lagerturmlösungen
by Apfel
LTL 2480

 **apfel**



Tool Tower Solutions
by Apfel

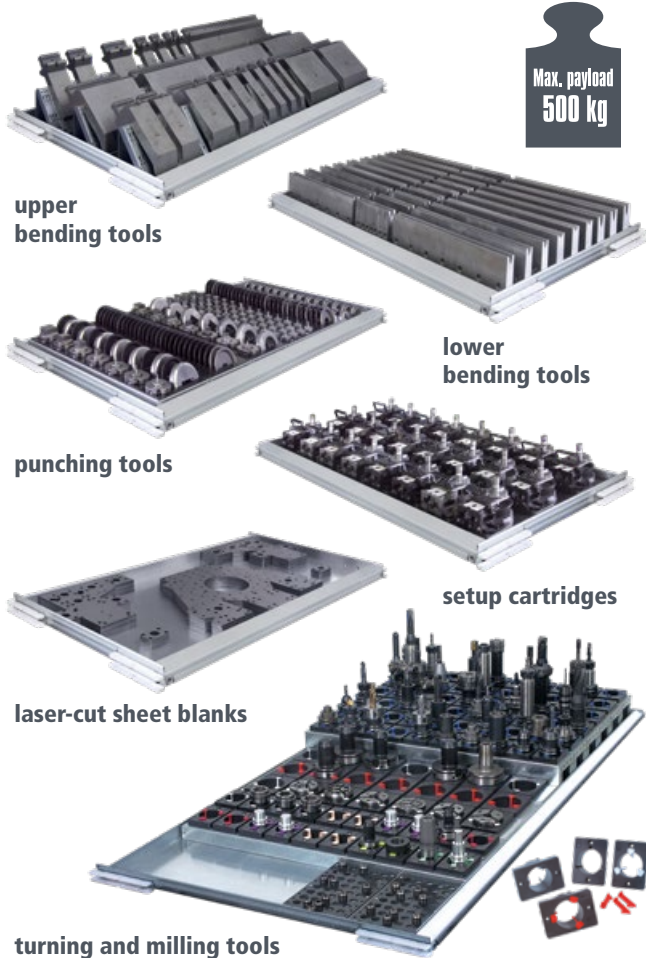
Easy tray removal with the retractable pull-out rack

With our optional pull-out rack you easily remove whole trays including the loaded goods of the tool tower.

All LTL tool tower versions can be optionally equipped with slide rollers for the mounting of the rack.



A later mounting is always possible



Max. payload
500 kg

The transport cart for safe tray removal



With our special transport cart you easily move the tray with its load to and from the tool tower. Thanks to the slide rollers integrated in all LTL versions you are able to pull out the tray from the access opening and secure it to the cart to maneuver your goods in a safe and manageable way.

The easy-to-handle carts with adjustable working height are available for all tray sizes and feature four swivel castors with brakes for a trouble-free handling.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500

Our starter
model with
just 3.65m²
floor space

LTL 1260 – heavy loads on the smallest of floor spaces

On its trays with a payload of 500 kg and a usable area of 0.76 m² the tool tower LTL 1260 stores large amounts of tools, high stacks of raw materials as well as all kinds of heavy goods.

The tray depth of 610 mm enables easy and ergonomic access to all stored items. Optional hoists are available to allow the safe and trouble-free displacement of heavyweight workpieces or materials by crane or forklift.

Automatic monitoring of the filling height and of the weight of every single tray as well as of the entire device ensure the maximum safety of movement and storage.

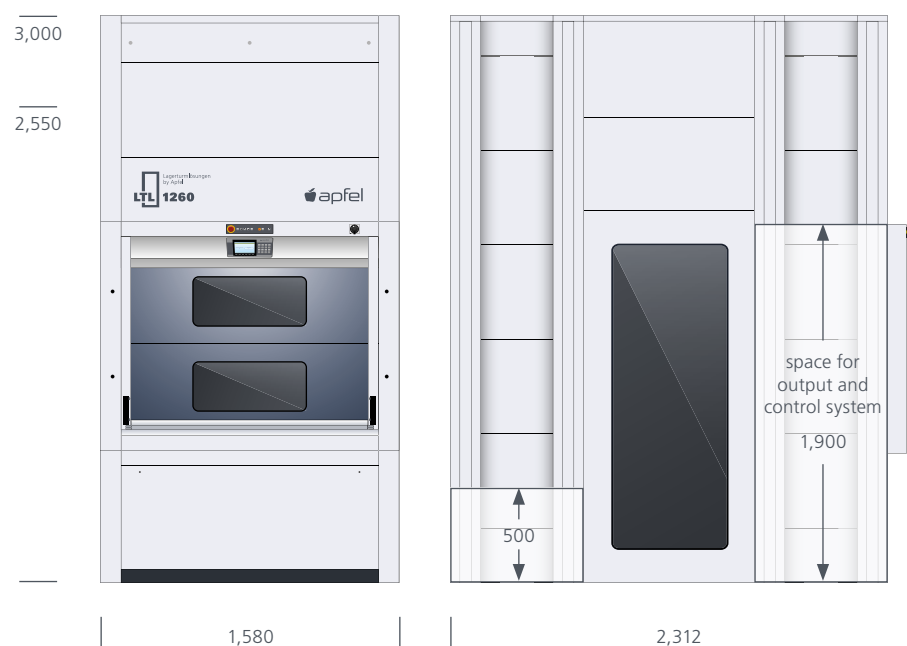
Due to their completely modular construction the tool towers are available in heights from 2.5 m to over 15 m in any 500 mm increment.

Example calculations of the total storage space at 300 mm tray distance (upper bending tools)

LTL 1260/5000	5,000 mm height (25 trays of 0.76 m ²) = total storage space 19.00 m²	storage space : floor space 5.21 : 1
LTL 1260/10000	10,000 mm height (58 trays of 0.76 m ²) = total storage space 44.08 m²	storage space : floor space 12.08 : 1
LTL 1260/15000	15,000 mm height (91 trays of 0.76 m ²) = total storage space 69.67 m²	storage space : floor space 19.09 : 1

Example calculations of the total storage space at 150 mm tray distance (lower bending tools)

LTL 1260/5000	5,000 mm height (50 trays of 0.76 m ²) = total storage space 38.00 m²	storage space : floor space 10.41 : 1
LTL 1260/10000	10,000 mm height (116 trays of 0.76 m ²) = total storage space 88.16 m²	storage space : floor space 24.15 : 1
LTL 1260/15000	15,000 mm height (182 trays of 0.76 m ²) = total storage space 138.32 m²	storage space : floor space 37.90 : 1



Max.
66t
total weight

Please check
your floor
load capacity!

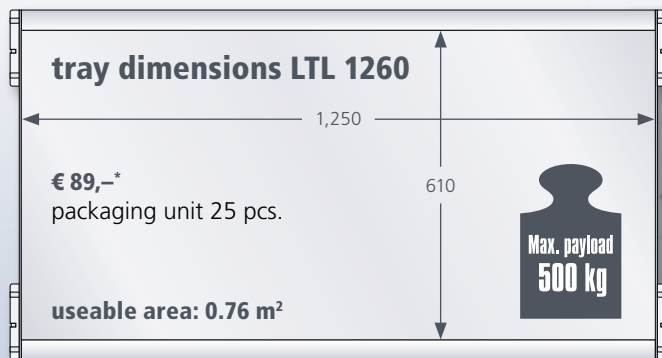
floor space:
1,580 x 2,312 mm
(3.65 m²)

minimum
output height

The
slim tool
tower for
limited floor
space




Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.



* Tray prices are exclusively applied
in combination to Apfel tool towers

LTL tool tower solutions are available
at short notice in the following colors:

 pure white RAL 9010

**Available
in heights
from 2.5 m
to 15 m
in any
500 mm
increment**

Maximum storage capacity for your upper and lower bending tools

Equipped with our tool carriers (see pages 29 - 30)
the LTL 1260 stores huge amounts of upper and
lower bending tools on a floor space of just about
3.6 m² and a front width of only 1,580 mm.

Example calculations

3,000 mm height

11 trays of approx. 3.6 m upper bending tools
or 23 trays of approx. 11 m lower bending tools

Total storage capacity

approx. 39 m upper bending tools

or approx. 253 m lower bending tools

5,000 mm height

25 trays of approx. 3.6 m upper bending tools
or 50 trays of approx. 11 m lower bending tools

Total storage capacity

approx. 90 m upper bending tools

or approx. 550 m lower bending tools

10,000 mm height

58 trays of approx. 3.6 m upper bending tools
or 116 trays of approx. 11 m lower bending tools

Total storage capacity

approx. 208 m upper bending tools

or approx. 1.276 m lower bending tools

The example calculations are based
on a tray to tray distance of at least
300 mm for upper bending tools and
at least 150 mm for lower bending tools.



Your interlocutor

Dirk Böcker

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**Optional photo
documentation**



**With Ethernet
interface**



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator.
We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500

**Our
bestseller
with 1,580 mm
front width**

LTL 1280 – maximum storage capacity at minimum front width

Thanks to its efficient use of the room height, Apfel tool towers provide even in confined spatial conditions an immense storage capacity that cannot be achieved by any conventional system.

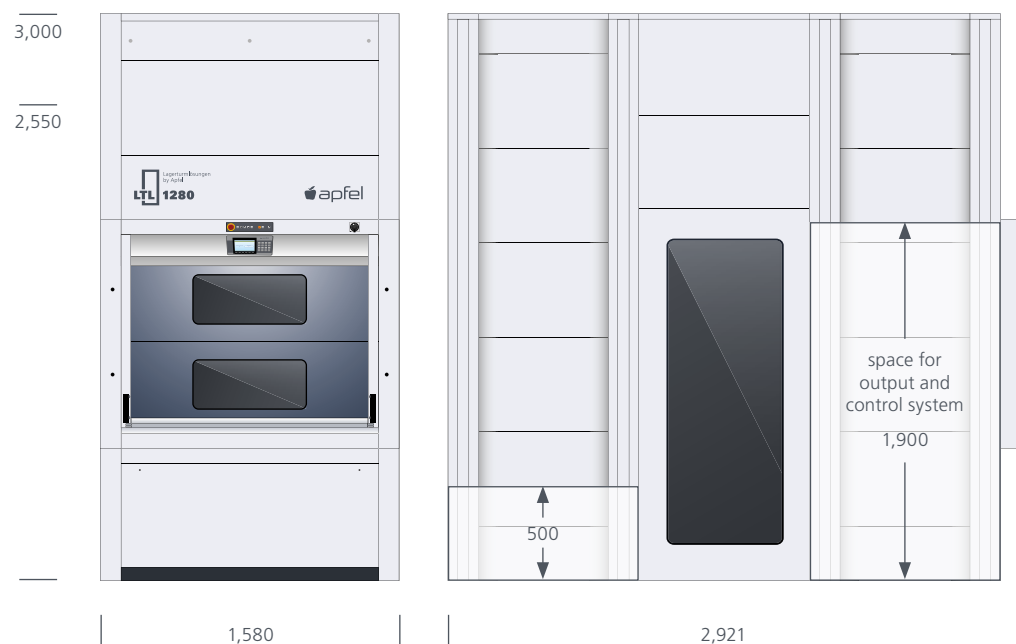
The trays with a payload of 500 kg and a usable space of approx. 1 m² create numerous possibilities for the safe and material-friendly storage of many heavy goods in just one single enclosure.

In automated production processes with a high rate of handling tools, raw materials or semi-finished parts the LTL 1280 suits perfectly as an intelligent storage device for various industrial and technical applications.

Due to their completely modular construction the tool towers are available in heights from 2.5 m to over 15 m in any 500 mm increment.

Example calculations of the total storage space at a tray to tray distance of 100 mm

LTL 1280/3000	3,000 mm height (35 trays of 1.01 m ²) = total storage space 35.35 m²	storage space : floor space 7.67 : 1
LTL 1280/5000	5,000 mm height (75 trays of 1.01 m ²) = total storage space 75.75 m²	storage space : floor space 16.43 : 1
LTL 1280/7000	7,000 mm height (115 trays of 1.01 m ²) = total storage space 116.15 m²	storage space : floor space 25.20 : 1
LTL 1280/9000	9,000 mm height (155 trays of 1.01 m ²) = total storage space 156.55 m²	storage space : floor space 33.96 : 1
LTL 1280/11000	11,000 mm height (195 trays of 1.01 m ²) = total storage space 196.95 m²	storage space : floor space 42.72 : 1
LTL 1280/13000	13,000 mm height (235 trays of 1.01 m ²) = total storage space 237.35 m²	storage space : floor space 51.49 : 1
LTL 1280/15000	15,000 mm height (275 trays of 1.01 m ²) = total storage space 277.75 m²	storage space : floor space 60.25 : 1



**Max.
66 t
total weight**

Please check
your floor
load capacity!

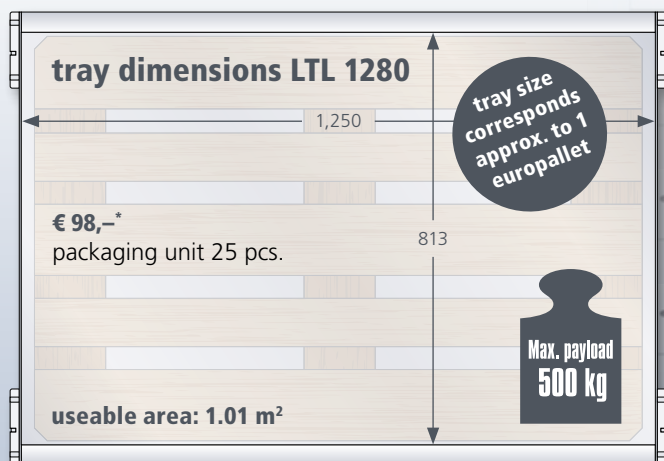
floor space:
1,580 x 2,921 mm
(4.61 m²)

minimum
output height
733

**Ready
for delivery
within 48 h
while stocks
last**




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* Tray prices are exclusively applied
in combination to Apfel tool towers

LTL tool tower solutions are available
at short notice in the following colors:

 pure white RAL 9010

Available
in heights
from 2.5 m
to 15 m
in any
500 mm
increment

Maximum storage capacity for your turning and milling tools

Equipped with our tool carriers (see pages 24 - 27)
the LTL 1280 stores huge amounts of turning and
milling tools on a floor space of just about 4.6 m²
and a front width of only 1,580 mm.

Example calculations

3,000 mm height = 12 trays of 100 tools
Total storage capacity max. 1,200 tools

4,000 mm height = 19 trays of 100 tools
Total storage capacity max. 1,900 tools

5,000 mm height = 25 trays of 100 tools
Total storage capacity max. 2,500 tools

6,000 mm height = 32 trays of 100 tools
Total storage capacity max. 3,200 tools

7,000 mm height = 38 trays of 100 tools
Total storage capacity max. 3,800 tools

8,000 mm height = 45 trays of 100 tools
Total storage capacity max. 4,500 tools

9,000 mm height = 52 trays of 100 tools
Total storage capacity max. 5,200 tools

10,000 mm height = 58 trays of 100 tools
Total storage capacity max. 5,800 tools

The example calculations are based
on a placement of SK 40 tools with a
tray to tray distance of at least 300 mm.



Your interlocutor

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Optional photo
documentation



With Ethernet
interface



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator.
We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500

LTL 2460 – optimal overview of many items on just one tray

Thanks to the direct access to its trays of 2.450 mm width and just 610 mm depth the LTL 2460 suits perfectly the automated storage of large amounts of various small items.

Whether in the spare parts shipment, the tool output or the logistic centre – wherever it is necessary to reach thousands of articles in different quantities and dimensions, the LTL 2460 is the ideally sized tool tower.

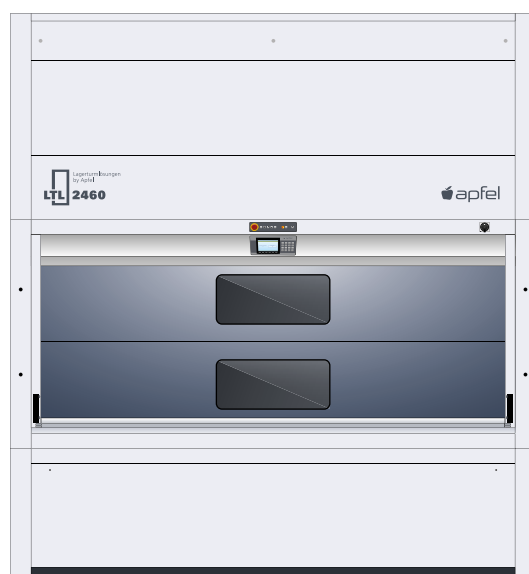
Due to their completely modular construction the tool towers are available in heights from 2.5 m to over 15 m in any 500 mm increment.

Our large selection of professional equipment components offers the most possibilities for safe, proper and material-friendly storage of your entire warehouse stock.

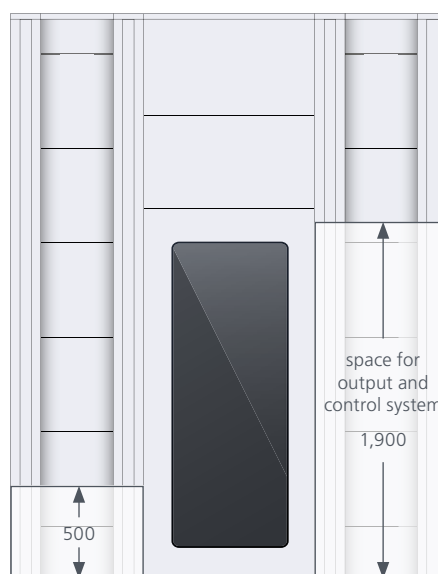
Example calculations of the total storage space at a tray to tray distance of 200 mm

LTL 2460/3000	3,000 mm height (18 trays of 1.49 m ²) = total storage space 26.82 m²	storage space : floor space 4.17 : 1
LTL 2460/5000	5,000 mm height (38 trays of 1.49 m ²) = total storage space 56.62 m²	storage space : floor space 8.81 : 1
LTL 2460/7000	7,000 mm height (58 trays of 1.49 m ²) = total storage space 86.42 m²	storage space : floor space 13.44 : 1
LTL 2460/9000	9,000 mm height (78 trays of 1.49 m ²) = total storage space 116.22 m²	storage space : floor space 18.07 : 1
LTL 2460/11000	11,000 mm height (98 trays of 1.49 m ²) = total storage space 146.02 m²	storage space : floor space 22.74 : 1
LTL 2460/13000	13,000 mm height (118 trays of 1.49 m ²) = total storage space 175.82 m²	storage space : floor space 27.39 : 1
LTL 2460/15000	15,000 mm height (138 trays of 1.49 m ²) = total storage space 205.62 m²	storage space : floor space 32.03 : 1

3,000
2,550



2,780



2,312



Please check your floor load capacity!

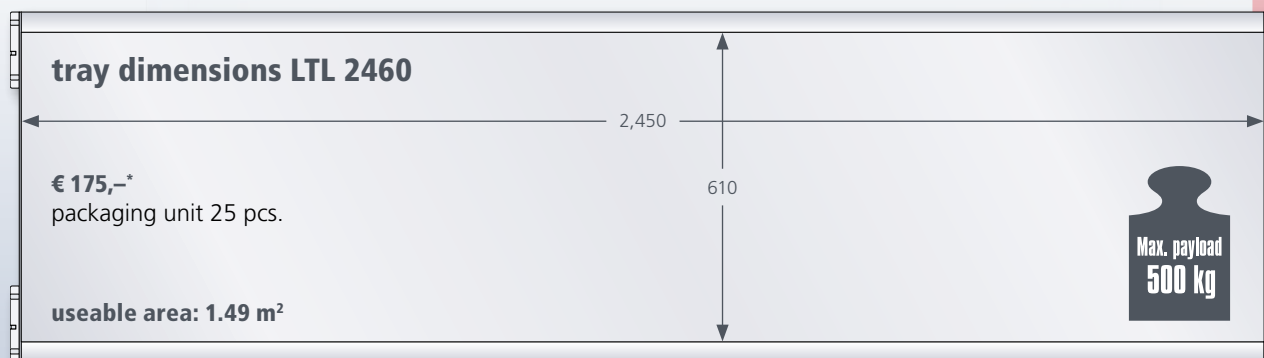
floor space:
2,780 x 2,312 mm
(6.42 m²)

minimum output height

733




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in combination to Apfel tool towers

LTL tool tower solutions are available
at short notice in the following colors:

 pure white RAL 9010

**Available
in heights
from 2.5 m
to 15 m
in any
500 mm
increment**

**The
wide tool
tower for
limited floor
space**



Your interlocutor

Dirk Böcker

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d.boecker@apfel-gmbh.de

Lagerturm Lösungen
by Apfel
LTL 2460

apfel

apfel



**Optional photo
documentation**



**With Ethernet
interface**



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator.
We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

↑
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500

LTL 2480 dimensions and storage capacity

LTL 2480 – nearly 2 m² useable area on just one single tray

Access your entire warehouse stock in a fast, fully automated and well arranged way.

Thanks to their efficient use of the room height, Apfel tool towers provide even in confined spatial conditions an immense storage capacity that cannot be achieved by any conventional system.

Even with the basic unit of 3,000 mm height you multiply your storage area to more than a fourfold of your floor space.

With an increasing structure height, space saving becomes more and more effective. Depending on the equipment components and its arrangement it can even reach up to 95%.

Due to their completely modular construction the tool towers are available in heights from 2.5 m to over 15 m in any 500 mm increment.

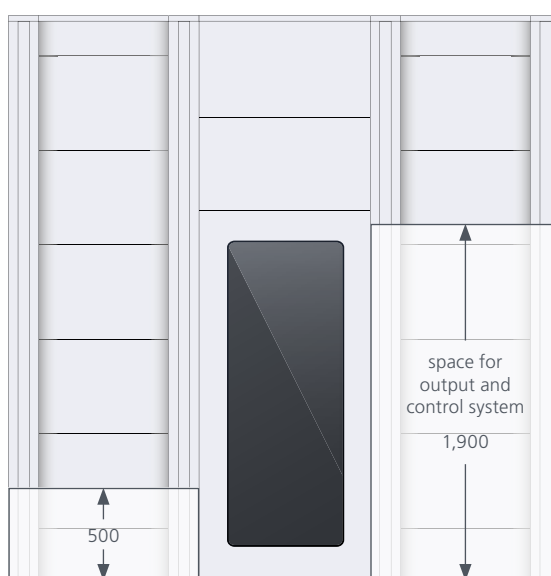
Example calculations of the total storage space at a tray to tray distance of 200 mm

LTL 2480/3000	3,000 mm height (18 trays of 1.99 m ²) = total storage space 35.82 m²	storage space : floor space 4.41 : 1
LTL 2480/5000	5,000 mm height (38 trays of 1.99 m ²) = total storage space 75.62 m²	storage space : floor space 9.31 : 1
LTL 2480/7000	7,000 mm height (58 trays of 1.99 m ²) = total storage space 115.42 m²	storage space : floor space 14.21 : 1
LTL 2480/9000	9,000 mm height (78 trays of 1.99 m ²) = total storage space 155.22 m²	storage space : floor space 19.12 : 1
LTL 2480/11000	11,000 mm height (98 trays of 1.99 m ²) = total storage space 195.02 m²	storage space : floor space 24.02 : 1
LTL 2480/13000	13,000 mm height (118 trays of 1.99 m ²) = total storage space 234.82 m²	storage space : floor space 28.92 : 1
LTL 2480/15000	15,000 mm height (138 trays of 1.99 m ²) = total storage space 274.62 m²	storage space : floor space 33.82 : 1

3,000
2,550



2,780



2,921

Max.
66t
total weight

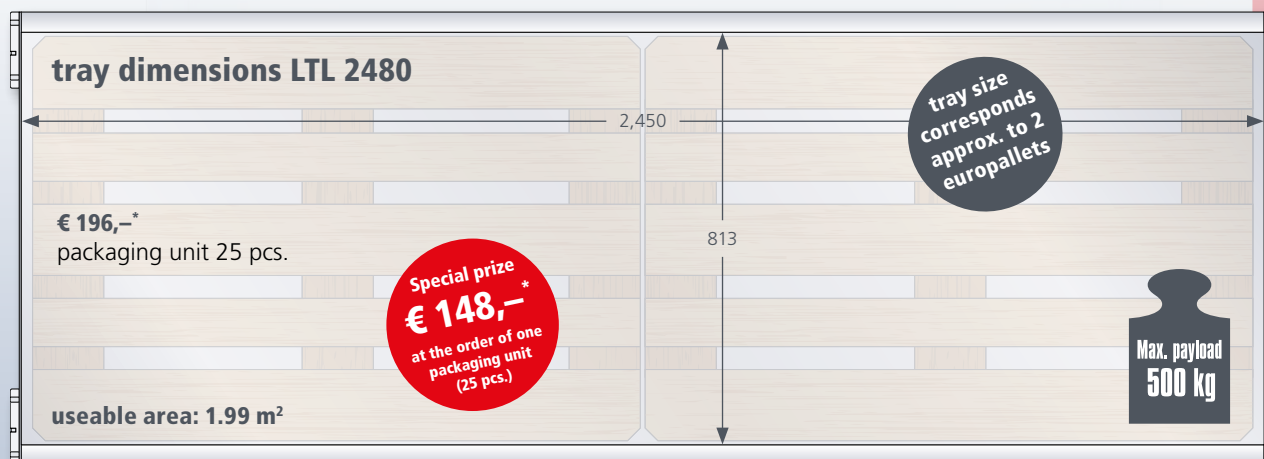
Please check your floor load capacity!

floor space:
2,780 x 2,921 mm
(8.12 m²)

↑
minimum output height
733
↓




Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.



* Tray prices are exclusively applied
in combination to Apfel tool towers

LTL tool tower solutions are available
at short notice in the following colors:

 pure white RAL 9010

Available
in heights
from 2.5 m
to 15 m
in any
500 mm
increment

**Ready
for delivery
within 48 h**
while stocks
last



Your interlocutor

Dirk Böcker

Phone +49 6221 8761-15

d.boecker@apfel-gmbh.de



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator.
We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

LTL – the storage system for universal use

The LTL tool tower offers even greater flexibility thanks to various options available pre or post installation.

It can be resized, moved and altered to meet changing business, facility and application requirements.

The system can be installed in the direct vicinity of a production line in order to increase productivity and reduce floor space requirements.

The high-precision control of the trays enables the LTL to be used as an intelligent storing and handling system with buffer functions for a fully automated robot-based production.

Our barcode scanners, optical guidance systems or hardware interfaces ensure trouble-free integration into your individual warehouse management software or ERP system.

For an optimum use of space the tool tower can even connect several floors or be installed outside the building with pass-through access.



Optional hoist and transport devices

To improve the handling of heavy and bulky goods which require the aid of lifting gear, the full tray extraction device facilitates to completely pull out the entire tray.

Therefore the goods can easily be picked up from each direction by crane, transpallet or forklift to be transferred or moved for further use.

For optimal adaptation to your operational requirements, manual, automatic, permanently installed or retractable versions of extraction devices are available depending on type and frequency of use.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.



Perfect adaption to the building situation

Tool towers with up to six access openings on the front or rear side can go through several floors. A mezzanine floor can be installed to enable the simultaneous operation on several levels (with loading at one level or side and retrieval at the other).

The automatic, high-precision tray runner makes the LTL tool tower solution a complete storing system for a fully automated robot-based production chain.

To increase the existing facility capacity, LTL tool tower solutions can be installed outside the building and skilfully walled in with a pass-through access.



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For any request or order you are welcome to send us a photo via your smartphone.



Enhance the possibilities of your lift system and put your individual and efficient warehouse strategy into practice – Apfel components for flexible tray configuration and optimum storage density.



Whether in the spare parts shipment, the tool output or the logistic centre – Apfel components arrange for maximum utilisation of space, suitable tray loading, and, therefore, optimal operation procedures.

Expand your warehouse capacity and shorten your access times by the individual division and the operation-adapted combination of different stored goods.

Tool holders with precisely fitting bolted sockets and adapter plugs store machining tools of all shank types.

With our screw-fastened divider plate frames you stockpile biggest amounts of packaged or bulk materials.

Snap-fastened slot grid frames with length and crosswise dividers enable the almost stepfree segmentation of the tray.

Storage boxes in many different sizes stow away your picking goods and small parts clearly structured and perfectly secured.

Use all the storage possibilities of your lift system to load your trays in an efficient and sustainable order to reduce access times!



With our specially designed equipment components you store largest amounts of the most various goods in a needs-oriented and clearly arranged way.

All our solutions ensure the maximum utilization of your capacities and ensure considerable savings and simplifications in the handling your stored goods.



With the help of our configurator you can easily put your tray assembly together and plan the stocking of your articles in detail.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



Please contact us via phone, fax or e-mail.
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The perfect system for the professional, space-saving storage of cutting tools

The unique Apfel storage system stocks all common milling and turning tools in specially designed tool carriers of galvanised steel that are equipped with bolted sockets and adapter plugs.

Available in different heights and lengths the tool carriers match to maximize use of space of your facility's warehouse capacity.



removable
tool carrier



variable
tool holder



compatible to
WSW trolleys

The well-arranged, material-friendly and proper system to store and transport your tools



WSW 800

The WSW workshop trolley with its compatible equipment transports your tools safely and gently to wherever they are needed.

The exact fit in the holders provides a precise, clean and material-friendly handling of all common types of milling and turning tools.

Customized paintwork in RAL colors at a low extra charge.

For each tool type such as SK, HSK, VDI, ABS or Capto, the bolted tool sockets are equipped with coloured adapter plugs.

The modular system of holders and plugs creates individual setup possibilities for more than 20 types of tools in just two different socket diameters (56 and 70 mm).

For the storage of collets and particular tools we provide a vast range of specially engineered accessories.


































Tool carriers with differently
configured hook combinations



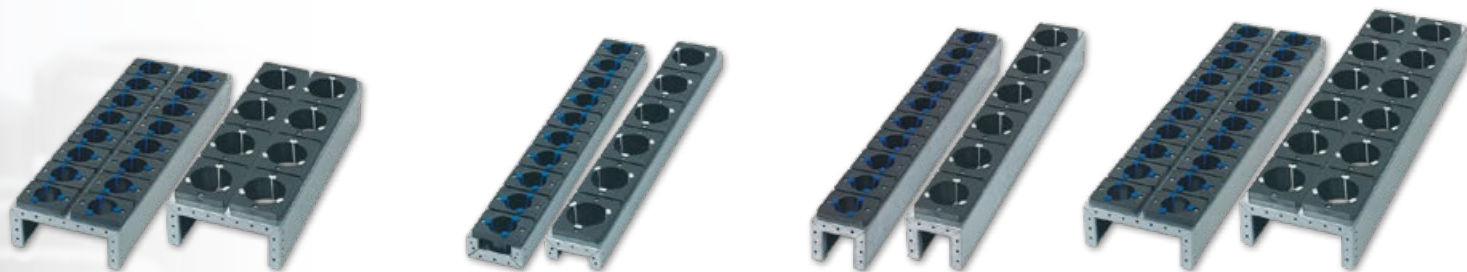
Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

Apfel tool carriers – the clever system for a well-arranged and material-friendly storage



tool carrier			WKT 600		WWR 600	
dimensions			595 l x 118 w x 50 h		595 l x 118 w x 100 h	
	HSK 40		8 tools	_____ pcs. WKT 050 118 595 011	8 tools	_____ pcs. WWR 100 118 595 011
	HSK 50		8 tools	_____ pcs. WKT 050 118 595 012	8 tools	_____ pcs. WWR 100 118 595 012
	HSK 63		8 tools	_____ pcs. WKT 050 118 595 013	8 tools	_____ pcs. WWR 100 118 595 013
	HSK 63-F		8 tools	_____ pcs. WKT 050 118 595 014	8 tools	_____ pcs. WWR 100 118 595 014
	HSK 80		4 tools	_____ pcs. WKT 050 118 595 015	4 tools	_____ pcs. WWR 100 118 595 015
	HSK 100		4 tools	_____ pcs. WKT 050 118 595 016	4 tools	_____ pcs. WWR 100 118 595 016
	SK 30		8 tools*	_____ pcs. WKT 050 118 595 021	8 tools	_____ pcs. WWR 100 118 595 021
	SK 40		8 tools*	_____ pcs. WKT 050 118 595 022	8 tools	_____ pcs. WWR 100 118 595 022
	SK 50		4 tools*	_____ pcs. WKT 050 118 595 023	4 tools*	_____ pcs. WWR 100 118 595 023
	Capto C3		8 tools*	_____ pcs. WKT 050 118 595 031	8 tools	_____ pcs. WWR 100 118 595 031
	Capto C4		8 tools*	_____ pcs. WKT 050 118 595 032	8 tools	_____ pcs. WWR 100 118 595 032
	Capto C5		8 tools*	_____ pcs. WKT 050 118 595 033	8 tools	_____ pcs. WWR 100 118 595 033
	Capto C6		8 tools*	_____ pcs. WKT 050 118 595 034	8 tools	_____ pcs. WWR 100 118 595 034
	Capto C8		4 tools*	_____ pcs. WKT 050 118 595 035	4 tools	_____ pcs. WWR 100 118 595 035
	VDI 20		8 tools*	_____ pcs. WKT 050 118 595 041	8 tools	_____ pcs. WWR 100 118 595 041
	VDI 25		8 tools*	_____ pcs. WKT 050 118 595 042	8 tools	_____ pcs. WWR 100 118 595 042
	VDI 30		8 tools*	_____ pcs. WKT 050 118 595 043	8 tools	_____ pcs. WWR 100 118 595 043
	VDI 40		8 tools*	_____ pcs. WKT 050 118 595 044	8 tools	_____ pcs. WWR 100 118 595 044
	VDI 50		8 tools*	_____ pcs. WKT 050 118 595 045	8 tools*	_____ pcs. WWR 100 118 595 0445
	VDI 60		4 tools*	_____ pcs. WKT 050 118 595 046	4 tools*	_____ pcs. WWR 100 118 595 0446
	ABS 50		8 tools*	_____ pcs. WKT 050 118 595 051	8 tools	_____ pcs. WWR 100 118 595 051
	ABS 63		8 tools*	_____ pcs. WKT 050 118 595 052	8 tools	_____ pcs. WWR 100 118 595 052
	ABS 80		8 tools*	_____ pcs. WKT 050 118 595 053	4 tools	_____ pcs. WWR 100 118 595 053
	UTS 63		8 tools*	_____ pcs. WKT 050 118 595 061	8 tools	_____ pcs. WWR 100 118 595 061
	UTS 80		4 tools*	_____ pcs. WKT 050 118 595 062	4 tools	_____ pcs. WWR 100 118 595 062
	173 E		8 tools*	_____ pcs. WKT 050 118 595 071	8 tools	_____ pcs. WWR 100 118 595 071
price			61,00		64,00	





WDR 600		WKT 810		WWR 810		WDR 810	
595 l x 236 w x 100 h		810 l x 118 w x 50 h		810 l x 118 w x 100 h		810 l x 236 w x 100 h	
16 tools	_____ pcs. WDR 100 236 595 011	10 tools	_____ pcs. WKT 050 118 810 011	10 tools	_____ pcs. WWR 100 118 810 011	20 tools	_____ pcs. WDR 100 236 810 011
16 tools	_____ pcs. WDR 100 236 595 012	10 tools	_____ pcs. WKT 050 118 810 012	10 tools	_____ pcs. WWR 100 118 810 012	20 tools	_____ pcs. WDR 100 236 810 012
16 tools	_____ pcs. WDR 100 236 595 013	10 tools	_____ pcs. WKT 050 118 810 013	10 tools	_____ pcs. WWR 100 118 810 013	20 tools	_____ pcs. WDR 100 236 810 013
16 tools	_____ pcs. WDR 100 236 595 014	10 tools	_____ pcs. WKT 050 118 810 014	10 tools	_____ pcs. WWR 100 118 810 014	20 tools	_____ pcs. WDR 100 236 810 014
8 tools	_____ pcs. WDR 100 236 595 015	6 tools	_____ pcs. WKT 050 118 810 015	6 tools	_____ pcs. WWR 100 118 810 015	12 tools	_____ pcs. WDR 100 236 810 015
8 tools	_____ pcs. WDR 100 236 595 016	6 tools	_____ pcs. WKT 050 118 810 016	6 tools	_____ pcs. WWR 100 118 810 016	12 tools	_____ pcs. WDR 100 236 810 016
16 tools	_____ pcs. WDR 100 236 595 021	10 tools*	_____ pcs. WKT 050 118 810 021	10 tools	_____ pcs. WWR 100 118 810 021	20 tools	_____ pcs. WDR 100 236 810 021
16 tools	_____ pcs. WDR 100 236 595 022	10 tools*	_____ pcs. WKT 050 118 810 022	10 tools	_____ pcs. WWR 100 118 810 022	20 tools	_____ pcs. WDR 100 236 810 022
8 tools*	_____ pcs. WDR 100 236 595 023	6 tools*	_____ pcs. WKT 050 118 810 023	6 tools*	_____ pcs. WWR 100 118 810 023	12 tools*	_____ pcs. WDR 100 236 810 023
16 tools	_____ pcs. WDR 100 236 595 031	10 tools*	_____ pcs. WKT 050 118 810 031	10 tools	_____ pcs. WWR 100 118 810 031	20 tools	_____ pcs. WDR 100 236 810 031
16 tools	_____ pcs. WDR 100 236 595 032	10 tools*	_____ pcs. WKT 050 118 810 032	10 tools	_____ pcs. WWR 100 118 810 032	20 tools	_____ pcs. WDR 100 236 810 032
16 tools	_____ pcs. WDR 100 236 595 033	10 tools*	_____ pcs. WKT 050 118 810 033	10 tools	_____ pcs. WWR 100 118 810 033	20 tools	_____ pcs. WDR 100 236 810 033
16 tools	_____ pcs. WDR 100 236 595 034	10 tools*	_____ pcs. WKT 050 118 810 034	10 tools	_____ pcs. WWR 100 118 810 034	20 tools	_____ pcs. WDR 100 236 810 034
8 tools	_____ pcs. WDR 100 236 595 035	6 tools*	_____ pcs. WKT 050 118 810 035	6 tools	_____ pcs. WWR 100 118 810 035	12 tools	_____ pcs. WDR 100 236 810 035
16 tools	_____ pcs. WDR 100 236 595 041	10 tools*	_____ pcs. WKT 050 118 810 041	10 tools	_____ pcs. WWR 100 118 810 041	20 tools	_____ pcs. WDR 100 236 810 041
16 tools	_____ pcs. WDR 100 236 595 042	10 tools*	_____ pcs. WKT 050 118 810 042	10 tools	_____ pcs. WWR 100 118 810 042	20 tools	_____ pcs. WDR 100 236 810 042
16 tools	_____ pcs. WDR 100 236 595 043	10 tools*	_____ pcs. WKT 050 118 810 043	10 tools	_____ pcs. WWR 100 118 810 043	20 tools	_____ pcs. WDR 100 236 810 043
16 tools	_____ pcs. WDR 100 236 595 044	10 tools*	_____ pcs. WKT 050 118 810 044	10 tools	_____ pcs. WWR 100 118 810 044	20 tools	_____ pcs. WDR 100 236 810 044
16 tools*	_____ pcs. WDR 100 236 595 045	10 tools*	_____ pcs. WKT 050 118 810 045	10 tools*	_____ pcs. WWR 100 118 810 045	20 tools*	_____ pcs. WDR 100 236 810 045
8 tools*	_____ pcs. WDR 100 236 595 046	6 tools*	_____ pcs. WKT 050 118 810 046	6 tools*	_____ pcs. WWR 100 118 810 046	12 tools*	_____ pcs. WDR 100 236 810 046
16 tools	_____ pcs. WDR 100 236 595 051	10 tools*	_____ pcs. WKT 050 118 810 051	10 tools	_____ pcs. WWR 100 118 810 051	20 tools	_____ pcs. WDR 100 236 810 051
16 tools	_____ pcs. WDR 100 236 595 052	10 tools*	_____ pcs. WKT 050 118 810 052	10 tools	_____ pcs. WWR 100 118 810 052	20 tools	_____ pcs. WDR 100 236 810 052
8 tools	_____ pcs. WDR 100 236 595 053	10 tools*	_____ pcs. WKT 050 118 810 053	6 tools	_____ pcs. WWR 100 118 810 053	12 tools	_____ pcs. WDR 100 236 810 053
16 tools	_____ pcs. WDR 100 236 595 061	10 tools*	_____ pcs. WKT 050 118 810 061	10 tools	_____ pcs. WWR 100 118 810 061	20 tools	_____ pcs. WDR 100 236 810 061
8 tools	_____ pcs. WDR 100 236 595 062	6 tools*	_____ pcs. WKT 050 118 810 062	6 tools	_____ pcs. WWR 100 118 810 062	12 tools	_____ pcs. WDR 100 236 810 062
16 tools	_____ pcs. WDR 100 236 595 071	10 tools*	_____ pcs. WKT 050 118 810 071	10 tools	_____ pcs. WWR 100 118 810 071	20 tools	_____ pcs. WDR 100 236 810 071
92,00		65,00		69,00		98,00	

* to be used only with attachments or heightening



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

The perfect system for the safe and well-arranged storage of all types of bending tools

The Apfel bending tool holders are precisely matched to the tooling of Trumpf press brakes to ensure the maximum of storage safety and material protection.

For a secure fit and problem-free handling the tool holders are sloped and equipped with dividers that can easily be adjusted without the use of any tools. Thanks to their special design they suit all Trumpf bending tools.

Arrange your individual tooling kits exactly according to your needs without compromising operating comfort, accessibility and safety at work.



compatible to
WSW trolleys



suits all Trumpf
bending tools



adjustable
dividers

Also
available for
Wilson Tool,
Salvagnini,
Amada etc.

Compatible equipment for maximum safety at work



WSW 583

Due to the inwardly slanted shelves with middle partition for a safe transport of bending tools and the integrated drawer that protects your measuring devices from dust, the WSW workshop trolley perfectly complements your press brake.

With a robust drawer, mountable on both sides, a handlebar of stainless steel, 2 swivel and 2 fixed castors and a total payload of 400 kg, the Apfel trolley WSW amounts to the essential mobile aid in your production.

tool holders for crosswise storage of lower bending tools in the LTL 1260



9 x
1.25 m
bending tools
=
11.25 m

Sound holders of galvanised steel with slot grids and tool-free adjustable dividers guarantee a secure fit and easy access

tool holders for lengthwise storage of lower bending tools in the LTL 1260

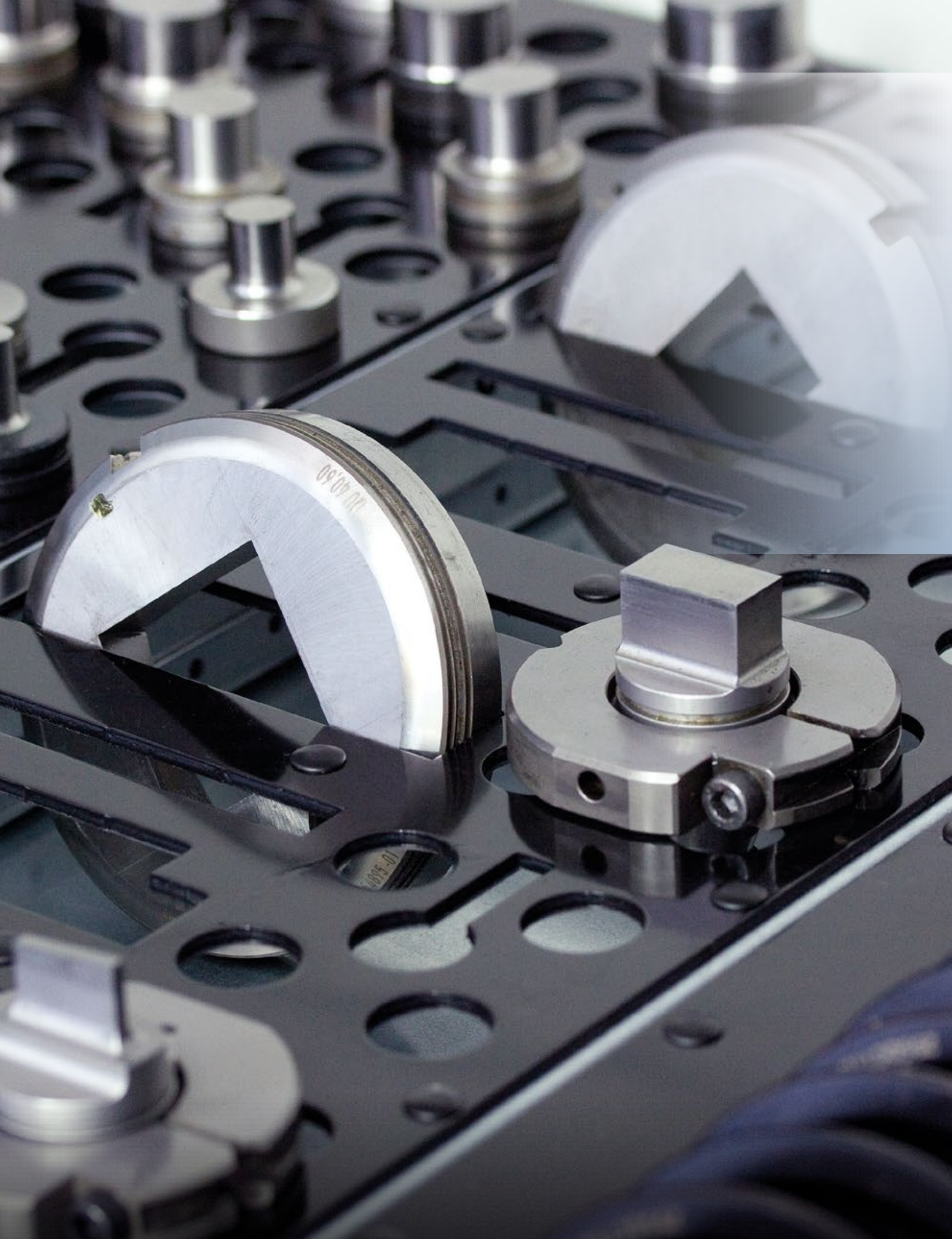


18 x
0.6 m
bending tools
=
10.8 m

To match more special applications we additionally offer tool holders with tool-free adjustable dividers for the lengthwise storage of all lower Trumpf bending tools.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



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For any request or order you are welcome to send us a photo via your smartphone.

The perfect system for the professional, safe and space-saving storage of all types of punching tools and setup cartridges

Our tool holders are optimally matched to the tooling of Trumpf punching machines to ensure safe storage with ultimate material protection.

Specially designed and accurately machined, our removable holders with tool-protecting plastic cover plate store all types of tools such as punches, reception rings, dies and strippers in the most safe and space-saving way.

The different tool holders of equal exterior dimensions can be combined, interchanged and even positioned in crosswise or lengthwise direction inside of the tray.



compatible to WSW trolleys



removable tool carrier



for lengthwise and crosswise positioning

Also available for Wilson Tool, Salvagnini, Amada etc.

The complete equipment for maximum use of space



WSW 581

On the sloped tool retainers with integrated oil binding felt inlay the WSW transports up to 45 setup cartridges cleanly and safely to and from your punching machine.

With a robust drawer, mountable from both sides, a stainless steel handlebar, 2 swivel and 2 guided castors and a total payload of 400 kg, the Apfel trolley WSW amounts to the essential mobile aid in your production.

tool carriers for the storage of Trumpf setup cartridges in the LTL 1260



The sloped tool holders with oil binding felt inlay for the well-arranged and clean storage of up to 24 unequipped or equipped setup cartridges per tray.

3 x 8 setup cartridges = 24 pcs.

unequipped tray for the storage of semi-finished blanks in the LTL 1260



Store up to 500 kg of semi-finished blanks



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

Ultimate use of space and and perfectly customized storage arrangement

standard heights:

100 mm	▲
75 mm	▲
50 mm	▲



box with
bottom



folded and
deburred edges



removable
box



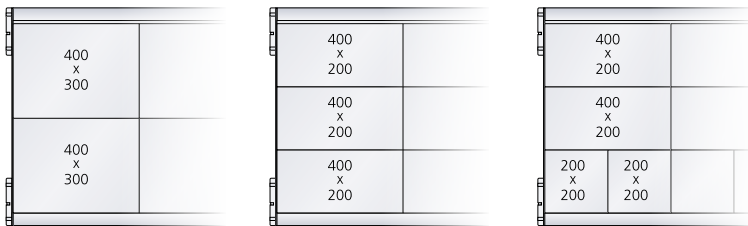
minimum
loss of space



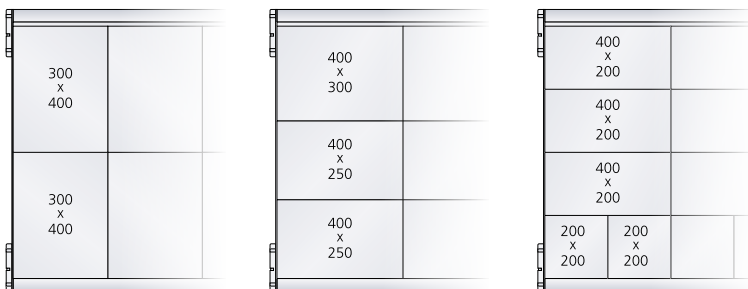
compatible to
WSW trolleys



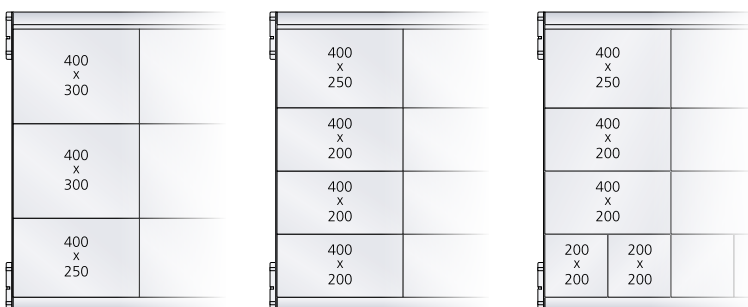
optimum fire
protection



Example configurations of trays with 610 mm depth



Example configurations of trays with 813 mm depth



Example configurations of trays with 864 mm depth

Metal storage boxes for the individual partition of your trays

With the precisely bended metal storage boxes you organize your tool tower to the smallest detail.

Whether made of lightweight aluminium or sturdy steel, thanks to their low material thickness, Apfel storage boxes keep the loss of space to a minimum.

Together with its content, each single box can individually be removed or interchanged.

According the required filling volume, all boxes are available in standard heights of 50, 75 und 100 mm.

Due to the all-metal construction they also meet the requirements of the fire protection regulations.



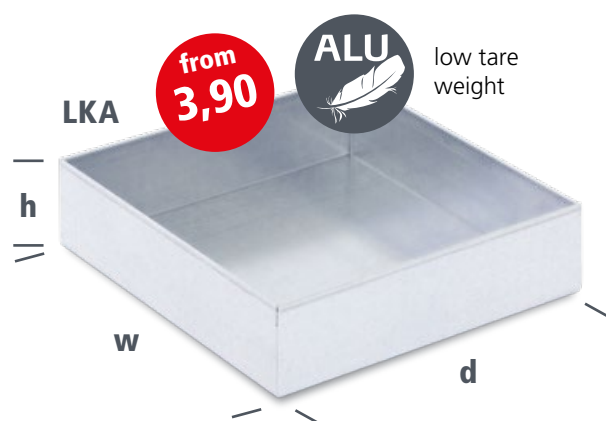
For the avoidance of injuries the edges of all Apfel metal storage boxes are folded and deburred



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

Storage boxes made of aluminium alloy for less tare weight and more payload

Compared to steel, Aluminium sheet (AlMg1) weighs just one-third of it. The use of light alloy material saves tare weight to effectively gain the payload capacity for the storage of your goods.



	100 mm d	150 mm d	200 mm d	250 mm d	300 mm d	350 mm d	400 mm d
Aluminium storage boxes of 50 mm height							
100 mm w	_____ pcs. LKA 050 100 100 110	_____ pcs. LKA 050 100 150 110	_____ pcs. LKA 050 100 200 110	_____ pcs. LKA 050 100 250 110	_____ pcs. LKA 050 100 300 110	_____ pcs. LKA 050 100 350 110	_____ pcs. LKA 050 100 400 110
150 mm w	_____ pcs. LKA 050 150 100 110	_____ pcs. LKA 050 150 150 110	_____ pcs. LKA 050 150 200 110	_____ pcs. LKA 050 150 250 110	_____ pcs. LKA 050 150 300 110	_____ pcs. LKA 050 150 350 110	_____ pcs. LKA 050 150 400 110
200 mm w	_____ pcs. LKA 050 200 100 110	_____ pcs. LKA 050 200 150 110	_____ pcs. LKA 050 200 200 110	_____ pcs. LKA 050 200 250 110	_____ pcs. LKA 050 200 300 110	_____ pcs. LKA 050 200 350 110	_____ pcs. LKA 050 200 400 110
250 mm w	_____ pcs. LKA 050 250 100 110	_____ pcs. LKA 050 250 150 110	_____ pcs. LKA 050 250 200 110	_____ pcs. LKA 050 250 250 110	_____ pcs. LKA 050 250 300 110	_____ pcs. LKA 050 250 350 110	_____ pcs. LKA 050 250 400 110
300 mm w	_____ pcs. LKA 050 300 100 110	_____ pcs. LKA 050 300 150 110	_____ pcs. LKA 050 300 200 110	_____ pcs. LKA 050 300 250 110	_____ pcs. LKA 050 300 300 110	_____ pcs. LKA 050 300 350 110	_____ pcs. LKA 050 300 400 110
350 mm w	_____ pcs. LKA 050 350 100 110	_____ pcs. LKA 050 350 150 110	_____ pcs. LKA 050 350 200 110	_____ pcs. LKA 050 350 250 110	_____ pcs. LKA 050 350 300 110	-	-
400 mm w	_____ pcs. LKA 050 400 100 110	_____ pcs. LKA 050 400 150 110	_____ pcs. LKA 050 400 200 110	_____ pcs. LKA 050 400 250 110	_____ pcs. LKA 050 400 300 110	-	-
Aluminium storage boxes of 75 mm height							
100 mm w	_____ pcs. LKA 075 100 100 110	_____ pcs. LKA 075 100 150 110	_____ pcs. LKA 075 100 200 110	_____ pcs. LKA 075 100 250 110	_____ pcs. LKA 075 100 300 110	_____ pcs. LKA 075 100 350 110	_____ pcs. LKA 075 100 400 110
150 mm w	_____ pcs. LKA 075 150 100 110	_____ pcs. LKA 075 150 150 110	_____ pcs. LKA 075 150 200 110	_____ pcs. LKA 075 150 250 110	_____ pcs. LKA 075 150 300 110	_____ pcs. LKA 075 150 350 110	_____ pcs. LKA 075 150 400 110
200 mm w	_____ pcs. LKA 075 200 100 110	_____ pcs. LKA 075 200 150 110	_____ pcs. LKA 075 200 200 110	_____ pcs. LKA 075 200 250 110	_____ pcs. LKA 075 200 300 110	_____ pcs. LKA 075 200 350 110	_____ pcs. LKA 075 200 400 110
250 mm w	_____ pcs. LKA 075 250 100 110	_____ pcs. LKA 075 250 150 110	_____ pcs. LKA 075 250 200 110	_____ pcs. LKA 075 250 250 110	_____ pcs. LKA 075 250 300 110	_____ pcs. LKA 075 250 350 110	_____ pcs. LKA 075 250 400 110
300 mm w	_____ pcs. LKA 075 300 100 110	_____ pcs. LKA 075 300 150 110	_____ pcs. LKA 075 300 200 110	_____ pcs. LKA 075 300 250 110	_____ pcs. LKA 075 300 300 110	_____ pcs. LKA 075 300 350 110	_____ pcs. LKA 075 300 400 110
350 mm w	_____ pcs. LKA 075 350 100 110	_____ pcs. LKA 075 350 150 110	_____ pcs. LKA 075 350 200 110	_____ pcs. LKA 075 350 250 110	_____ pcs. LKA 075 350 300 110	-	-
400 mm w	_____ pcs. LKA 075 400 100 110	_____ pcs. LKA 075 400 150 110	_____ pcs. LKA 075 400 200 110	_____ pcs. LKA 075 400 250 110	_____ pcs. LKA 075 400 300 110	-	-
Aluminium storage boxes of 100 mm height							
100 mm w	_____ pcs. LKA 100 100 100 110	_____ pcs. LKA 100 100 150 110	_____ pcs. LKA 100 100 200 110	_____ pcs. LKA 100 100 250 110	_____ pcs. LKA 100 100 300 110	_____ pcs. LKA 100 100 350 110	_____ pcs. LKA 100 100 400 110
150 mm w	_____ pcs. LKA 100 150 100 110	_____ pcs. LKA 100 150 150 110	_____ pcs. LKA 100 150 200 110	_____ pcs. LKA 100 150 250 110	_____ pcs. LKA 100 150 300 110	_____ pcs. LKA 100 150 350 110	_____ pcs. LKA 100 150 400 110
200 mm w	_____ pcs. LKA 100 200 100 110	_____ pcs. LKA 100 200 150 110	_____ pcs. LKA 100 200 200 110	_____ pcs. LKA 100 200 250 110	_____ pcs. LKA 100 200 300 110	_____ pcs. LKA 100 200 350 110	_____ pcs. LKA 100 200 400 110
250 mm w	_____ pcs. LKA 100 250 100 110	_____ pcs. LKA 100 250 150 110	_____ pcs. LKA 100 250 200 110	_____ pcs. LKA 100 250 250 110	_____ pcs. LKA 100 250 300 110	_____ pcs. LKA 100 250 350 110	_____ pcs. LKA 100 250 400 110
300 mm w	_____ pcs. LKA 100 300 100 110	_____ pcs. LKA 100 300 150 110	_____ pcs. LKA 100 300 200 110	_____ pcs. LKA 100 300 250 110	_____ pcs. LKA 100 300 300 110	_____ pcs. LKA 100 300 350 110	_____ pcs. LKA 100 300 400 110
350 mm w	_____ pcs. LKA 100 350 100 110	_____ pcs. LKA 100 350 150 110	_____ pcs. LKA 100 350 200 110	_____ pcs. LKA 100 350 250 110	_____ pcs. LKA 100 350 300 110	-	-
400 mm w	_____ pcs. LKA 100 400 100 110	_____ pcs. LKA 100 400 150 110	_____ pcs. LKA 100 400 200 110	_____ pcs. LKA 100 400 250 110	_____ pcs. LKA 100 400 300 110	-	-



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

Storage boxes made of galvanized steel for minimum loss of space and maximum storage volume

LKV

from
2,80minimum
loss of space

Our precisely bended boxes of galvanized steel require only a fraction of the material thickness needed by plastic containers. Therefore they offer maximum storage space to utilize the full capacity of your trays.

	100 mm d	150 mm d	200 mm d	250 mm d	300 mm d	350 mm d	400 mm d
Galvanized steel storage boxes of 50 mm height							
100 mm w	_____ pcs. LKV 050 100 100 110	_____ pcs. LKV 050 100 150 110	_____ pcs. LKV 050 100 200 110	_____ pcs. LKV 050 100 250 110	_____ pcs. LKV 050 100 300 110	_____ pcs. LKV 050 100 350 110	_____ pcs. LKV 050 100 400 110
150 mm w	_____ pcs. LKV 050 150 100 110	_____ pcs. LKV 050 150 150 110	_____ pcs. LKV 050 150 200 110	_____ pcs. LKV 050 150 250 110	_____ pcs. LKV 050 150 300 110	_____ pcs. LKV 050 150 350 110	_____ pcs. LKV 050 150 400 110
200 mm w	_____ pcs. LKV 050 200 100 110	_____ pcs. LKV 050 200 150 110	_____ pcs. LKV 050 200 200 110	_____ pcs. LKV 050 200 250 110	_____ pcs. LKV 050 200 300 110	_____ pcs. LKV 050 200 350 110	_____ pcs. LKV 050 200 400 110
250 mm w	_____ pcs. LKV 050 250 100 110	_____ pcs. LKV 050 250 150 110	_____ pcs. LKV 050 250 200 110	_____ pcs. LKV 050 250 250 110	_____ pcs. LKV 050 250 300 110	_____ pcs. LKV 050 250 350 110	_____ pcs. LKV 050 250 400 110
300 mm w	_____ pcs. LKV 050 300 100 110	_____ pcs. LKV 050 300 150 110	_____ pcs. LKV 050 300 200 110	_____ pcs. LKV 050 300 250 110	_____ pcs. LKV 050 300 300 110	_____ pcs. LKV 050 300 350 110	_____ pcs. LKV 050 300 400 110
350 mm w	_____ pcs. LKV 050 350 100 110	_____ pcs. LKV 050 350 150 110	_____ pcs. LKV 050 350 200 110	_____ pcs. LKV 050 350 250 110	_____ pcs. LKV 050 350 300 110	-	-
400 mm w	_____ pcs. LKV 050 400 100 110	_____ pcs. LKV 050 400 150 110	_____ pcs. LKV 050 400 200 110	_____ pcs. LKV 050 400 250 110	_____ pcs. LKV 050 400 300 110	-	-
Galvanized steel storage boxes of 75 mm height							
100 mm w	_____ pcs. LKV 075 100 100 110	_____ pcs. LKV 075 100 150 110	_____ pcs. LKV 075 100 200 110	_____ pcs. LKV 075 100 250 110	_____ pcs. LKV 075 100 300 110	_____ pcs. LKV 075 100 350 110	_____ pcs. LKV 075 100 400 110
150 mm w	_____ pcs. LKV 075 150 100 110	_____ pcs. LKV 075 150 150 110	_____ pcs. LKV 075 150 200 110	_____ pcs. LKV 075 150 250 110	_____ pcs. LKV 075 150 300 110	_____ pcs. LKV 075 150 350 110	_____ pcs. LKV 075 150 400 110
200 mm w	_____ pcs. LKV 075 200 100 110	_____ pcs. LKV 075 200 150 110	_____ pcs. LKV 075 200 200 110	_____ pcs. LKV 075 200 250 110	_____ pcs. LKV 075 200 300 110	_____ pcs. LKV 075 200 350 110	_____ pcs. LKV 075 200 400 110
250 mm w	_____ pcs. LKV 075 250 100 110	_____ pcs. LKV 075 250 150 110	_____ pcs. LKV 075 250 200 110	_____ pcs. LKV 075 250 250 110	_____ pcs. LKV 075 250 300 110	_____ pcs. LKV 075 250 350 110	_____ pcs. LKV 075 250 400 110
300 mm w	_____ pcs. LKV 075 300 100 110	_____ pcs. LKV 075 300 150 110	_____ pcs. LKV 075 300 200 110	_____ pcs. LKV 075 300 250 110	_____ pcs. LKV 075 300 300 110	_____ pcs. LKV 075 300 350 110	_____ pcs. LKV 075 300 400 110
350 mm w	_____ pcs. LKV 075 350 100 110	_____ pcs. LKV 075 350 150 110	_____ pcs. LKV 075 350 200 110	_____ pcs. LKV 075 350 250 110	_____ pcs. LKV 075 350 300 110	-	-
400 mm w	_____ pcs. LKV 075 400 100 110	_____ pcs. LKV 075 400 150 110	_____ pcs. LKV 075 400 200 110	_____ pcs. LKV 075 400 250 110	_____ pcs. LKV 075 400 300 110	-	-
Aluminium storage boxes of 100 mm height							
100 mm w	_____ pcs. LKV 100 100 100 110	_____ pcs. LKV 100 100 150 110	_____ pcs. LKV 100 100 200 110	_____ pcs. LKV 100 100 250 110	_____ pcs. LKV 100 100 300 110	_____ pcs. LKV 100 100 350 110	_____ pcs. LKV 100 100 400 110
150 mm w	_____ pcs. LKV 100 150 100 110	_____ pcs. LKV 100 150 150 110	_____ pcs. LKV 100 150 200 110	_____ pcs. LKV 100 150 250 110	_____ pcs. LKV 100 150 300 110	_____ pcs. LKV 100 150 350 110	_____ pcs. LKV 100 150 400 110
200 mm w	_____ pcs. LKV 100 200 100 110	_____ pcs. LKV 100 200 150 110	_____ pcs. LKV 100 200 200 110	_____ pcs. LKV 100 200 250 110	_____ pcs. LKV 100 200 300 110	_____ pcs. LKV 100 200 350 110	_____ pcs. LKV 100 200 400 110
250 mm w	_____ pcs. LKV 100 250 100 110	_____ pcs. LKV 100 250 150 110	_____ pcs. LKV 100 250 200 110	_____ pcs. LKV 100 250 250 110	_____ pcs. LKV 100 250 300 110	_____ pcs. LKV 100 250 350 110	_____ pcs. LKV 100 250 400 110
300 mm w	_____ pcs. LKV 100 300 100 110	_____ pcs. LKV 100 300 150 110	_____ pcs. LKV 100 300 200 110	_____ pcs. LKV 100 300 250 110	_____ pcs. LKV 100 300 300 110	_____ pcs. LKV 100 300 350 110	_____ pcs. LKV 100 300 400 110
350 mm w	_____ pcs. LKV 100 350 100 110	_____ pcs. LKV 100 350 150 110	_____ pcs. LKV 100 350 200 110	_____ pcs. LKV 100 350 250 110	_____ pcs. LKV 100 350 300 110	-	-
400 mm w	_____ pcs. LKV 100 400 100 110	_____ pcs. LKV 100 400 150 110	_____ pcs. LKV 100 400 200 110	_____ pcs. LKV 100 400 250 110	_____ pcs. LKV 100 400 300 110	-	-



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

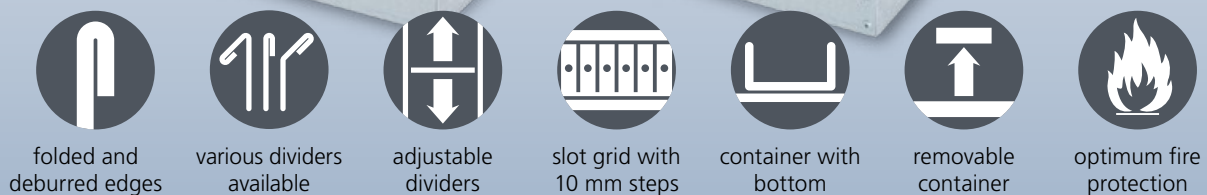
SWV – enclosed slot grid containers with dividable compartments

For the avoidance of injuries
all external edges are folded

standard heights:

125 mm	▲
100 mm	▲
75 mm	▲
50 mm	▲

from
18,50



compatible to
WSW trolleys

Removable slot grid containers with tool-free adjustable dividers for the customizable storage of various kinds of articles

Wherever your storage items have to be transported to and from a workplace, the removable slot grid containers provide the optimum solution.

Thanks to its high rigidity, the enclosed container with integrated bottom offers high payload and safe removal.

To prevent injury, the external edges of the galvanized steel components are folded.

For the fast and individual partition, the crosswise dividers are snapped into the lengthwise inserted slot grid with 10 mm increments without the use of any tools.

To precisely match your storage needs, the containers are available in widths from 150 to 400 mm.

Due to the all-metal construction, the containers meet the requirements of fire protection regulations.



also available
in aluminium



For a quick and easy application of barcode labels or magnetic stickers, all dividers are sloped and to avoid injuries, folded on all external edges.



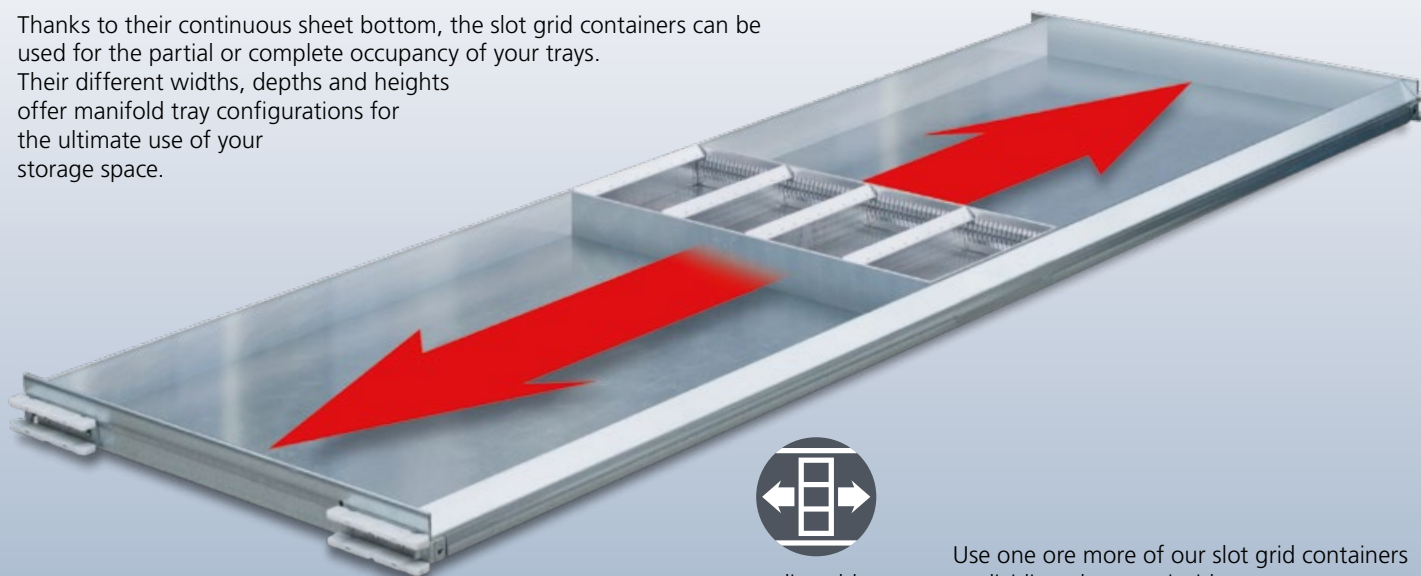
Without the use of any tools the dividers can be positioned individually within the 10 mm slot grid in which the precise machining guarantees a secure fit.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

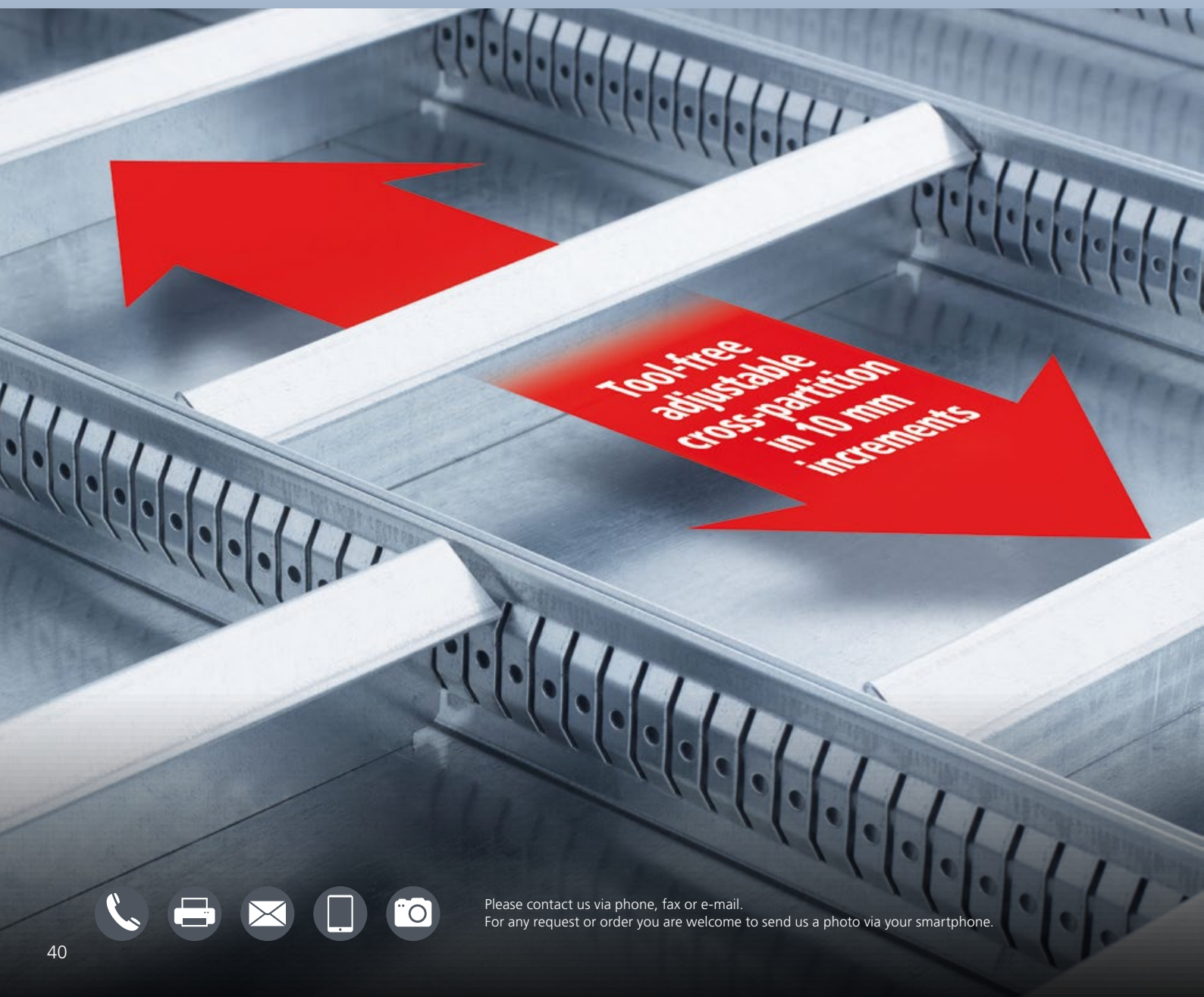
Subdivide your trays with slot grid containers

Thanks to their continuous sheet bottom, the slot grid containers can be used for the partial or complete occupancy of your trays. Their different widths, depths and heights offer manifold tray configurations for the ultimate use of your storage space.



adjustable
positioning

Use one or more of our slot grid containers as dividing elements inside your trays to partition your individual storage spaces.



Tool-free
adjustable
cross-partition
in 10 mm
increments



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

Removable slot grid containers – individually dividable storage places in an enclosed full-metal housing

	300 mm d	400 mm d	600 mm d	800 mm d	dividers
Slot grid containers of 50 mm height					
150 mm w	_____ pcs. SWV 050 150 300 210	_____ pcs. SWV 050 150 400 210	_____ pcs. SWV 050 150 600 210	_____ pcs. SWV 050 150 800 210	_____ pcs.
200 mm w	_____ pcs. SWV 050 200 300 210	_____ pcs. SWV 050 200 400 210	_____ pcs. SWV 050 200 600 210	_____ pcs. SWV 050 200 800 210	_____ pcs.
250 mm w	_____ pcs. SWV 050 250 300 210	_____ pcs. SWV 050 250 400 210	_____ pcs. SWV 050 250 600 210	_____ pcs. SWV 050 250 800 210	_____ pcs.
300 mm w	_____ pcs. SWV 050 300 300 210	_____ pcs. SWV 050 300 400 210	_____ pcs. SWV 050 300 600 210	_____ pcs. SWV 050 300 800 210	_____ pcs.
350 mm w	_____ pcs. SWV 050 350 300 210	_____ pcs. SWV 050 350 400 210	_____ pcs. SWV 050 350 600 210	_____ pcs. SWV 050 350 800 210	_____ pcs.
400 mm w	_____ pcs. SWV 050 400 300 210	_____ pcs. SWV 050 400 400 210	_____ pcs. SWV 050 400 600 210	_____ pcs. SWV 050 400 800 210	_____ pcs.

Slot grid containers of 75 mm height					
150 mm w	_____ pcs. SWV 075 150 300 210	_____ pcs. SWV 075 150 400 210	_____ pcs. SWV 075 150 600 210	_____ pcs. SWV 075 150 800 210	_____ pcs.
200 mm w	_____ pcs. SWV 075 200 300 210	_____ pcs. SWV 075 200 400 210	_____ pcs. SWV 075 200 600 210	_____ pcs. SWV 075 200 800 210	_____ pcs.
250 mm w	_____ pcs. SWV 075 250 300 210	_____ pcs. SWV 075 250 400 210	_____ pcs. SWV 075 250 600 210	_____ pcs. SWV 075 250 800 210	_____ pcs.
300 mm w	_____ pcs. SWV 075 300 300 210	_____ pcs. SWV 075 300 400 210	_____ pcs. SWV 075 300 600 210	_____ pcs. SWV 075 300 800 210	_____ pcs.
350 mm w	_____ pcs. SWV 075 350 300 210	_____ pcs. SWV 075 350 400 210	_____ pcs. SWV 075 350 600 210	_____ pcs. SWV 075 350 800 210	_____ pcs.
400 mm w	_____ pcs. SWV 075 400 300 210	_____ pcs. SWV 075 400 400 210	_____ pcs. SWV 075 400 600 210	_____ pcs. SWV 075 400 800 210	_____ pcs.

Slot grid containers of 100 mm height					
150 mm w	_____ pcs. SWV 100 150 300 210	_____ pcs. SWV 100 150 400 210	_____ pcs. SWV 100 150 600 210	_____ pcs. SWV 100 150 800 210	_____ pcs.
200 mm w	_____ pcs. SWV 100 200 300 210	_____ pcs. SWV 100 200 400 210	_____ pcs. SWV 100 200 600 210	_____ pcs. SWV 100 200 800 210	_____ pcs.
250 mm w	_____ pcs. SWV 100 250 300 210	_____ pcs. SWV 100 250 400 210	_____ pcs. SWV 100 250 600 210	_____ pcs. SWV 100 250 800 210	_____ pcs.
300 mm w	_____ pcs. SWV 100 300 300 210	_____ pcs. SWV 100 300 400 210	_____ pcs. SWV 100 300 600 210	_____ pcs. SWV 100 300 800 210	_____ pcs.
350 mm w	_____ pcs. SWV 100 350 300 210	_____ pcs. SWV 100 350 400 210	_____ pcs. SWV 100 350 600 210	_____ pcs. SWV 100 350 800 210	_____ pcs.
400 mm w	_____ pcs. SWV 100 400 300 210	_____ pcs. SWV 100 400 400 210	_____ pcs. SWV 100 400 600 210	_____ pcs. SWV 100 400 800 210	_____ pcs.

Slot grid containers of 125 mm height					
150 mm w	_____ pcs. SWV 125 150 300 210	_____ pcs. SWV 125 150 400 210	_____ pcs. SWV 125 150 600 210	_____ pcs. SWV 125 150 800 210	_____ pcs.
200 mm w	_____ pcs. SWV 125 200 300 210	_____ pcs. SWV 125 200 400 210	_____ pcs. SWV 125 200 600 210	_____ pcs. SWV 125 200 800 210	_____ pcs.
250 mm w	_____ pcs. SWV 125 250 300 210	_____ pcs. SWV 125 250 400 210	_____ pcs. SWV 125 250 600 210	_____ pcs. SWV 125 250 800 210	_____ pcs.
300 mm w	_____ pcs. SWV 125 300 300 210	_____ pcs. SWV 125 300 400 210	_____ pcs. SWV 125 300 600 210	_____ pcs. SWV 125 300 800 210	_____ pcs.
350 mm w	_____ pcs. SWV 125 350 300 210	_____ pcs. SWV 125 350 400 210	_____ pcs. SWV 125 350 600 210	_____ pcs. SWV 125 350 800 210	_____ pcs.
400 mm w	_____ pcs. SWV 125 400 300 210	_____ pcs. SWV 125 400 400 210	_____ pcs. SWV 125 400 600 210	_____ pcs. SWV 125 400 800 210	_____ pcs.

Available widths:

150 mm

200 mm

250 mm

300 mm

350 mm

400 mm

Slot grid containers are available in widths of 150, 200, 250, 300, 350 and 400 mm, covering the half-depth (300 or 400 mm) or the full-depth (600 or 800 mm) of the tray.

According to the required filling volume, all containers are available in our standard heights of 50, 75, 100 and 125 mm.



Useful magnetic labeling strips (c-profile) for the individual tagging of your storage goods, incl. insertable cardboard label and protective foil, approx. 100 mm w x 20 mm h.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

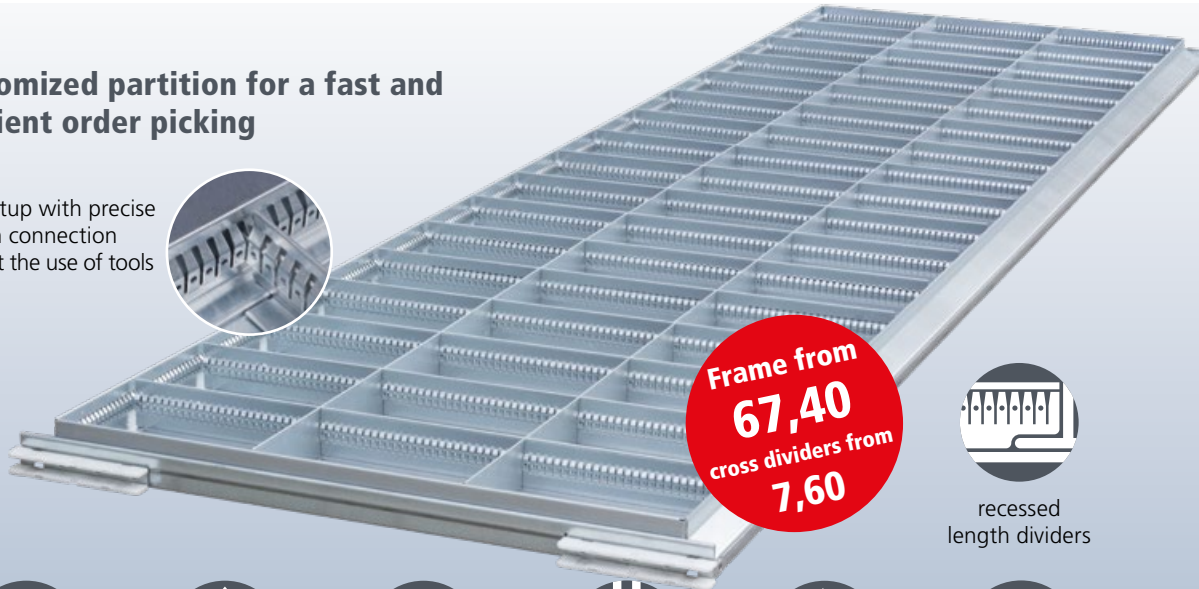
Customized partition for a fast and efficient order picking

easy setup with precise
snap-in connection
without the use of tools



standard heights:

100 mm	▲
75 mm	▲
50 mm	▲



Frame from
67,40
cross dividers from
7,60



recessed
length dividers



folded and
deburred edges



various dividers
available



adjustable
dividers



tapered slot grid
of 10 mm steps



extra wide
base plate



optimum fire
protection



snap-in connection
without use of tools

Snap-fastened slot grid frames – the lightweight, adjustable and stable solution for your merchandise-driven storage

The newly developed slot grid containers come with plenty of technical features that make the subdivision of your trays not only simple and flexible, but also functional and safe.

All components are made of galvanized sheet steel and can be assembled without the use of any tools.

Due to the all-metal construction, they meet the requirements of fire protection regulations.

Reinforced corner joints with precisely finished edge bonds provide maximum stability and durability.

Recessed on both ends, the lengthwise dividers with their newly designed, high-strength snap-in connections additionally brace the frame to stabilize the whole construction against tension and compression.

Extra wide all-around base plates provide ultimate rigidity and a safe stand.



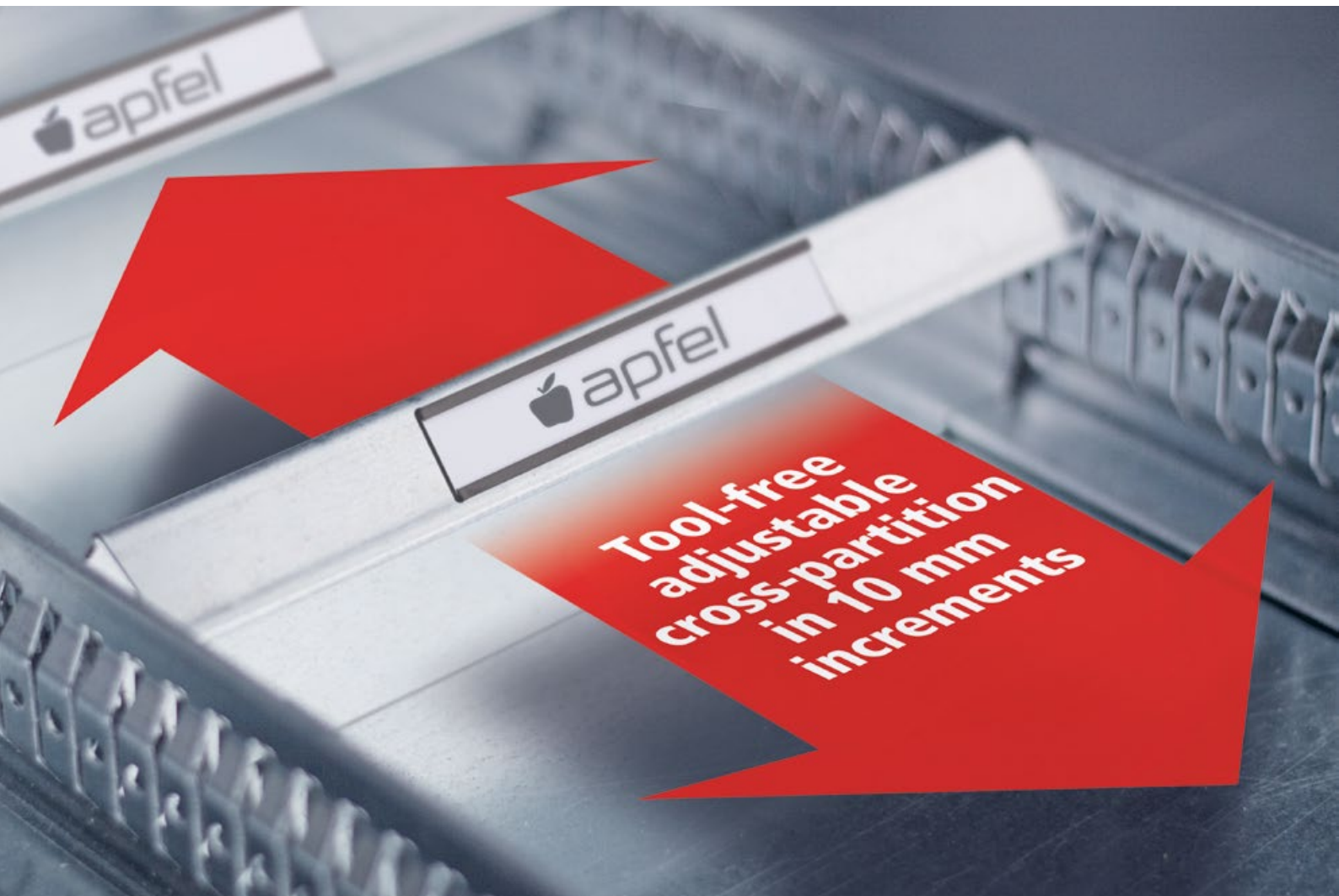
Sound corner joints provide highest rigidity and a precise fit. The recessed extra wide base plates additionally stabilize the whole frame structure.



To prevent injury, the external edges of all components are folded. For an individual tagging, different sloped dividers and magnetic labelling strips are available.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

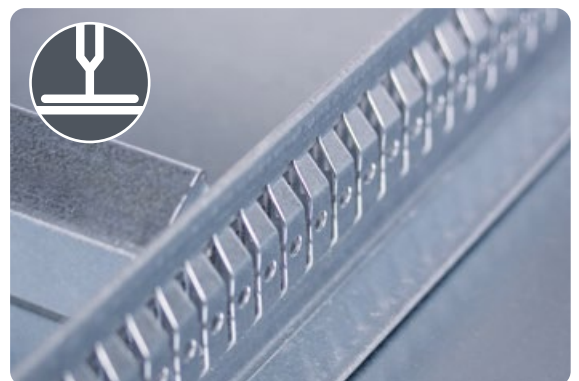


Snap-fastened slot grid frames for the quantity-oriented partition of your storage spaces

With our snap-fastened slot grid frames you build up efficient, weight-saving storage and order picking systems, always easily adaptable to the amount of items to be stored.



When the dividers are safely fixed into the tapered slots, they overlay the base plate of the outer frame due to their recessed ends to increase the rigidity and sturdiness of the whole construction.



The extra wide dimensioned base plates of the length dividers ensure a stable construction without tension and contorsion which sustains even the most heaviest loads.



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

Customized partition for a fast and efficient order picking



Tray with 12 storage compartments,
partitioned by 5 length and
6 crosswise dividers



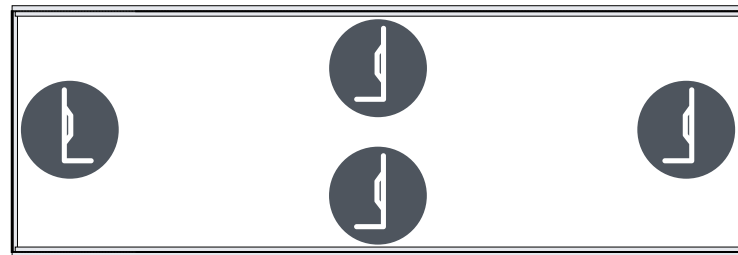
Tray with 16 storage compartments,
partitioned by 7 length and
8 crosswise dividers



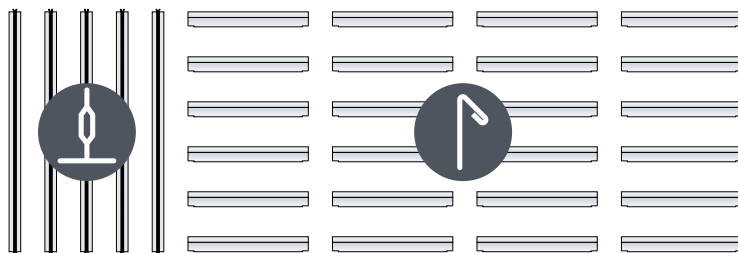
Tray with 20 storage compartments,
partitioned by 7 length and
12 crosswise dividers



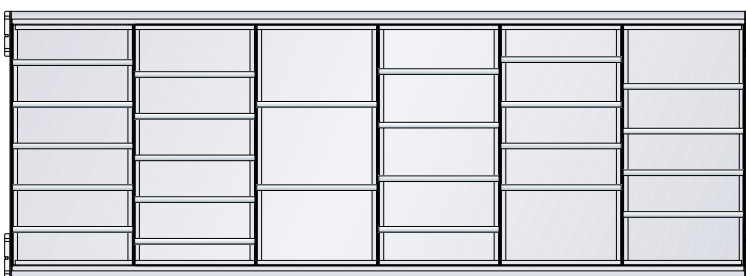
Unequipped tray



Frame with tapered slot grid of 10 mm increments



Length dividers with slot grid and sloped crosswise dividers



Tray with varying compartments, adjustable without the need of tools

Assembly of a slot grid frame in a tray

The mounting of the length dividers into the frame as well as the positioning of the crosswise dividers into the length dividers are implemented without the need of any tools.

To guarantee an easy plug in and a permanent fixation of the crosswise dividers, our new developed grid consists of tapered cut slots of 10 mm distance.

For a better perceptibility, the crosswise dividers are sloped and can be easily tagged by magnetic or adhesive labels.

To prevent injury, the external edges of the galvanized steel components are folded.

According to the required filling volume, all components are available in heights of 50, 75 and 100 mm.

Choose the components that suit your individual storage system from our extensive range.



The length dividers of galvanized steel with their double clamp are snapped into the tapered slots of the outer frame to build up a stable traction- and pressure-resistant connection.



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.



**Adjustable
cross-partition
fastened
in 10 mm
increments**

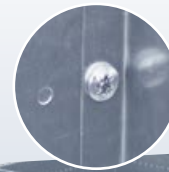


Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

Screw-fastened divider plate frames with big filling heights for a safe high-volume storage of large amounts of goods

standard heights:

250 mm
200 mm
150 mm



Screwed in dividers for the safe storage of large amounts of goods



hole grid with 10 mm steps



folded and deburred edges



various dividers available



suitable for suspension files



screwed in dividers

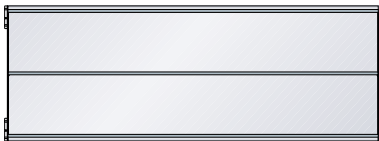


adjustable cross-partition



optimum fire protection

Example subdivisions of trays



2 storage compartments for extra long items, partitioned by 1 lengthwise divider



4 storage compartments, partitioned by 1 length divider and 2 crosswise dividers



6 storage compartments, partitioned by 2 length dividers and 3 crosswise dividers



8 storage compartments, partitioned by 3 length dividers and 4 crosswise dividers



12 storage compartments, partitioned by 5 length dividers and 6 crosswise dividers



16 storage compartments, partitioned by 7 length dividers and 8 crosswise dividers

Plenty of space for the well-arranged and safe storage of your goods

The sound frame with its screwed-in length and crosswise dividers provides maximum stability.

Due to the continuous hole grid of 10 mm increments the crosswise dividers are lengthwise adjustable.

For the storage of extra long items the tray can be completely divided lengthwise.

With two dividers next to each other the tray can even suit the storage of suspension files.

To prevent injury, the external edges of the galvanized steel components are folded.



Tray with sloped crosswise dividers for the application of magnetic or adhesive labels



Get all basic data such as weight, storage capacity, space occupancy, etc. calculated and edited through our configurator. We gladly arrange your individual tray layout for optimised utilisation and maximum efficiency.

KEK – the perfect bin sizes for storage according to the euro code

KEK 1510



KEK 2015



KEK 3020



KEK 4030

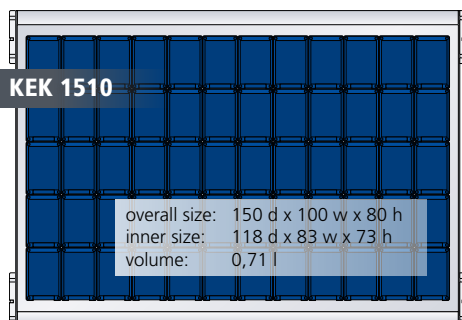


As well
available with
view panel or
dust cover

The KEK euro code plastic storage bins are perfectly compatible to euro pallet dimensions. The four different sizes are combinable with each other in width and length and therefore ideally suited for the equipment of tool tower trays.

Made of shock-proof polypropylene (PP) and equipped with tubular corners they are easily stackable and stand extreme weights (for example 650 kg superimposed load for the KEK 4030).

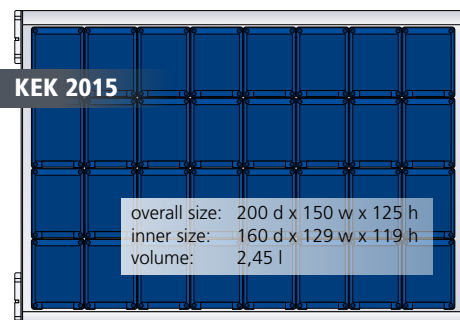
Example calculations with trays of the LTL 1280



3,000 mm h = 12 trays of 60 plastic bins of 150 x 100 mm
Total storage capacity: 720 euro code plastic bins

6,000 mm h = 32 trays of 60 plastic bins of 150 x 100 mm
Total storage capacity: 1.920 euro code plastic bins

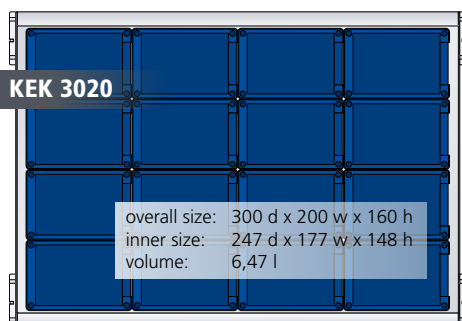
9,000 mm h = 52 trays of 60 plastic bins of 150 x 100 mm
Total storage capacity: 3.120 euro code plastic bins



3,000 mm h = 12 trays of 32 plastic bins of 200 x 150 mm
Total storage capacity: 384 euro code plastic bins

6,000 mm h = 32 trays of 32 plastic bins of 200 x 150 mm
Total storage capacity: 1.024 euro code plastic bins

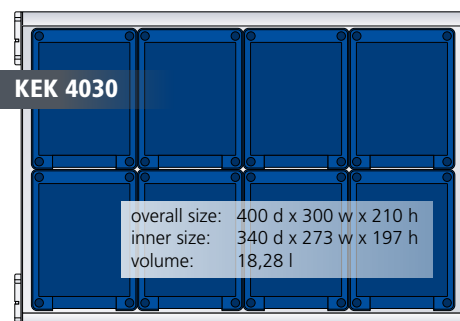
9,000 mm h = 52 trays of 32 plastic bins of 200 x 150 mm
Total storage capacity: 1.664 euro code plastic bins



3,000 mm h = 12 trays of 16 plastic bins of 300 x 200 mm
Total storage capacity: 192 euro code plastic bins

6,000 mm h = 32 trays of 16 plastic bins of 300 x 200 mm
Total storage capacity: 512 euro code plastic bins

9,000 mm h = 52 trays of 16 plastic bins of 300 x 200 mm
Total storage capacity: 832 euro code plastic bins



3,000 mm h = 12 trays of 8 plastic bins of 400 x 300 mm
Total storage capacity: 96 euro code plastic bins

6,000 mm h = 32 trays of 8 plastic bins of 400 x 300 mm
Total storage capacity: 256 euro code plastic bins

9,000 mm h = 52 trays of 8 plastic bins of 400 x 300 mm
Total storage capacity: 416 euro code plastic bins



Please contact us via phone, fax or e-mail.
For any request or order you are welcome to send us a photo via your smartphone.

LTK – customized tool tower solutions



Tray with transfer station and transport trolley for extremely heavy, shock-sensitive lathe chucks in the plant of an automobile manufacturer



Extensive tool warehouse with three towers of 12 meters height and customized widths in the interspace of two production halls

Installation of a warehouse for plastic injection molds and consumables with Apfel LTK tool tower solutions

With LTK tool towers of 12 meters height and customized widths as well as with special trays of 1,000 kg total payload, a professional storage system for the stockpiling of extremely heavy tools could be realized successfully.

In a rather narrow interspace, the tool towers in reinforced version created both a centrally located warehouse and a conveniently situated, covered passageway on the company premises.

Short distances, fast access times and the ergonomic working height now ensure a secure, highly efficient supply of a multitude of stored goods.

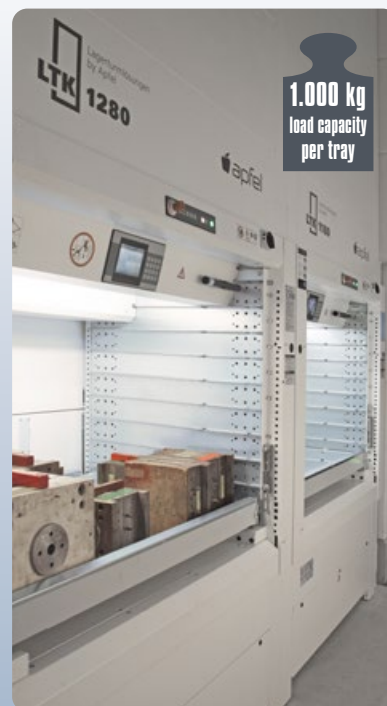


HFG *HENZEL Automotive GmbH*

With Apfel tool towers, we have installed our complete tool warehouse on a previously unused area between our moldmaking and production facilities.

The practical project planning, the straightforward realization and the reliable function of Apfel tool tower solutions fully convinced us.

Hermann Amberg, operating manager



LTK customized tool tower solutions: high-performance systems with ultimate benefits

With custom dimensions, specially designed trays, transfer stations and transport trolleys, LTK tool tower solutions offer far more than just the ordinary.

Whether it is the construction of a storage system for the operating supplies of a cable assembly company, the stockpiling of special tools of an automobile manufacturer or the pinpoint access to security related goods - with our custom-made tool tower solutions, we meet the highest standards in terms of sustainability, functionality and safety aspects.

Create a needs-oriented, intelligent storage system with maximum efficiency at minimum space requirements.



Tandem tool towers in ESD design with access openings on two floors



Tray with flap technology and light point indication for the controlled and error-free release of goods to ensure authorised access (available for all tray sizes)



Tray with transfer station and transport trolley for grinding wheels



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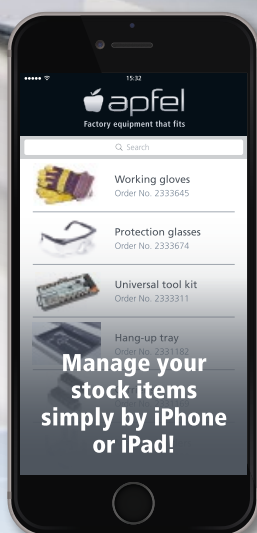
LTL Tool Tower Solutions by Apfel



Lagerwerkzeuge
by Apfel
LTL 1860



Optional photo
documentation



Industry 4.0 in a pants pocket

LTL tool towers with
optional management by
iPhone or iPad and online
documentation by the
integrated camera

Prices are quoted in Euro ex works. Transport and installation not included.
Dimensions in millimeters. Subject to change without notice.

 **apfel**
Factory equipment that fits

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