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# Introduction

Ever since 1992, Trilogiq has been advising and supporting manufacturing companies committed to Lean Manufacturing.

LeanTek® delivers the ideal way to implement this method effectively in every manufacturing environment.

Inherently innovative and subject to continual development, LeanTek® incorporates all the experience and requirements of its users.

Trilogiq also offers a range of local services ranging from a basic introduction to LeanTek® assembly through to courses in Lean Manufacturing.



# The Trilogiq Group



With its own engineering centre and in-house production resources, Trilogiq researches and designs its products in Europe and North America.

## France

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## In-house production

Efficient, automated production resources ensure that our products comply with ISO 9001.



# Global presence



# Direct presence

Trilogiq has a direct presence in 19 countries

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# Our customers

Some of the companies that have put their trust in us since 1992.

General Motors • Ford • Volkswagen • Daimler-Chrysler •  
Audi • Toyota • Renault • Nissan • Dacia • Peugeot-  
Citroën • Honda • Suzuki • BMW • Porsche • Aston-  
Martin • Jaguar • Volvo Trucks • Land Rover • Lotus •  
Continental • Delphi • Lear Corporation • Visteon •  
Toyoda-Gosei • Faurecia • Bosch • Siemens VDO •  
Denso • Textron • Valeo • Rieter Automotive • Claas •  
Johnson-Controls • Wagon • MGI-Coutier • Schneider •  
TRW • Airbus • Boeing • Embraer • Eurocopter •  
EADS • Aircelle France • Matra • Plastic-Omnium •  
Behr • Thomson • Saunier Duval • Electrolux • Whirlpool •  
Sony • Canon • Autoliv • KTM • Peguform • Hewlett-  
Packard • Areva • Alcatel • Siemens • NEC-Computer •  
Steelcase • SAFT • Solelectron • Beiersdorf • Getrag •  
ZF • Knorr-Bremse • Aprilia • BOS • M.B.L.E. •  
Oxford-Automotive • EPSON Omegal • Neyr • Lexmark •  
Hermès • Louis Vuitton • Lego • Renault Trucks



# Philosophy of Lean-Manufacturing



Whichever industry you work in, Lean-Manufacturing is the proven path to improved quality, lower costs and shorter delivery times.



# History

At the end of 1890, Frederick W Taylor became the first to study work management scientifically and distribute the results. His work led to the formalization of time and motion studies and the setting of common standards. Frank Gilbreth then added the concept of breaking work down into elementary time blocks. It was around this time that the first notions of eliminating waste and studying movement began to emerge. In 1910, Henry Ford invented the assembly line for his standardized Ford Model T. Alfred P. Sloan improved on Ford's system when he introduced the concept of assembly line diversity at GM.

After the Second World War, Taiichi Ohno and Shigeo Shingo created the "Just In Time", "Waste Reduction" and "Pull System" concepts for Toyota, which, together with other flow management techniques, resulted in the Toyota Production System (TPS).

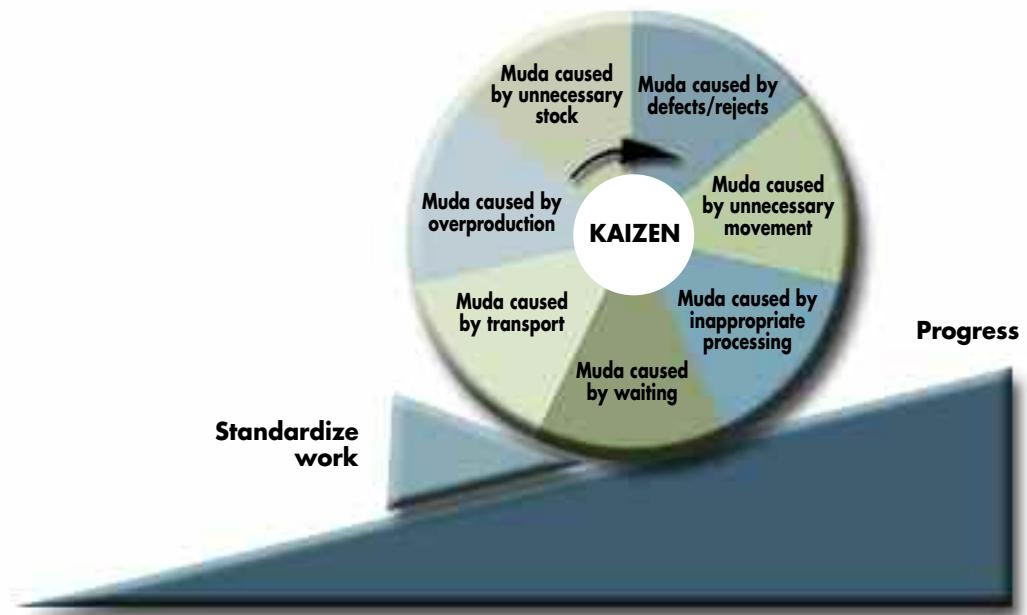
The TPS has been evolved and improved ever since. In 1990, James Womack summarized these concepts to create Lean Manufacturing at a time when Japanese expertise was spreading to the West and the success achieved by companies applying these principles and techniques became undeniable.

# The 7 mudas

**Lean Manufacturing identifies 7 areas of waste or «muda».**

The Lean Manufacturing house can only grow if its foundations are built first. Without using a highly flexible and modular system that allows muda to be eliminated and Kaizen attitudes to be introduced into the plant, it is impossible to proceed to the later

steps of Lean Manufacturing, which are work standardization, sequencing (Heijunka) JIT and JIDOKA. The systematic use of LeanTek® acts as a catalyst for the policy of waste reduction and as a tool for implementing the Kaizen attitudes of continuous improvement.



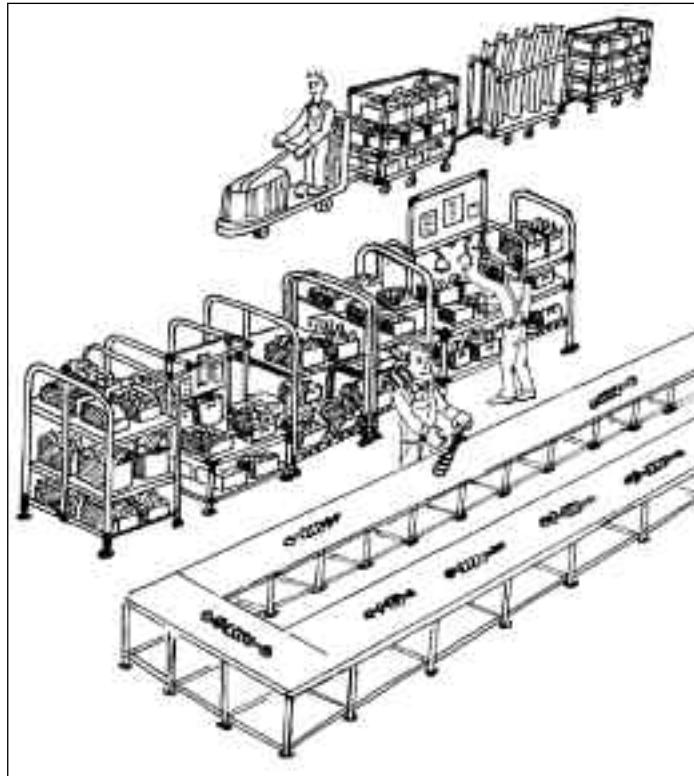
# Priority on line side productivity

Why give preference to line side productivity? The production line is the place where value is created, and it is also the place with the highest density of labour.

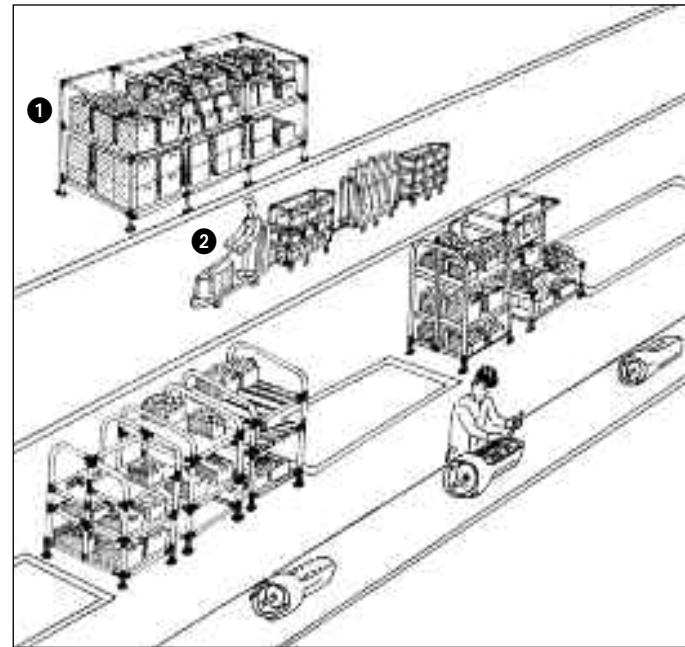
Finally, the assembly line is the most costly place in a factory in terms of production costs and investment.

Consequently priority must be given to line side productivity because this is where the added value is created.

One of the golden rules of Lean is that Mudas must be eliminated as much as possible from the point of added value, i.e. assembly points. We shall see for example how Mudas must be "moved" from the line to upstream processes, so that it can then be reduced...



# Principles of the new logistics: setting up flows



① Replacement of the pallet truck + large container mode with a shopstock/small box model: setting up modular JIT shopstocks as close as possible to the line.

② Supplying the line by small trains making frequent deliveries.

Main advantages of hand-portable containers in place of large containers: **improved logistics productivity**. Expensive-to-run lift trucks are replaced by small versatile trains circulating between shopstocks and the line sides. Small container flows are set up to shopstocks with LeanTek-type line side racks providing better rotation of circulating assets.

**The shopstock** (stock supply close to workstation) possibly including kit preparation. In some lean factories, the traditional shopstock has been brought to the immediate vicinity of the line side (generally a few metres) and modified in the preparation zone: "lean trains" are eliminated by line-shopstock proximity. This allows the use of "shooters" and hand-pushed trolleys for very tight JIT and total elimination of vehicle costs.

Before this practice can be introduced lean manufacturing and JIT tools must be mastered.

# The Kaizen attitude

**The Kaizen attitude is the company's driving force in the fight against muda.**

One of the first steps taken by the Lean Company is to introduce multidisciplinary teams (including operators) on the factory floor to help reduce waste. The Kaizen approach consists of making continual user-driven improvements

as part of the fight against muda.

The incomparable flexibility of LeanTek® and the ease with which anyone can use the system make it a vital part of implementing any Kaizen policy.

LeanTek® creativity delivers effective and practical tools for implementing a policy of continual change.



Personalized Kaizen line-side flow racks.

# LeanTek®: the Kaizen system

It is not simply by chance that companies setting up lean manufacturing have adopted the LeanTek® tool. This tool is quickly implemented and it is possible to get started and put the idea into application very easily and rapidly. The versatility of LeanTek® assists the introduction of the Kaizen continual improvement attitude.

On every continent, the tubular system is recognised as the ideal tool for successfully introducing any lean manufacturing policy.

# Lean-Manufacturing Objectives

## Quality

Increasing the quality level of the working process means reducing the number of errors, repairs and rejects. The result is less demand for company resources and therefore lower total operating costs.

## Cost

The production process begins with human resources, installations and raw materials and ends with finished products.

Productivity increases when the same amount of initial resources generate more finished products at the end of the process, or, conversely, when less initial resources are required to produce the same volume of finished products.

## Deadlines

### Reducing throughput

Throughput is the time that elapses between the company receiving its raw materials and receiving payment for the products produced using those raw materials.

Reducing this interval means being able to produce more products in the same time, better rotation of resources and the ability to react faster and more flexibly to satisfy customer needs.

## Cost

### Reducing inventory

Inventories eat up space, add considerably to logistics costs and consume significant amounts of financial assets; assets that could be better employed elsewhere.

Used in conjunction with small containers and supply trains, LeanTek® supermarkets located as closely as possible to the line and LeanTek® line-side flow racks give companies back the value destroyed by old stock management systems with their containers, pallets and forklift handling.



Supermarket application.

## Reducing space

Most companies use far too much space and more personnel than they need to:  
Lean Manufacturing using the LeanTek® system does away with unproductive conveyors,  
reduces production line length, incorporates previously separate workstations into the  
main line, reduces stocks and cuts logistics costs.  
All these improvements help reduce the need for space and offer the option of  
earmarking the regained space for future expansion.



# The main LeanTek® applications

The field of application for LeanTek® is infinite.

However, it is possible to identify 4 categories:

- Flow racks
- Trolleys and service trolleys
- Workstations
- Lean Manufacturing supermarkets

Kaizen

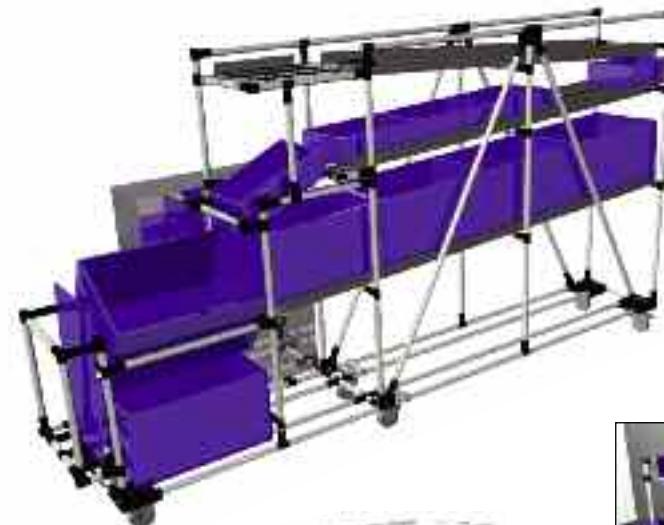


# Special flow racks

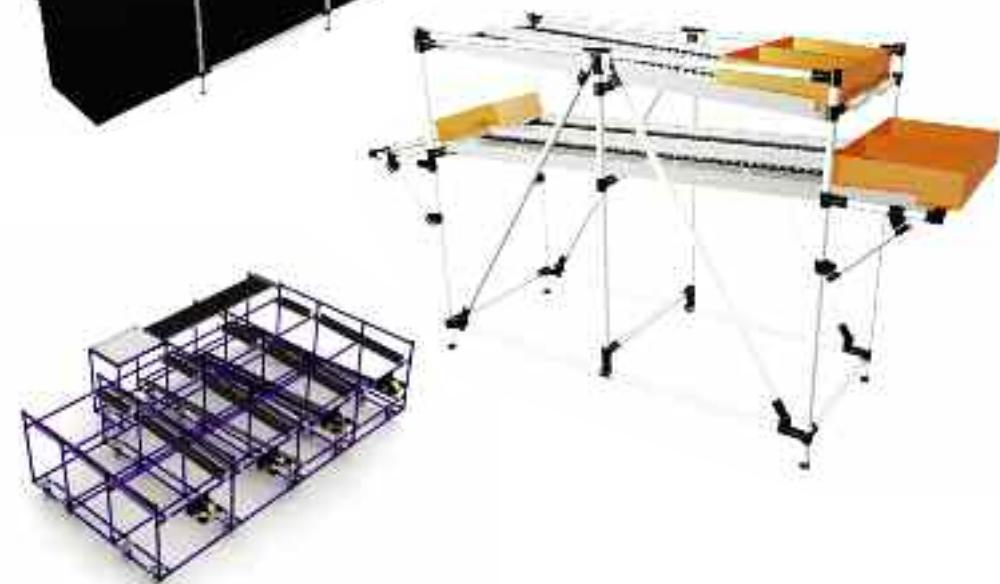


Customization is the essence of the Lean Manufacturing philosophy. LeanTek's special flow racks are produced by our design department as a direct response to your individual needs. Everything is configurable: length, width, height, structure, etc. The ergonomics and optional fittings are designed specifically for you, using all our expertise.





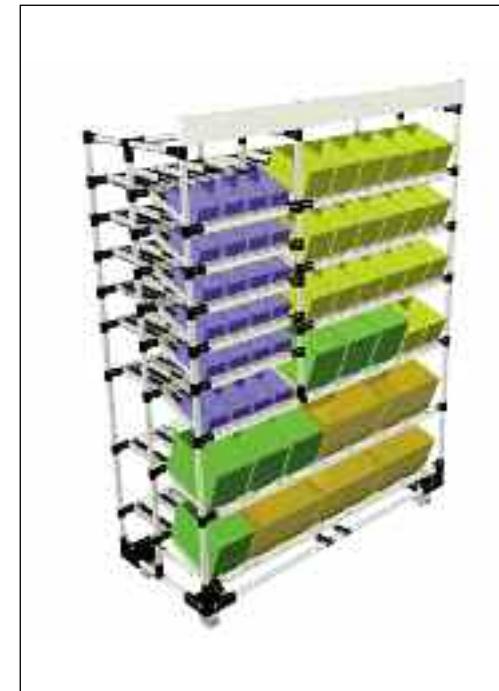
Lean manufacturing requires the elimination of large pieces of packing material at the side of the line. This change to smaller packaging is essential to the successful installation of a lean process. The advantage of small packages is their low weight, allowing the possibility of incorporating them into the flow and above all of transporting them at a lower cost.



# Trolleys



Trolleys are a natural application for LeanTek® and Lean Manufacturing. As components become increasingly complex, so the need for greater safety increases. Only a highly modular structure can respond to such demands without increasing design costs.



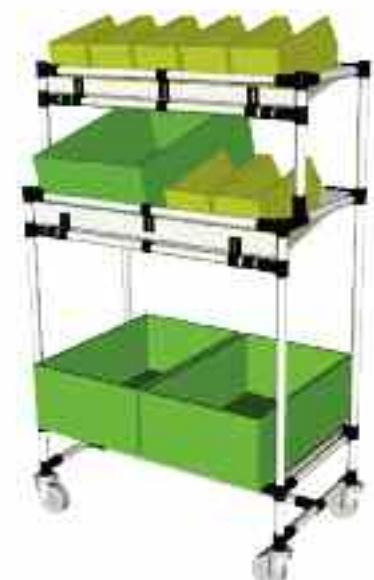
# Service trolleys



Illustration of how to eliminate the muda caused by transport.  
Nothing is more economical than manually-operated LeanTek® trolleys  
to transport components from the supermarket to the line-side.  
Kaizen progressively reduces the distances travelled by  
components within the plant, to the point of eliminating small  
motorized trains, where this is a feasible option.



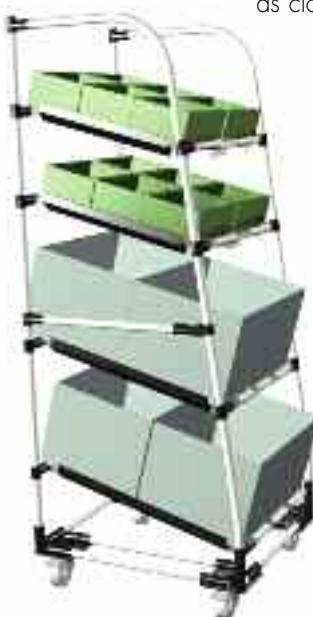
A simple system should never  
be costly to design and  
produce.  
LeanTek® service trolleys can  
be assembled in a very short  
time by their users.  
Service trolleys lie at the very  
heart of the production  
process, so it is vital that they  
are easily adaptable.



# Workstations



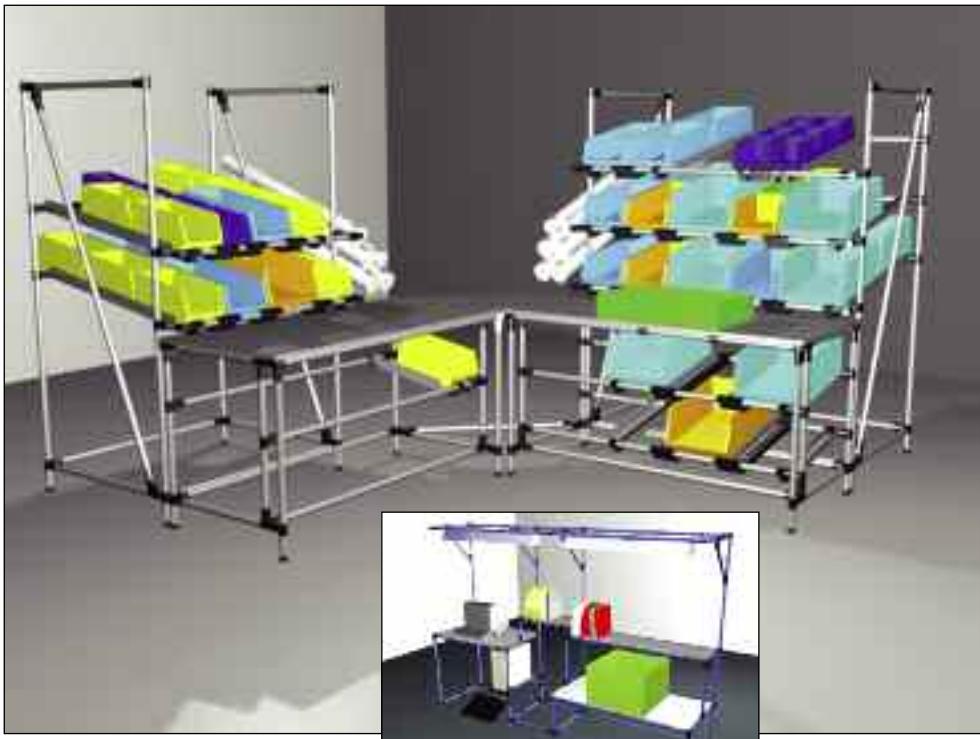
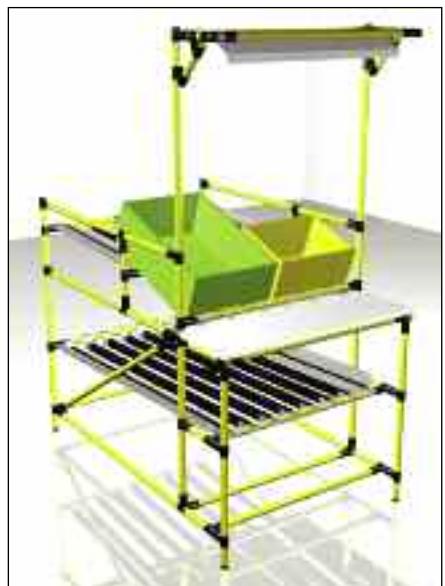
The light weight of the LeanTek® system is a significant advantage when it comes to service trolley applications, because operators pull them, push them and must be able to get them as close as possible to the value creation site.



LeanTek® workstation applications address the Muda created by unnecessary movement. By bringing components and accessories within the immediate reach of operators, LeanTek® workstations optimize actions and movements, leaving operators free to focus on the creation of value.



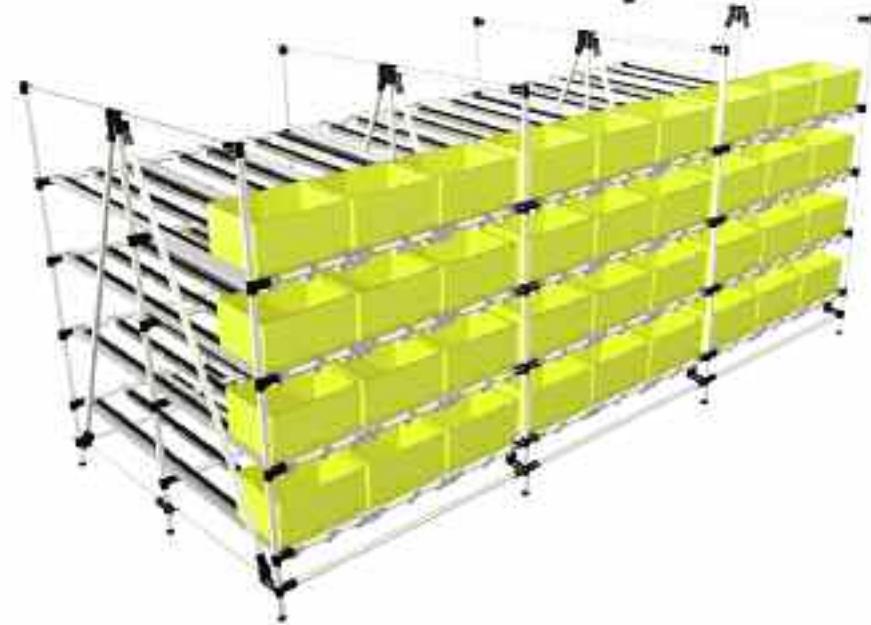
The Lean Manufacturing method recommends that production lines are laid out in a U-configuration so the component entry and exit points are close to each other, thus reducing the Muda created by waiting, transport and overproduction. U-shaped lines remain optimized when they incorporate front picking.



# Lean Manufacturing supermarkets



Multipurpose supermarkets are essential for Lean Manufacturing. Applying the principle of manually portable containers makes it possible to eliminate heavy stock and replace forklift trucks with trains. Supermarkets are particularly effective at addressing the Muda caused by transport and unnecessary movement. They form the single interface between the delivery bay and the line-side. The muda caused by transport is reduced by moving supermarkets progressively closer to the line-side.



Although some supermarkets are standard in design, those that pass through several Kaizen stages become real hybrids reflecting the vitality of the production environment.

LeanTek® encourages creativity in the workplace, which is a highly motivating factor for users.

# Kaizen in practice



The Kaizen attitude requires a willingness to accommodate permanent change.

This means a daily hunt to eliminate Muda and a willingness to improve within the framework of a 3-stage process:

Identify the Muda, isolate it and eliminate it.

Continual improvement means creating a standard work reference and then improving it continually.

LeanTek® is therefore a tool for implementing Kaizen.

# Delivery options

Trilogiq offers 4 different delivery options for the LeanTek® system:

- ① Components only (following initial training).
- ② Series production of fully assembled products manufactured to approved plans.
- ③ Hoshin truck.
- ④ Rack kits.



# Bulk components

## Bulk supply of products in kit form

### Tubes, joints and accessories.

With bulk supplies, you receive the components in whole packaging units. Bulk orders may be placed with your nearest Trilogiq dealer, either by traditional

means (fax, post or e-mail) or by using our new online ordering facility at [www.trilogiq.com](http://www.trilogiq.com). The online ordering system also lets you track your

orders and delivery times, but before you can order you must register as a member. It's a simple process – just ask your Trilogiq sales engineer for details.



## Fully-assembled products supplied by your Trilogiq centre.

This is the more normal route. It begins with the prototype design stage.

You have two options:

- Our CAO centre will design and draft your applications in 3D for your approval.

- For more complex applications whose operation must be validated, we offer the full TechCentre prototype development service.

Series products are assembled in our own plants before delivery direct to yours.



# The Hoshin truck

## The most responsive solution

Where complex applications must be implemented very quickly, the Hoshin truck is usually the most effective solution.

Your sales manager evaluates your component requirements and arranges for their delivery to your site.

He then works quickly to arrange for our Trilogiq "Hoshin Team" assembly team to

travel to your site and assemble the applications in your manufacturing environment.

Hoshin team assembly technicians are specialists in the most creative applications. With amazing responsiveness and availability, these teams resolve every technical issue with incredible effectiveness.



# The rack kit: pre-assembly

**When you want to assemble a series of flow racks yourself, but would prefer to limit the assembly tasks to the absolute minimum.**



① You receive the sides pre-assembled.



② You cut your supporting bars to length and assemble your rack to the required width.



③ Add the required number of roller tracks.

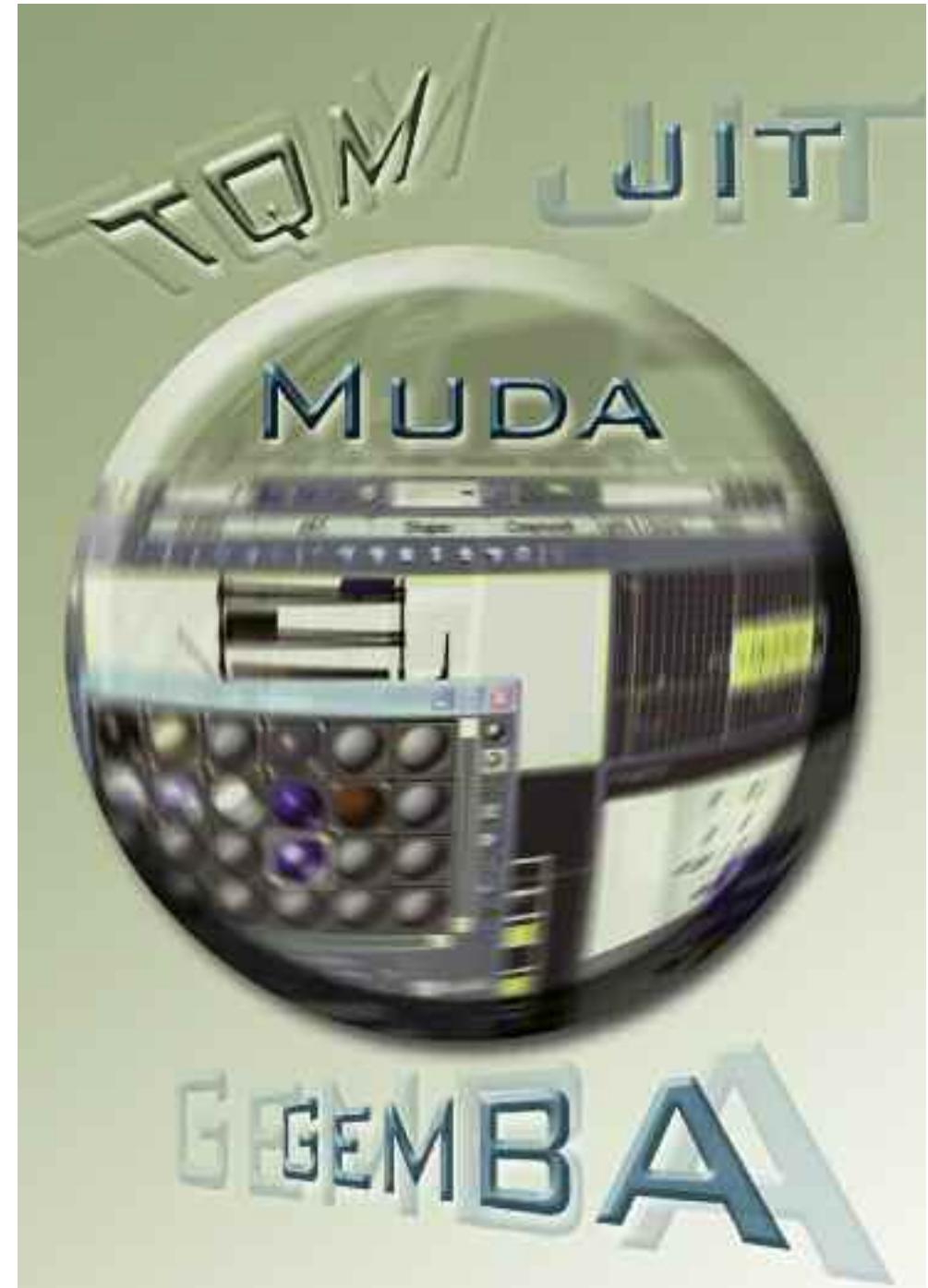
With the pre-assembled Rack Kit, Trilogiq assembles the sides so that all you have to do is make the trolley as wide as you need by fitting the bars to support the roller tracks. In this way, Trilogiq does around 60% of the assembly work.

This delivery option gives you freedom over the front and back design of the rack, as well as the type and number of roller tracks. A very fast and simple assembly solution.

## ■ Trilogiq Services

LeanTek® is much more than just a range of products.

Trilogiq also offers you a suite of services designed to help you make best use of LeanTek® equipment as part of a total operational solution for Lean Manufacturing.



# The web site: [www.trilogiq.com](http://www.trilogiq.com)

## [www.trilogiq.com](http://www.trilogiq.com)

The purpose of Trilogiq services is to help you design, assemble and install your line-side systems. When you visit the [www.trilogiq.com](http://www.trilogiq.com) web site, you will find all the key information you need about Trilogiq applications and services.

When you become a member of the site, you will also be able to access the following services:

- Information on the product range, product technical sheets and product applications.
- New products and their applications.
- Online ordering service
- Details of Trilogiq events



Practical shopfloor Kaizen seminars are exclusive to Trilogiq. Supported by our consultant partners, this part of the site invites you to register online and take part (free of charge) in sessions discussing the benefits of using LeanTek® products in a Kaizen environment, Hoshin projects, space saving projects, etc.

*Kaizen seminars  
help you  
maximize  
LeanTek®  
flexibility.*

## Kaizen seminars



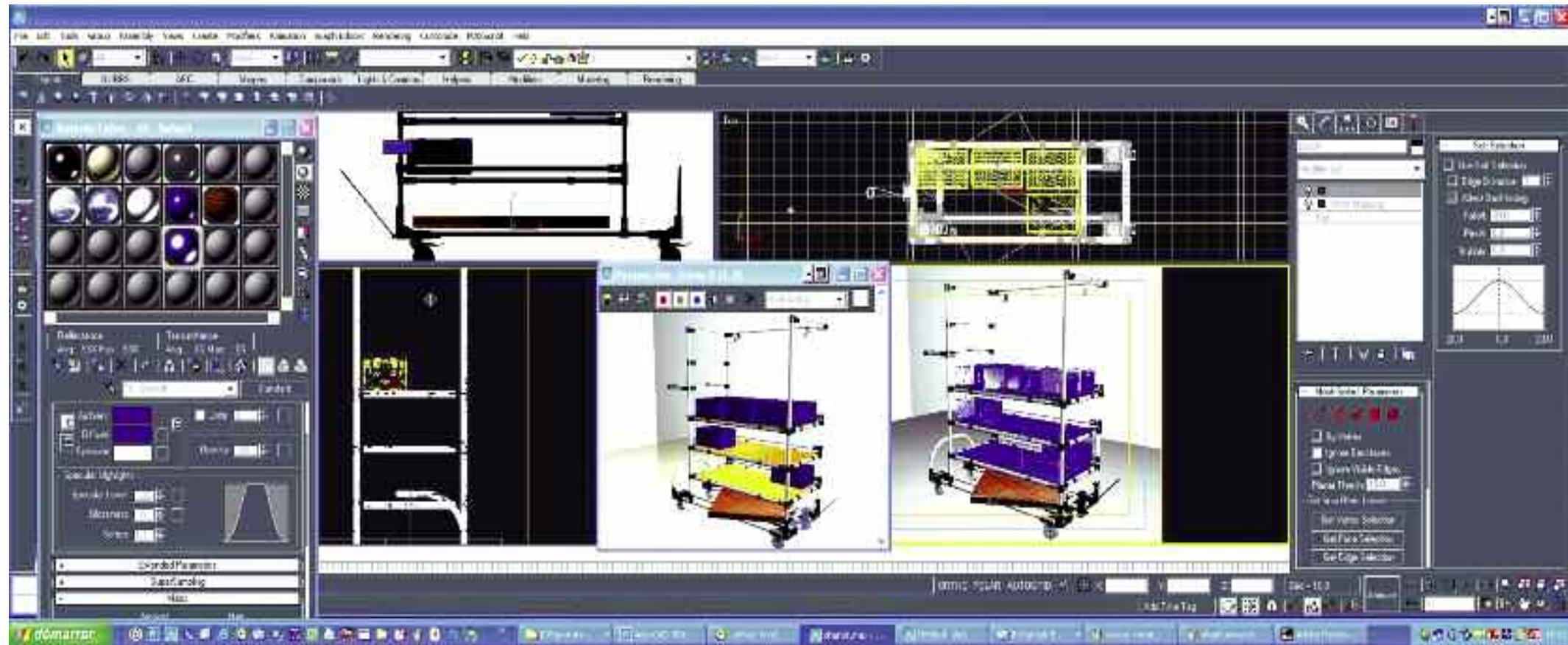
# Computer-Aided Design

LeanTek® systems are designed using the CAD systems of our Trilogiq Tech Centers.

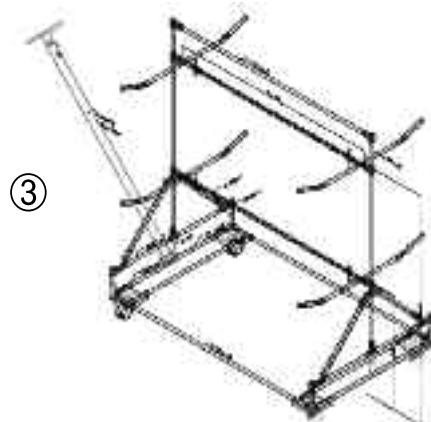
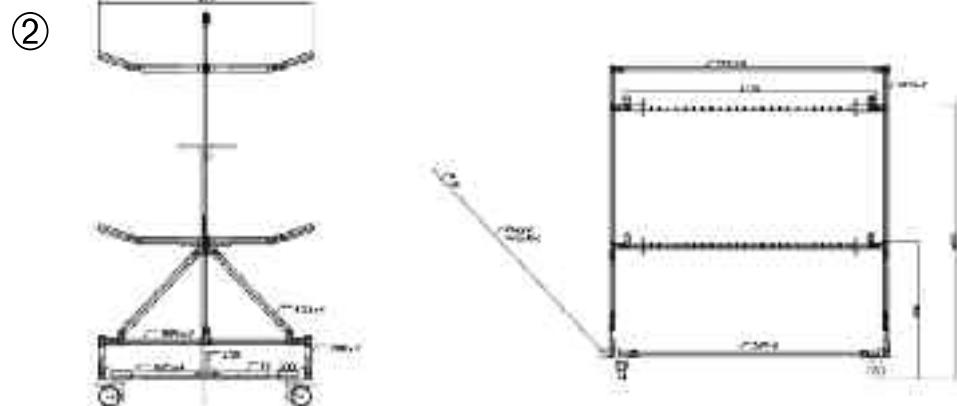
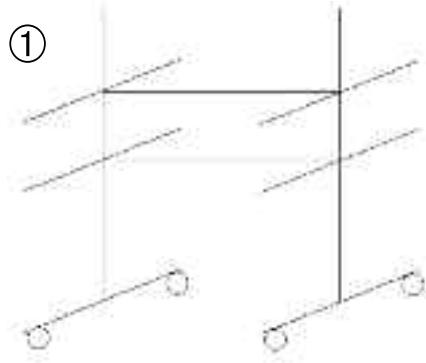
Every application can be modelled to test and validate load points.

The Trilogiq CAD system can create photo-realistic 3D images of your application before it becomes a reality. You can then examine that application from every angle in 3D motion and even visualize it in its working environment.

Trilogiq CAD centres also design and develop all our new LeanTek® products.



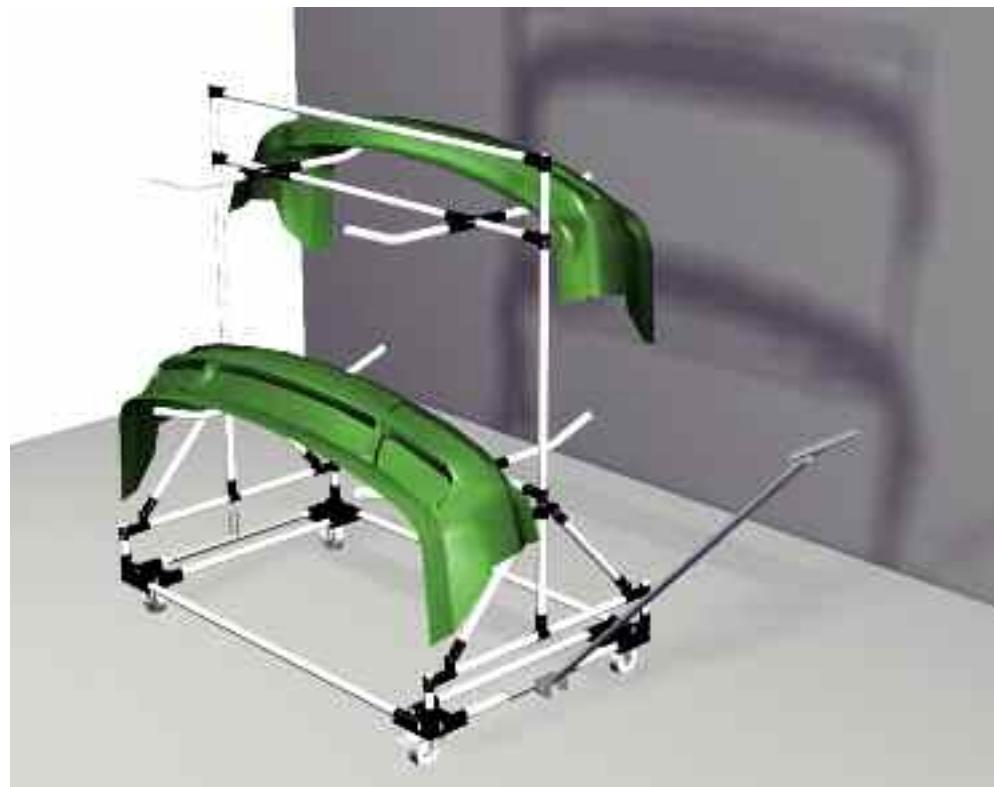
# Computer-Aided Design



Your need often begins with just an idea or an outline concept ①. Trilogiq's computerized design and simulation system transforms this informal concept into 2D ② plans, and then into a 3D ③ model. This is then used to validate the feasibility, loading constraints and practicality of the design. At this stage, you have a clear view of what is possible.

## ④ Picture-realism simulation

The Trilogiq image simulator can create one or more picture-realism images of your virtual application before it exists in reality. This simulation allows you to fine-tune your design by adding details such as the environment in which it will work or the colours you prefer. You can also view the virtual model of the application from every possible angle in order to check every aspect in a way that is simply not possible with 2D technical plans.



# Computer-Aided prototype design at our Tech Centres



Trilogiq TechCentres invites you to work with our technicians to validate your pre-production prototypes.

You have the ideas; we have the expertise – together, we can design robust systems that will stand the test of time.

Our specialists apply the basic rules of mechanical engineering to the assembly process, so your prototype will accurately reflect your production systems.

Your visit to the Tech Centre to check your prototypes gives you direct access to the best of LeanTek®.

Whether you contact your Trilogiq sales manager, register online or call your nearest TechCentre, accessing the expertise of Trilogiq has never been easier.



# The LeanTek® assembly school

Join a LeanTek® assembly school seminar and you'll soon have the confidence and competence needed to assemble durable applications at minimum cost.



If you would like your technicians to become expert in assembling LeanTek® applications as part of introducing Kaizen projects into your plants, our Trilogiq TechCenter assembly schools are ready to train your staff in all the rules and tips of LeanTek® assembly.

The aim of the training sessions we run is to familiarize your operators with the appropriate use of LeanTek® components and the rules governing their assembly. Courses take the form of practical interactive seminars.

## ■ LeanTek® components and their uses

The LeanTek® product range is built around three simple principles: strength, multi-functionality and durability.

- Strength is an essential quality in the industrial environment: our experience of the stresses placed on tubes and roller tracks over the years have led to exclusive LeanTek® solutions, such as riveting our roller tracks and the use of 2 mm tubes.
- Multifunctionality is ensured through the mutual compatibility of all components, which minimises impractical diversity.
- Durability comes primarily from the close attention paid to the anti-corrosion coatings we apply to tubes and joints.



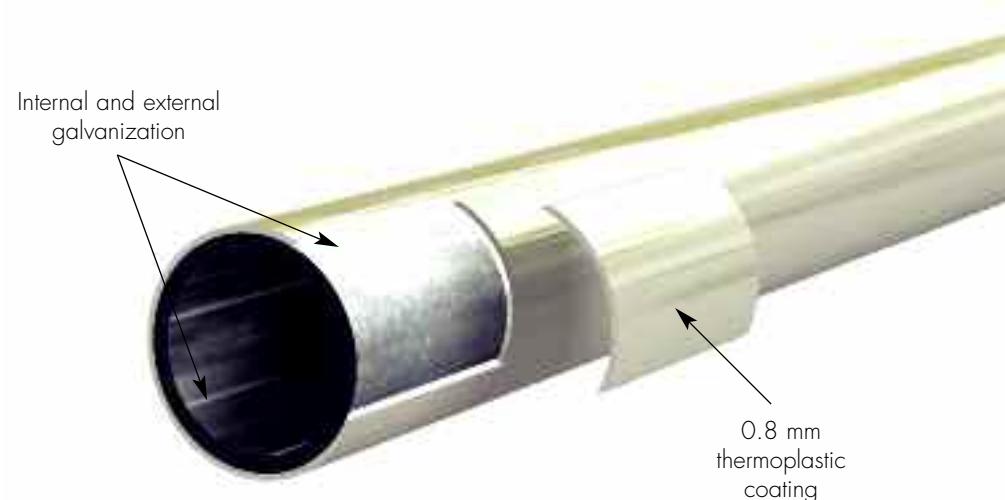
The outer diameter of LeanTek® tubes is 28.6 mm.

2 wall thicknesses are offered: 1,25 mm for lightweight applications, and 2 mm for heavier applications.

Tubes are available in a wide range of standard colours.

Since we manufacture our own tubes, we can supply them in any non-standard colour you wish.

LeanTek® tubes are galvanized inside and out before receiving their 0.8 mm thermoplastic coating in our own production plants.



## Advantages of LeanTek

### Antirust treatment

Conventional tubes usually do not have antirust protection on the outside of the tube and in some cases not on the inside either. The 2 consequences of rust are; a reduction in the strength of the tube , reduced strength of the application and the appearance of blisters on the thermoplastic coating.



Trilogiq tubes guarantee strength, durability and longevity of appearance by using full internal and external galvanisation before application of the thermoplastic coating in the factory.



### Tube thickness

Trilogiq quote tube thicknesses corresponding to the thickness of the steel part only and not to the steel part + the plastic coating.treatment.

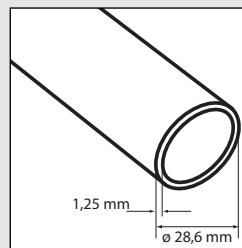
# Tubes

400 cm

## T1,25-400



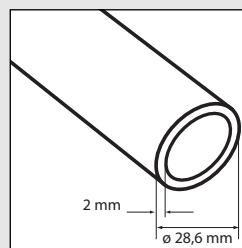
Designed for low load structures, this tube is used mostly for smaller applications or where structures require to be lightened.



## T2-400



As the benchmark in strength, this tube is ideal for reinforced applications.



## T-1 and T-2 tubes are also available in the following colours:



- Black
- Ivory
- Grey
- White
- Brown
- Red

- Blue
- Yellow
- Green

Special colours:  
on request

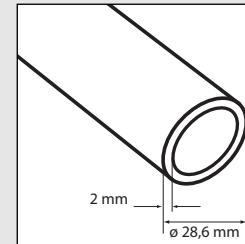
# Tubes

400 cm

## T2-400 ESD Antistatic version



Available in T1,25-400 ESD (1 mm).

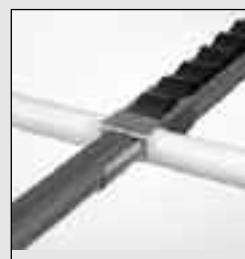
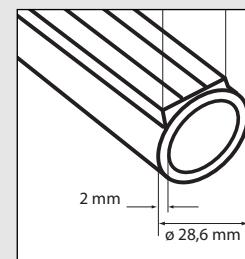


## SP 400

## Flat-edged tube



Grooved tube providing minimum contact.  
Associated connectors:  
F-M round.



# Tubes

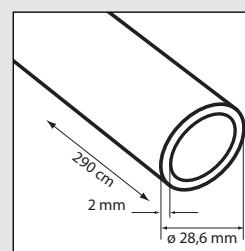
290 cm

**SST-290**

(290 cm)

NICO nitrogen, carbon and oxygen

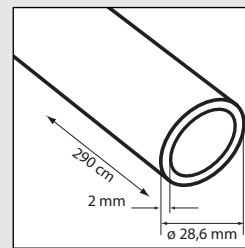
Diameter 28.6 mm



**SST-290LT** (290 cm)

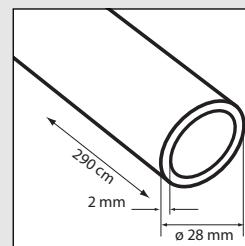
NICO nitrogen, carbon and oxygen

Diameter 28.6 mm



**SST-290F** (290 cm)

Diameter 28.6 mm



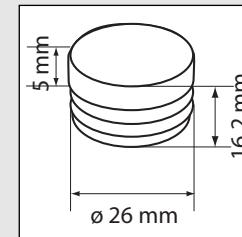
# Tubes

Associated accessories

**F-4**

Safety cap- End cap

This cap is a perfect fit in T1,25 and T2 tubes and covers all vertical tube cuts to provide protection for users. Fitted using a mallet.

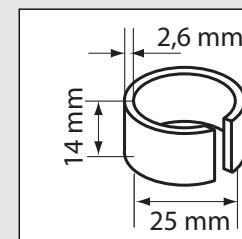


**F-2B**

Levelling bush

This bush takes up the difference in height between joints and tubes.

This accessory is used in the design of work surfaces.

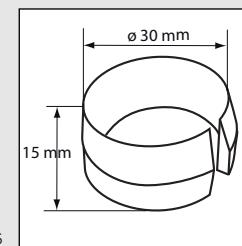


**F-8**

Anti jamming ring



Tapered anti stop ring for black joints

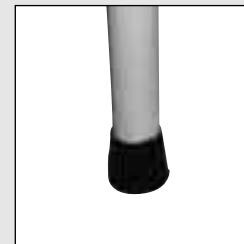
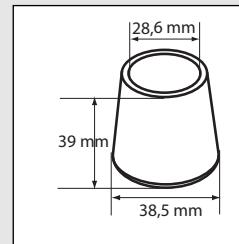


# Tubes

## Associated accessories

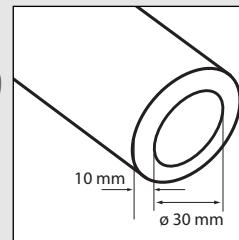
### GF-1 Rubber foot

Finishes vertical tubes with a foot.

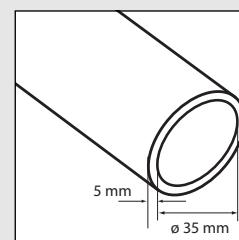


### 100-MP Protective foam

Supplied in 1 metre lengths, this 1 cm thick foam sheath fits over the tubes to protect your components against impact.



### 200-MCP Protective rubber



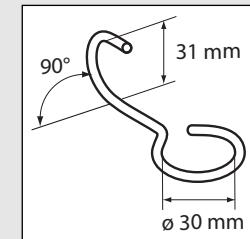
# Tubes

## Associated accessories

### C-I 90° hook



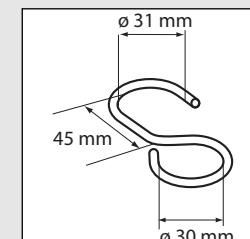
Useful for carrying accessories, this hook is a vital part of vertical transfer systems.



### C-P Flat hook



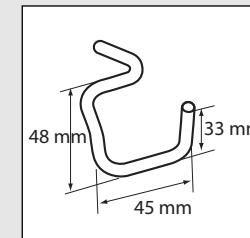
Like the C-I model, this hook is also useful for carrying accessories in LeanTek® applications.



### QL-1



Safety hook for quick adjustment.





# Connector joints

## Standard joints

Trilogiq has been designing, developing and continually improving the range of LeanTek® joints ever since 1996.

The range of 3D® multi-directional connector joints is one of the results of this constant quest for innovation.

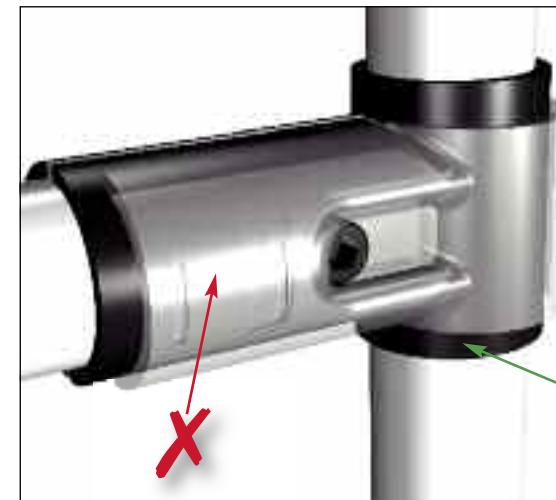
Each joint is manufactured by an automated tool system; the only technique capable of delivering production stability and regularity.

Joints are finished with a reinforced black zinc coating, which delivers an attractive finish, guaranteed corrosion resistance (even in severe environments) and high impact resistance.



# Connector joints

## Advantages of LeanTek



### Large size joints

Main advantages of large size LeanTek® connectors: easier fitting and above all greater shock resistance giving better durability to the application.



### Black zinc coating

Over the last 10 years Trilogiq have observed that paint on connectors does not stand up to the passage of time: the paint very often peels off in sheets, allowing rust to enter. Consequently Trilogiq have opted for black zinc treatment for LeanTek® connectors. This treatment offers greatly enhanced qualities of strength and durability compared to paint.

# Joints

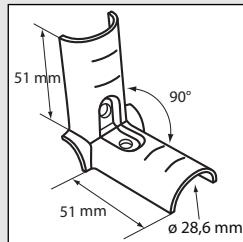
## Standard joints

Securing screw: S1-S4

### F-A 90° connector joint



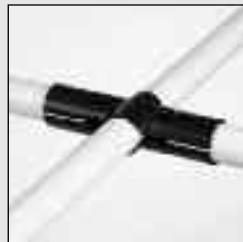
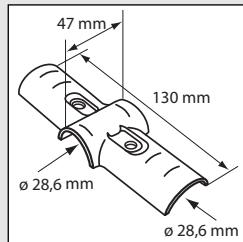
The F-A joint can be combined with F-B, F-A and F-C joints.



### F-B 90° junction



This joint can be combined with another F-B or a 2 F-A joint.



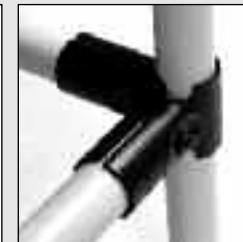
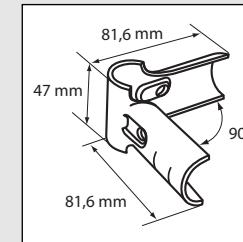
# Joints

## Standard joints

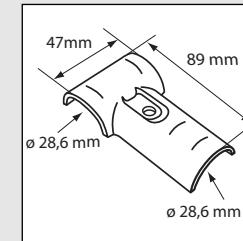
### F-C 270° connector joint



This 270° joint can be combined only with the F-A joint.



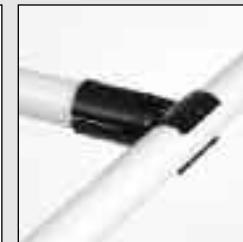
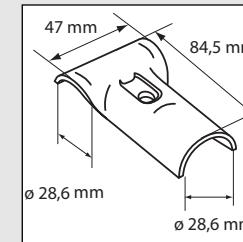
### F-D Standard 90° joint



### F-Dt Tangential 90° joint



This joint enables structural extensions whilst acting as a guide to accommodate standard and flat-edged tubes (SP-400).

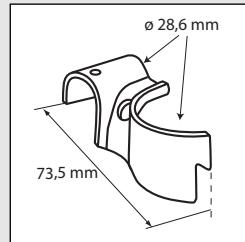


# Joints

## Standard joints

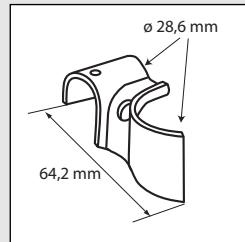
### F-E Crossover joint

This joint is fitted internally on low-load applications.



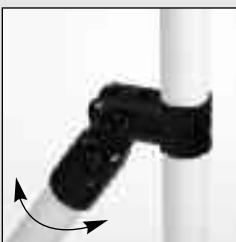
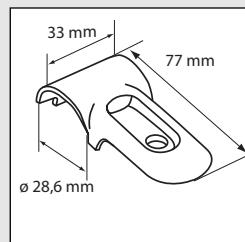
### F-Et Tangential 90° joint

Guidance.



### F-F Standard adjustable angle joint

Used to enable diagonal bracing of applications using 2 variable angle components. Works in conjunction with the F-G joint.

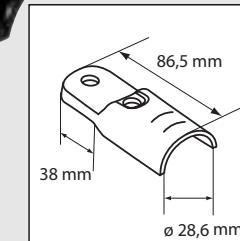


# Joints

## Standard joints

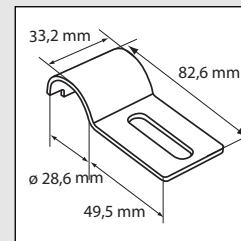
### F-G Standard angle joint

Used to create diagonal braces, it may be combined with the F-F, F-K and F-T joints.

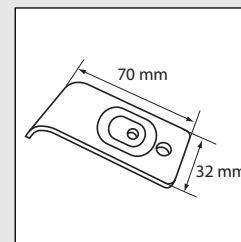


### F-H Multifunction attachment joint

This joint enables tubes to be connected to any other kind of structure. Interfaces with the M-400 monorail. (cf pages 112 and 194).



### F-QA Joint support multifonctions A

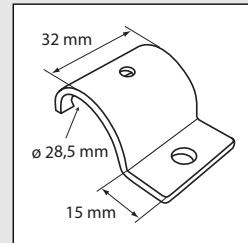


F-QA + FQB

# Joints

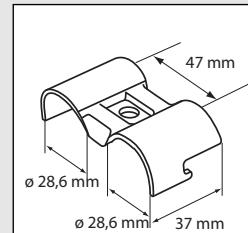
## Standard joints

### F-QB Joint support multifonctions B

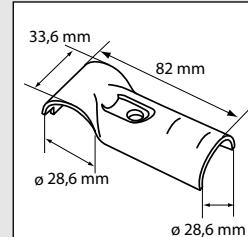


### F-I Paired running joint

Paired running joints are used to strengthen applications or double tubes.

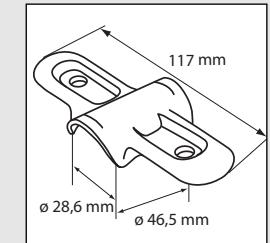


### F-J



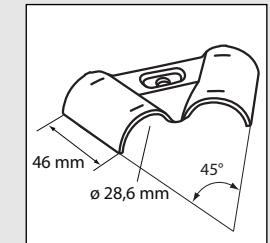
### F-K Double F-F

Works in conjunction with FG"



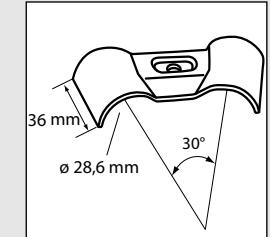
### F-L 45° joint

2-part 45° joint for diagonal bracing of an application. (cf page 168).



### F-L30 30° joint

2-part 30° joint for diagonal bracing of an application. (cf page 168).



# Joints

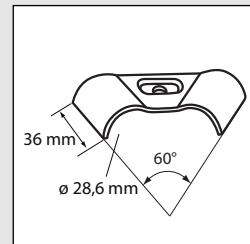
## Standard joints

# Joints

## Standard joints

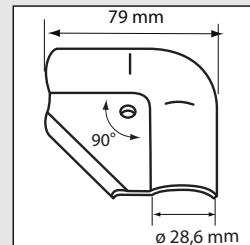
### F-L60 60° joint

2-part 60° joint for diagonal bracing of an application.  
(cf page 168).



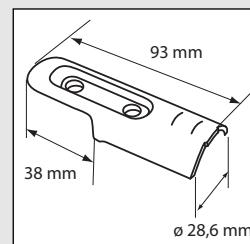
### F-L 90

Brevet N° 000928833/08305177.1



### F-T Angle joint

Enables the free or fixed articulation of 2 tubes.  
Used for corner racks and multiform work surfaces.  
(cf page 169).



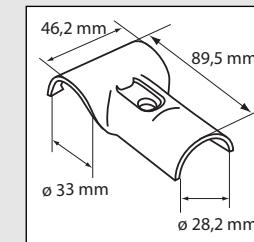
33 mm joints save space  
by fitting over standard joints.

# Joints

Ø 33 mm

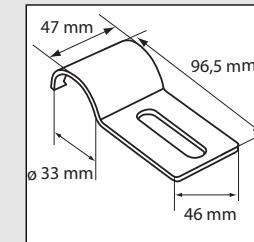
### F-D2 90° over-joint

Often used in applications subject  
to heavy loads.



### F-H2 Multifunction attachment joint

This joint is used for many different purposes,  
including fixing LeanTek® applications to  
your production modules.

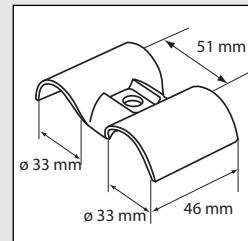
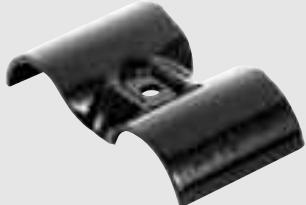


# Joints

Ø 33 mm

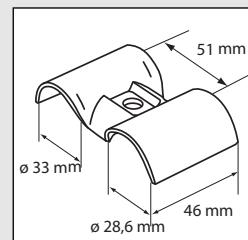
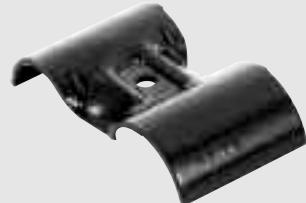
## F-i2 Paired running joint to secure 2 existing joints

This joint is used for many different purposes, including fixing LeanTek® applications to each other.



## F-i3 Paired running joint to secure a standard tube to a joint

Saves space when reinforcing applications.



The sliding joints in the F-V range allow tubes to slide in relation to each other.

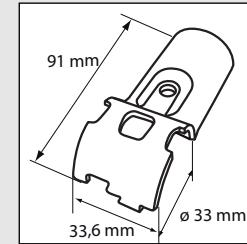
# Joints

## Sliding joints

## F-V1 F-D sliding



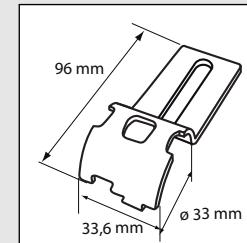
F-V1 is used mainly to provide rapid adjustment of flow rack levels. (cf page 186).



## F-V2 F-H sliding



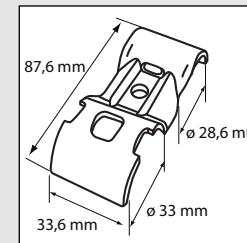
Protect your operators by separating them from your production modules using removable barriers and doors.



## F-V3 Multifunction attachment joints



Use as a hinge or system for telescopic applications.

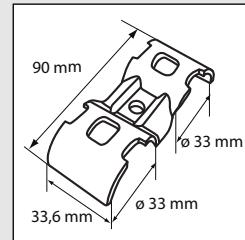


# Joints

## Sliding joints

### F-V4 Paired running joint to attach 2 x 33 mm diameter tubes

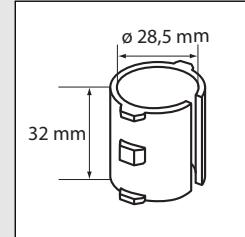
Use as a hinge with one of the 2 tubes remaining fixed.



### F-7 Sliding bush



The F-7 (polyethylene) bush is used to allow F-V joints to slide smoothly over the tubes.

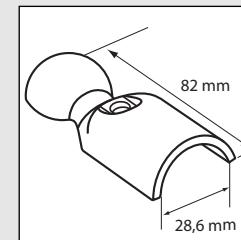


These 3D joints are a Trilogiq innovation and allow tubes to be connected at any angle in all 3 dimensions.

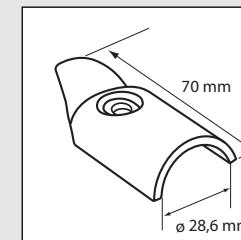
# Joints

## 3-D

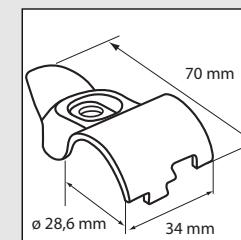
### 3D-A Free angle joint (closed sphere)



### 3D-B Free angle joint (open sphere)



### 3D-C Free angle joint (open sphere)



# Joints

## The ESD range

Used in conjunction with ESD antistatic tubes, these LeanTek® ESD joints help remove static electrical charges.

### Associated components:

- Standard ESD tubes
- Screws: ESD S1

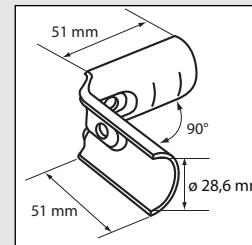
### Additional information:

- Joints not shown here are also available in an antistatic version on request

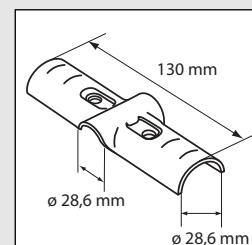
# Joints

## The ESD range

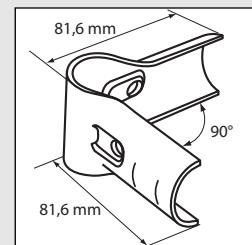
### F-A ESD



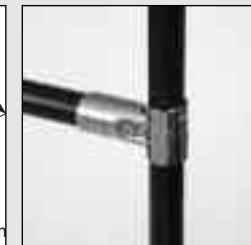
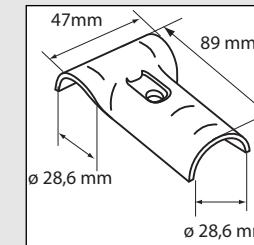
### F-B ESD



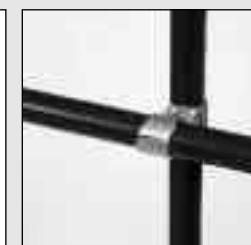
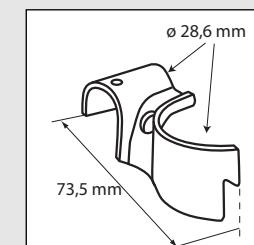
### F-C ESD



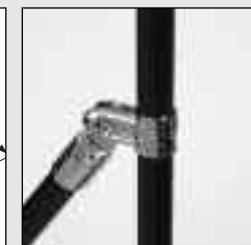
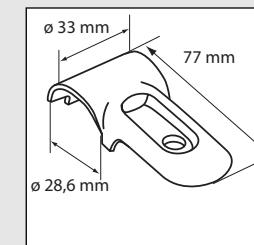
### F-D ESD



### F-E ESD



### F-F ESD



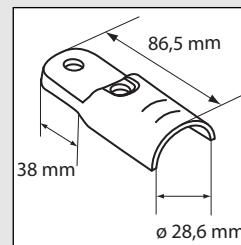
# Joints

## The ESD range

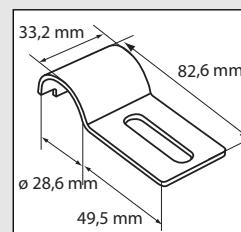
# Joints

## The ESD range

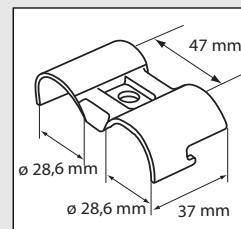
**F-G ESD**



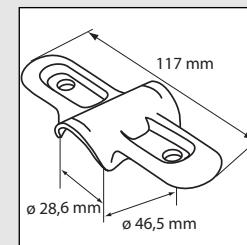
**F-H ESD**



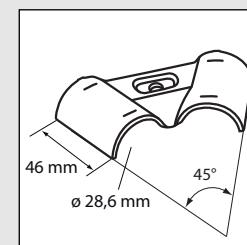
**F-I ESD**



**F-K ESD**

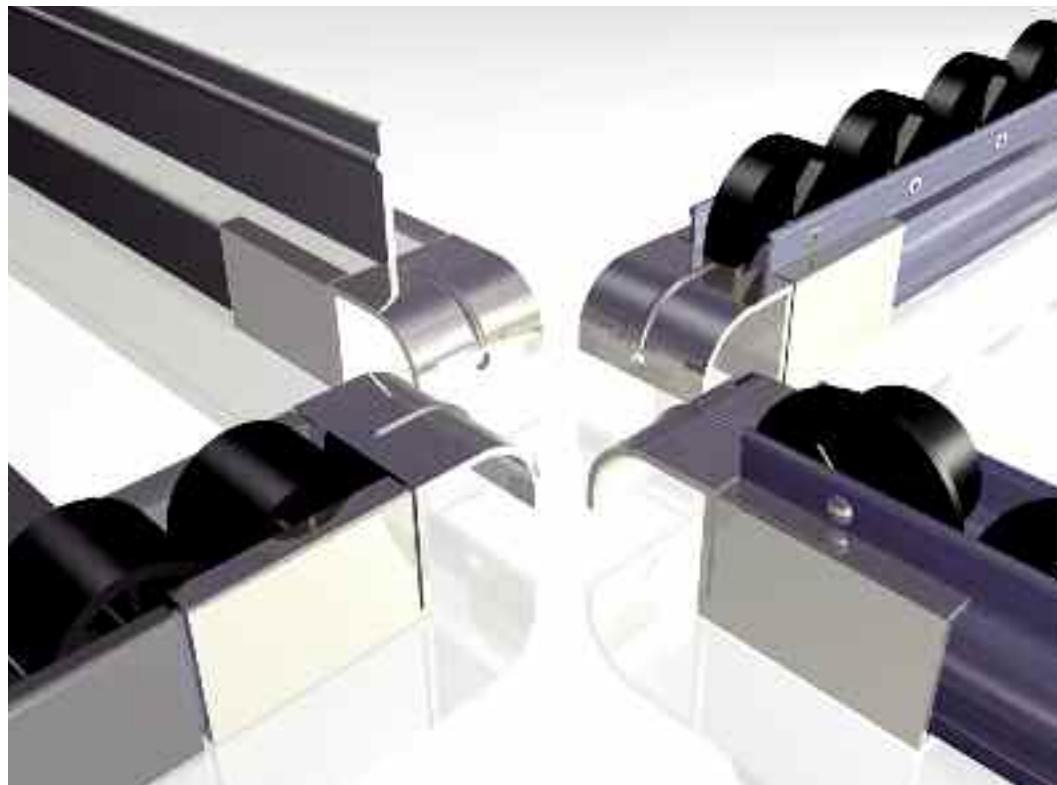


**F-L ESD**



# Multifunction connectors

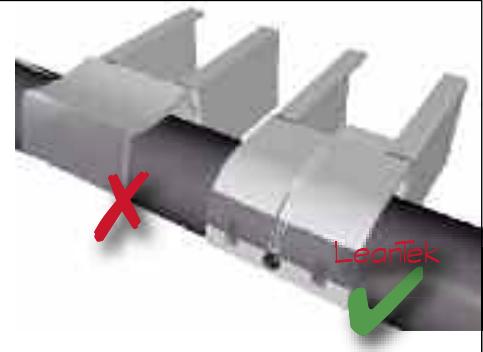
**Multipurpose:** By using a common shape for all F-M connectors, the whole of the LeanTek® range of roller tracks, descent guides and flat tubes can be fitted. Our policy of multipurpose characteristics and interchange ability guarantees the modularity of the LeanTek® system. F-M parts are coated with white zinc antirust treatment providing durability and good appearance.



## Advantages of LeanTek

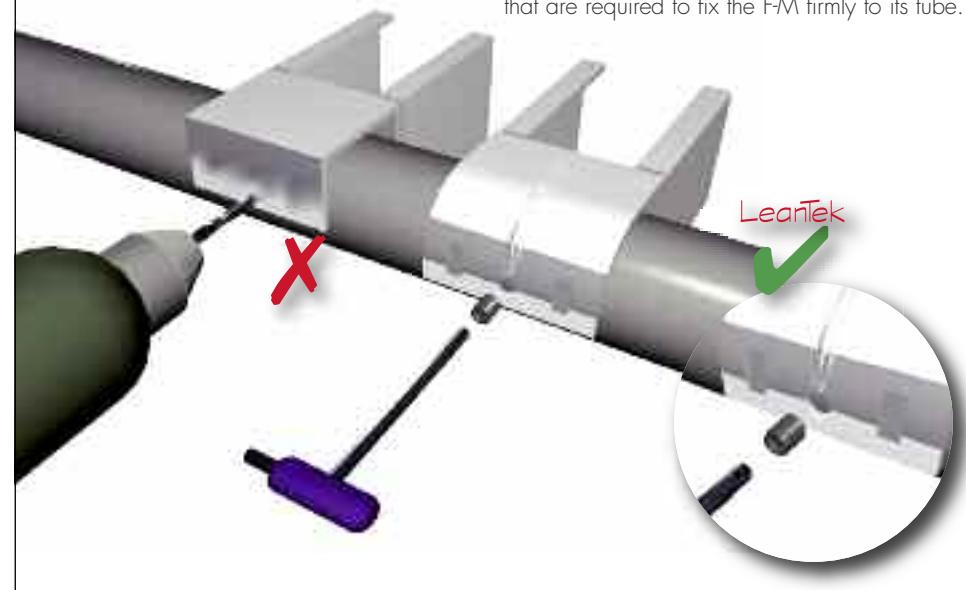
### A round, rather than square, shape:

A round, rather than square, shape: In addition to a pleasant appearance that matches the round shape of LeanTek® tubes and joints, the rounded shape of Trilogiq F-Ms spreads the load over the whole length of the product and not only on the point of contact. This results in much better shock and load resistance.



**Integral grub screws:** In conventional systems holding the rail bracket to the tube require drilling and riveting. This is a slow and laborious task. Trilogiq saves you this effort by offering integral tapped threads on its F-M range.

This makes the fitting of F-M fittings to the tube very easy: no drilling, no riveting, just an Allen key, a pointed grub screw and a few seconds are all that are required to fix the F-M firmly to its tube.



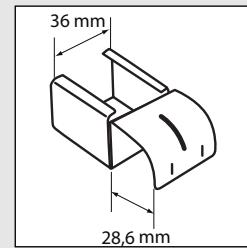
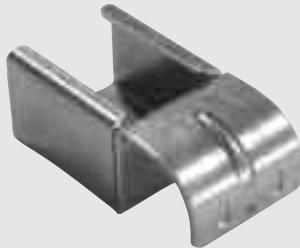
# Connectors

## Multifunction connectors

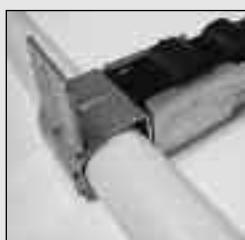
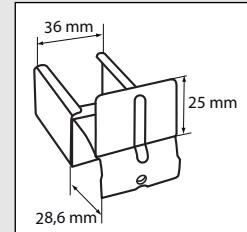
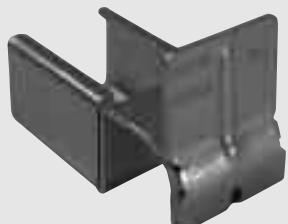
# Connectors

## Multifunction connectors

**F-M1** Standard connector for supply or guides (no endstop)

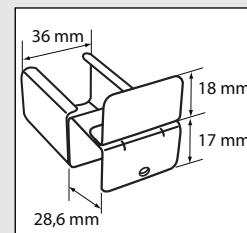
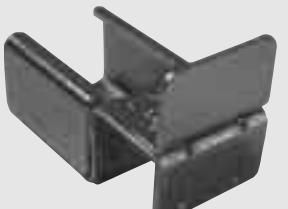


**F-M2** Standard connector for picking with low endstop (25mm)



**F-M2R** High strength connector for picking with low endstop (18mm)

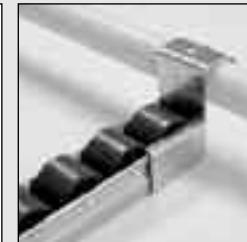
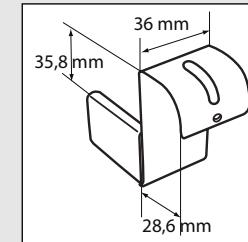
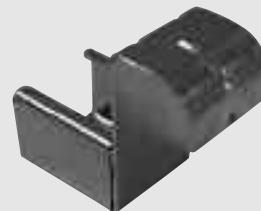
High strength.



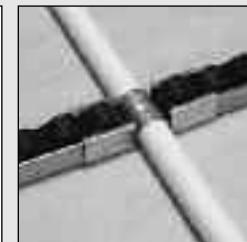
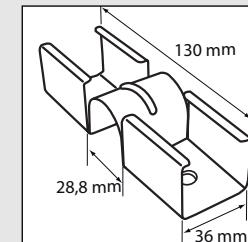
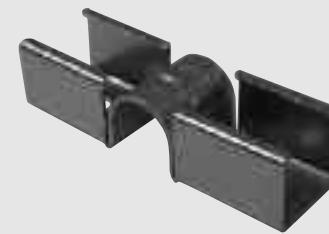
# Connectors

## Multifunction connectors

**F-M3** Connection for picking with high endstop (30 mm)



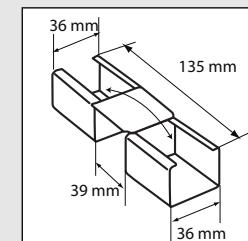
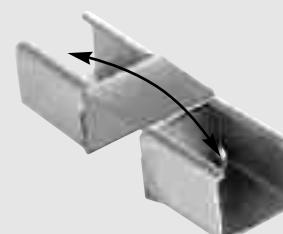
**F-M4** Bridge with tube junction



**F-M4 Flex** Flexible bridge

This connector is used to join a standard tube to:

- Roller tracks
- Composite flat-edged tubes.

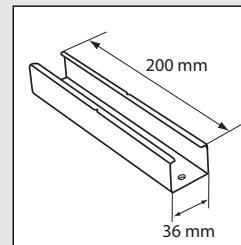


# Connectors

## Multifunction connectors

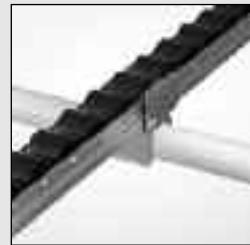
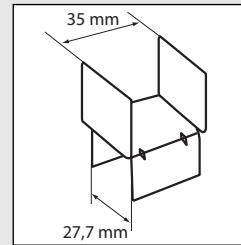
### F-M5 Direct bridge without tube junction

Enables connection of 2 lengths and recycling of fallen items.



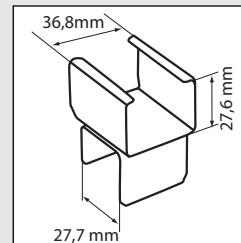
### F-M6 Intermediate supports

For the lateral stabilisation of roller tracks.



### F-M6r Intermediate supports

F-M6R has retainers.

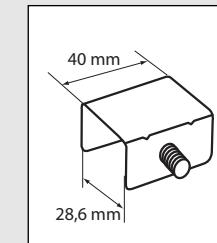


# Connectors

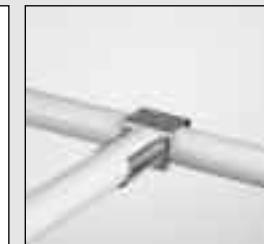
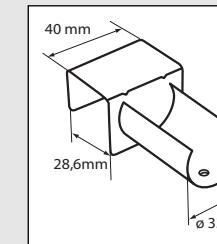
## Multifunction connectors

### F-M7 Roller connector

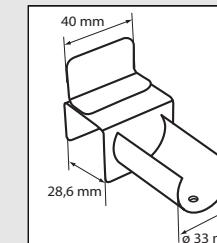
This connector can be used with 1 (TR) roller and its end cap (B-R) to create a set of rollers. (cf page 195).



### F-M8 Tube-tube or guide connection



### F-M8s Tube-tube connection with low endstop (20 mm)

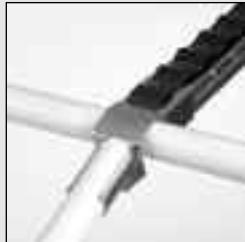
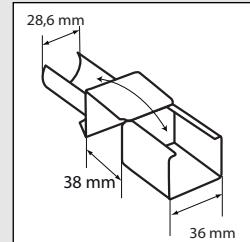
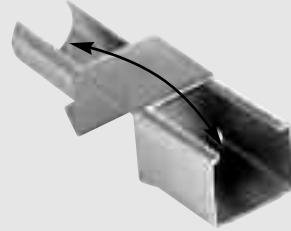


# Connectors

## Multifunction connectors

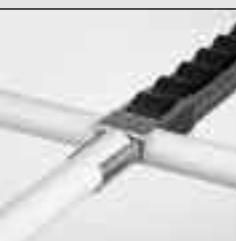
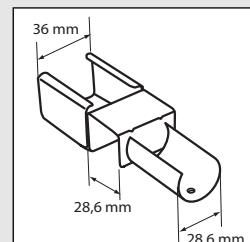
### F-M9 Flexible bridge for R-R and T-C / Tubes and S-P

Often used in picking racks and supply surfaces.



### F-M10 Bridge for RR-400 and TC-200 / Tubes and SP-400

Often used in picking racks and supply surfaces.

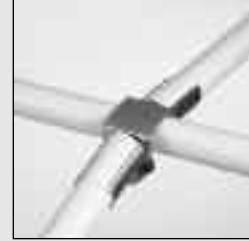
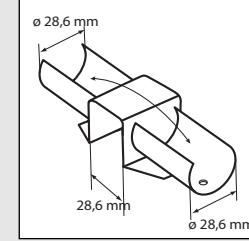
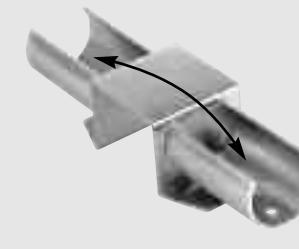


# Connectors

## Multifunction connectors

### F-M11 Flexible bridge for tubes

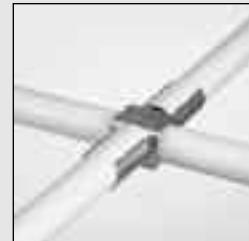
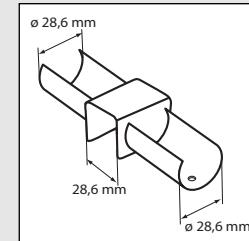
This connector is used to join 3 standard tubes.



### F-M12 Standard bridge for tubes

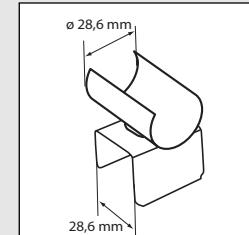
This connector is used to join a standard tube to:

- Standard tubes
- Flat-edged tubes (S-P)



### F-M13 Tangential intermediate support

Used as a guide. (cf page 183).



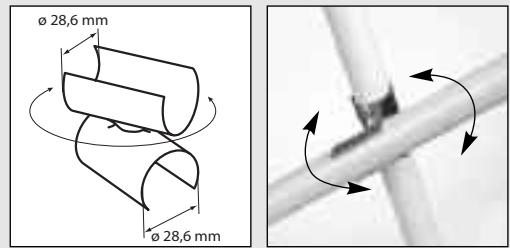
# Connectors

## Multifunction connectors

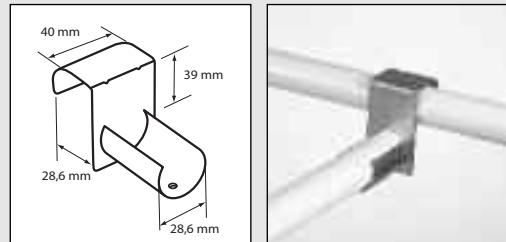
### F-M14 Rotating multifunction connector



Used in many configurations to follow gradients and create corners.



### F-M15 Tube-tube connection with high endstop (30 mm)



### F-M16

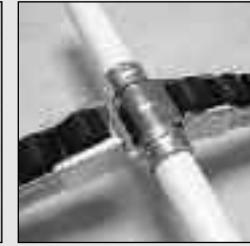
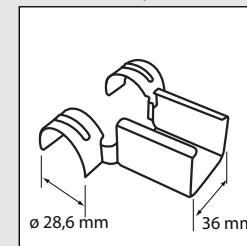
# Connectors

## Multifunction connectors

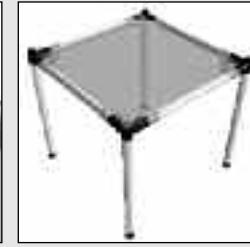
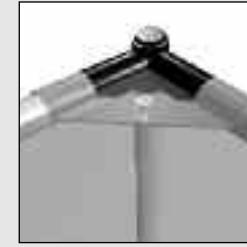
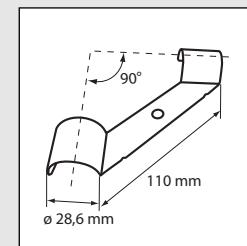
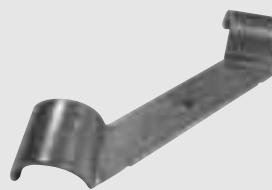
Patent n° 08305177.7/000937180



Used in conjunction with F-M1 for easy angle setting and adjustment



### F-M17 Plate support

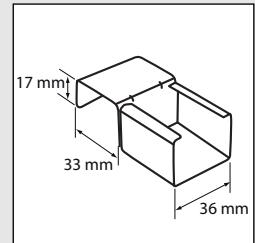


# Connectors

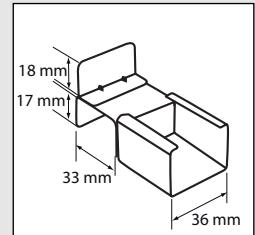
Ø 33 mm

These connectors save space by fixing directly over joints.

## 33-M1 Delivery connector without endstop



## 33-M2 Delivery connector with low endstop (20 mm)



# Roller tracks and conveyor systems

## Any resistance is useful...

Roller tracks are designed to cope with weight and impact.

These components are most often used for flow rack and supermarket applications, but they are also required to ensure the downward flow of components with minimum gradient and maximum smoothness, whilst offering inherent strength and compact size.

LeanTek® roller tracks respond to these requirements by offering some exclusive features:

- Large diameter rollers (34 to 44 mm):

These rollers are reinforced for added impact resistance, and their large diameter makes for smoother rotation.

- Rollers individually riveted into their tracks: this delivers incomparable durability. The 3.6 mm spindle is big enough to absorb impact and bear considerable weight.

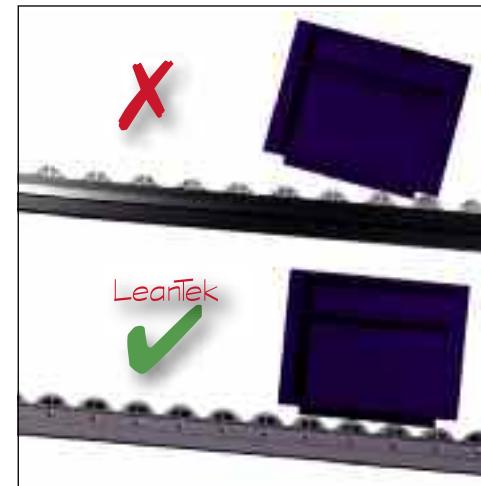
- Density: The RR-400 is exceptional in more ways than one: it features 28 rollers per meter, with just 2.1 mm between rollers.

These characteristics ensure remarkably regular descent, thus enabling shallower gradients and saving space.



# Roller tracks and conveyor systems

## Advantages of LeanTek



### Reduced distance between rollers

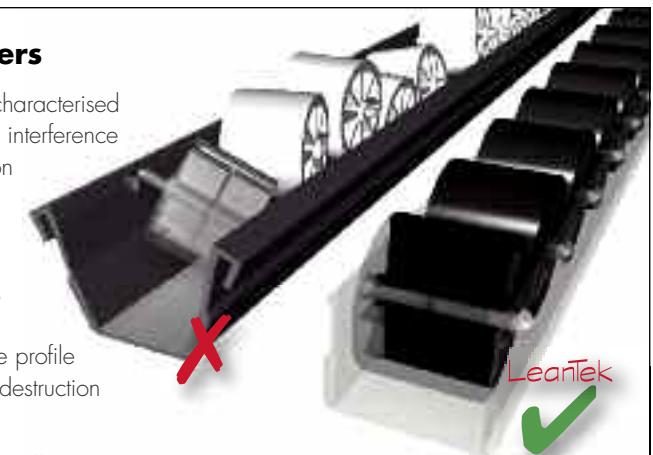
The distance between the RR 400 roller is 2.1 mm compared with 4 or 5 mm for competitors' products.

This unique characteristic reduces the losses in load spreading capacity and consequently reduces the impacts of the packages on the rails.

In total this gives better FIFO flow, silence of operation and longer roller and rail life.

### Riveting RR400 rollers

Conventional roller tracks are characterised by the fitting of the roller on an interference fitted pin. This cheap production technique fails to prevent the common issues of the opening of the profile and the roller jumping out under heavy loads or after a long period of use. Separation of the roller from the profile causes significant loss of flow, destruction of the rail and parts to fall out.



In its RR 400 roller track Trilogiq offers a durable product. RR 400 uses the technique of individual riveting of each roller to the profile. Consequently the profile is held closed and the rollers are retained permanently.

#### Consequence:

The integrity of the roller track is guaranteed over time, with continued product flow and remarkable operating silence.

# Roller tracks and conveyor systems

## Advantages of LeanTek

### Free rotation riveting

Another remarkable characteristic of the RR 400:

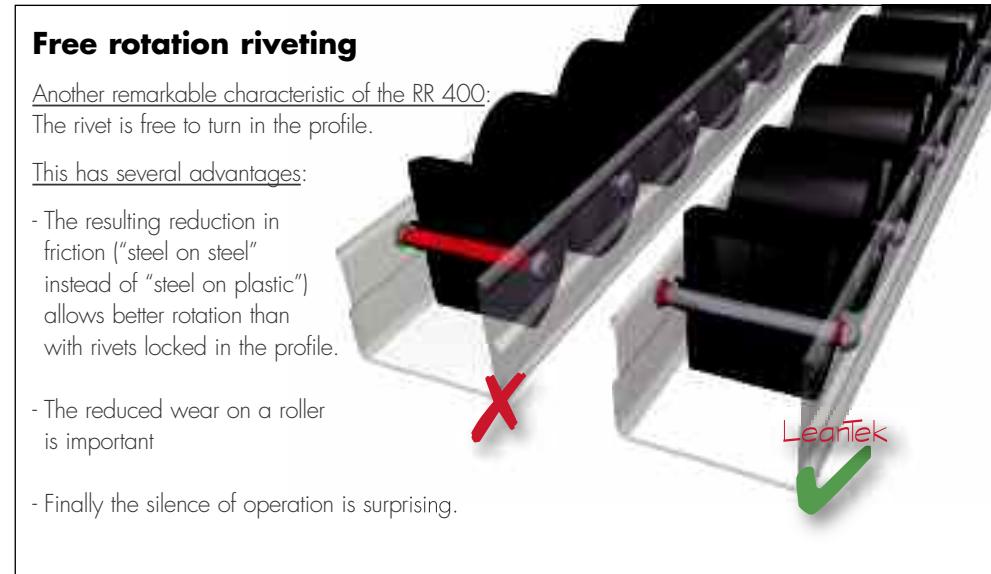
The rivet is free to turn in the profile.

This has several advantages:

- The resulting reduction in friction ("steel on steel" instead of "steel on plastic") allows better rotation than with rivets locked in the profile.

- The reduced wear on a roller is important

- Finally the silence of operation is surprising.

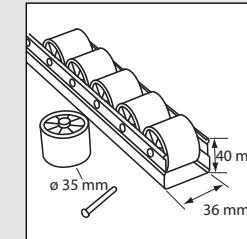


# Roller tracks Standard roller tracks

### RR-400 Standard roller track



34 mm diam. Rollers in 400 cm bars. The LeanTek® standard roller track is the best designed of its type for normal industrial applications.

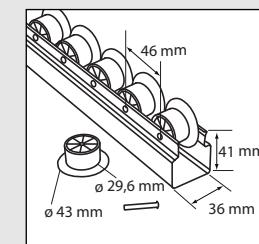


### FW-400



Reinforced profile guide track.  
Applications: rigid containers up to 150 mm wide.  
400 cm bars.

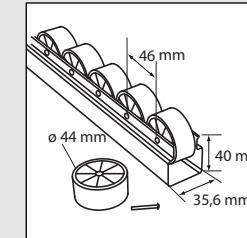
(cf page 191).



### LW-400



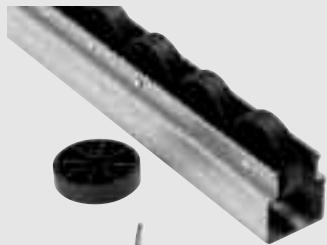
44 mm diameter rollers, 20 mm wide, with reinforced profile. Applications: large containers. 400 cm bars.  
(cf page 190).



# Roller tracks

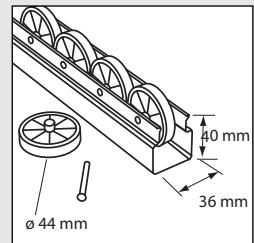
## Standard roller tracks

### SW-400 (400 cm)



44 mm diameter roller, 10 mm wide, reinforced profile: for KLT® self-guided applications. 400 cm bars.

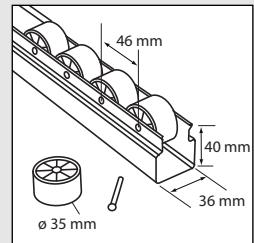
(cf page 192).



### RT-400 (400 cm)



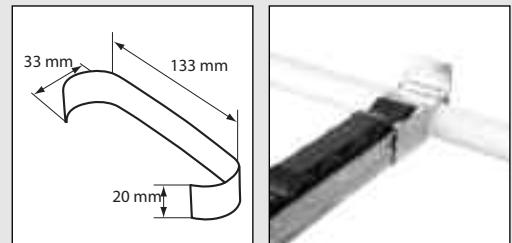
35 mm diameter rollers, 20 mm wide, reinforced profile. 400 cm bars. (cf page 193).



### F-RR Brake for RR-400



The most practical solution for bin, case and carton braking.  
Like all components, this product can be re-used thanks to the flexibility of the alloy used.

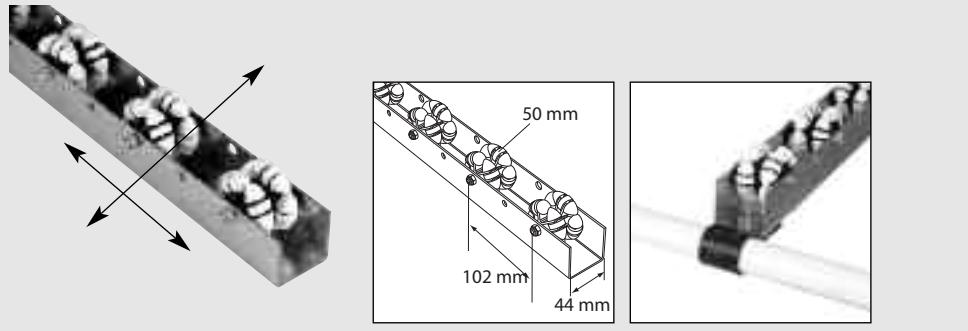


# Roller tracks

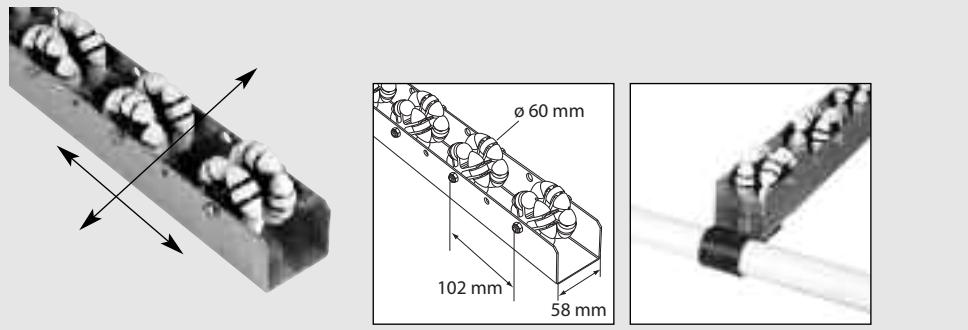
## Multidirectional roller tracks

Enabling the creation of bends and corners.

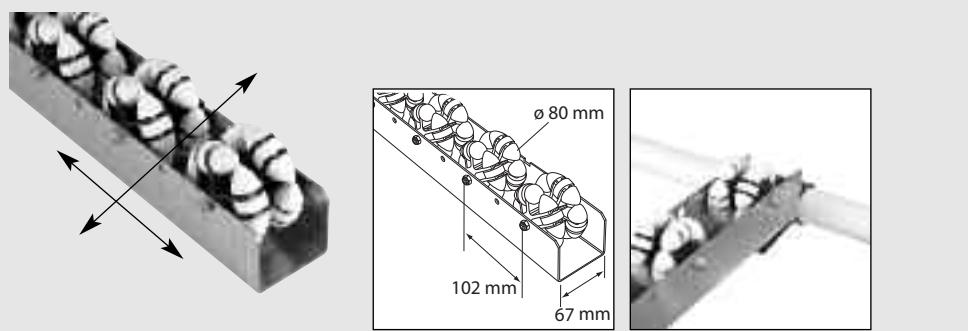
**RGM-50** Multidirectional roller tracks (wheel diameter: 50 mm)



**RGM-60** Multidirectional roller tracks (wheel diameter: 60 mm)



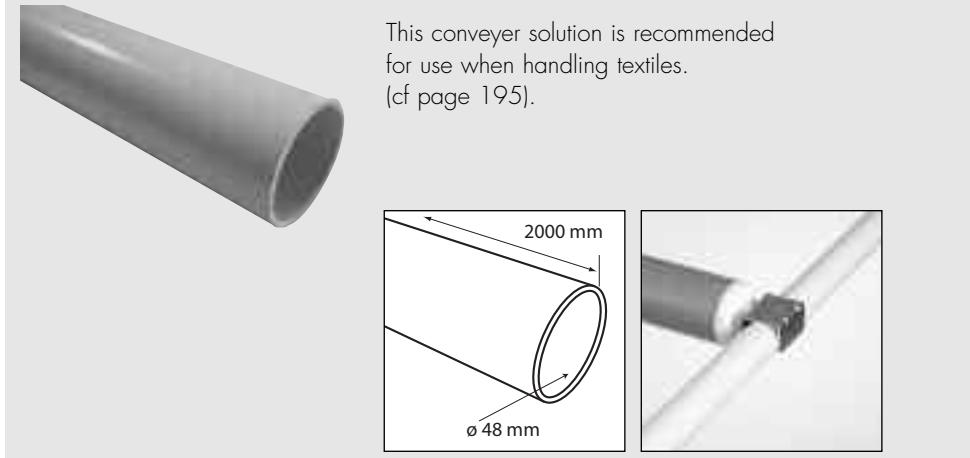
**RGM-80** Multidirectional roller tracks (wheel diameter: 80 mm)



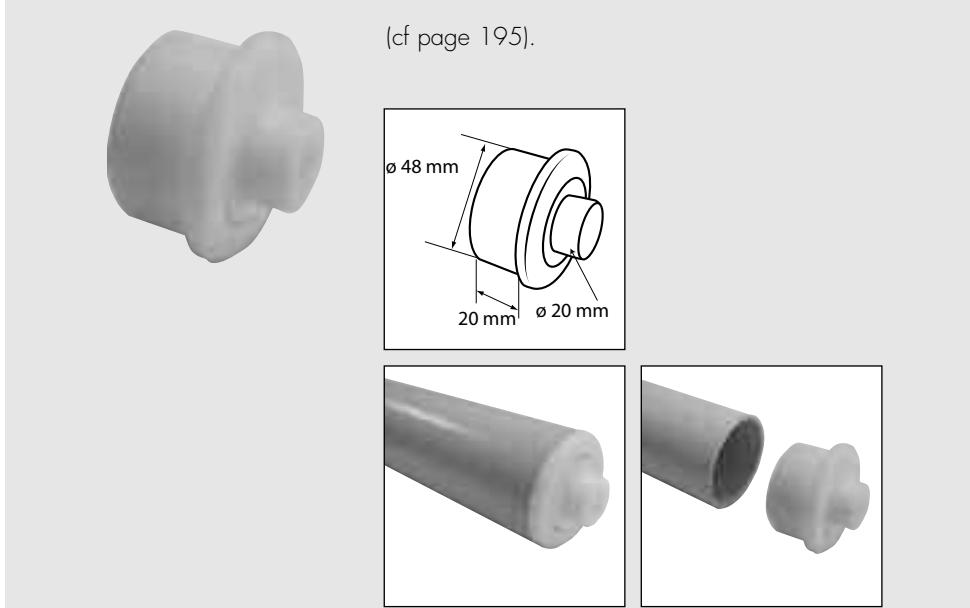
# Rollers

## Standard rollers

**TR-200** Roller length 200 cm – can be cut to length



**BR1** Multifunction connector

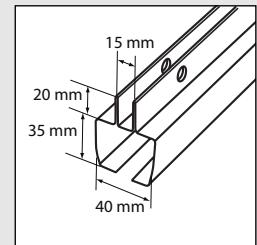
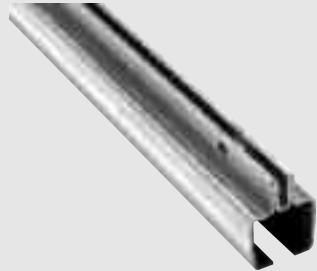


# Conveyors

## Suspended conveyor

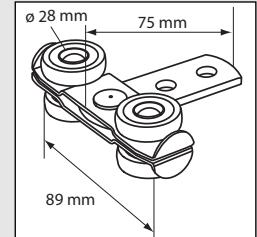
Use monorail conveyors to optimize the work surface. Simple to use, this conveyor configuration is supported by a wide range of accessories. (cf page 194).

### M-400 Monorail



### CM Monorail traveller

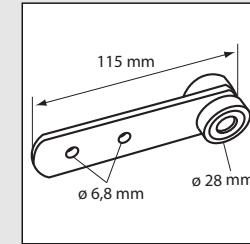
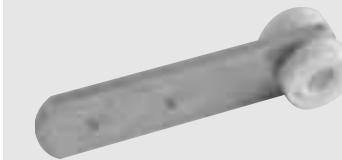
A perfect fit to the monorail system, your products are conveyed smoothly with minimum friction.



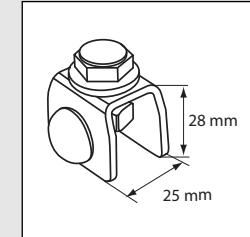
# Conveyors

## Suspended conveyor

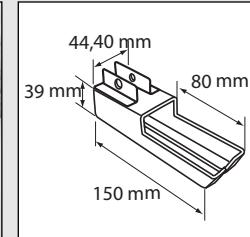
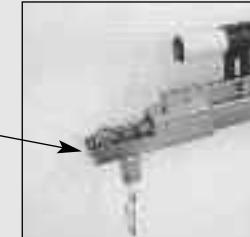
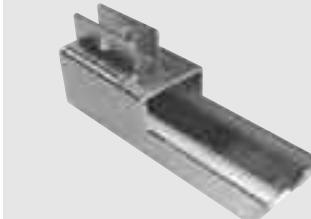
### CM-S Monorail traveller



### BM Monorail endstop



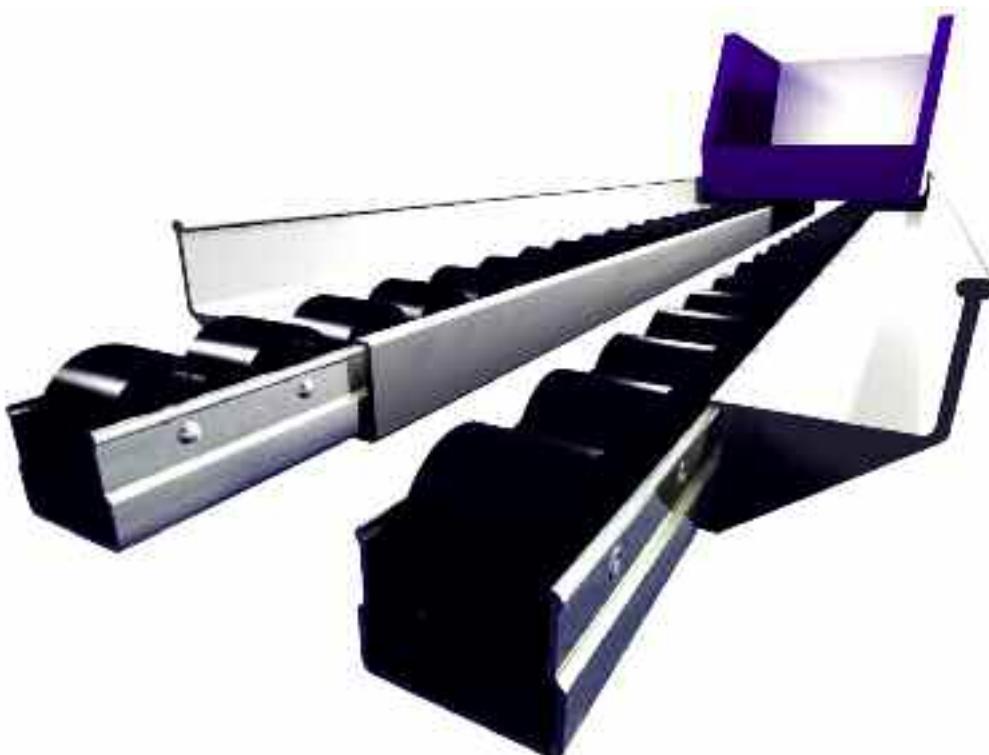
### B-MO



# Accessories

LeanTek® offers you a full range of accessories to expand the breadth of functional applications even further. The lateral and central descent guides are Trilogiq innovations.

Our Label holder strips, castors, floor anchorage systems and special fastenings are all designed specifically to meet the industrial imperatives of flexibility and adaptability.



Lateral guides that slide onto roller tracks for maximum integrity.  
Materials: plastic.

# Accessories

**Length: 400 cm**

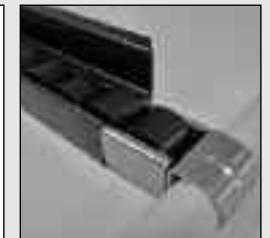
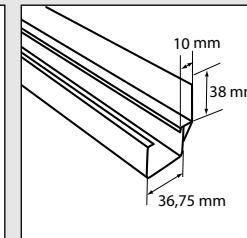
**GL-410 Lateral descent guide with retaining edge 10 mm from the track**



Patent n°: FR 2872495



**GL-410 Esd**



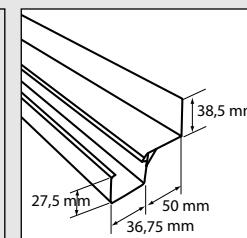
**GL-450 Lateral descent guide with retaining edge 50 mm from the track**



Patent n°: FR 2872495



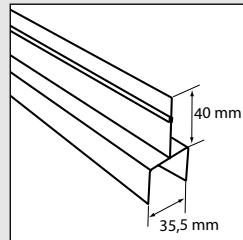
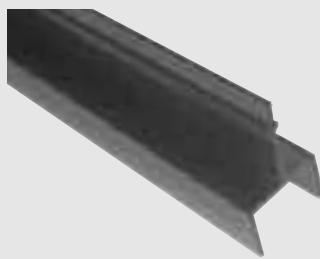
**GL-450 Esd**



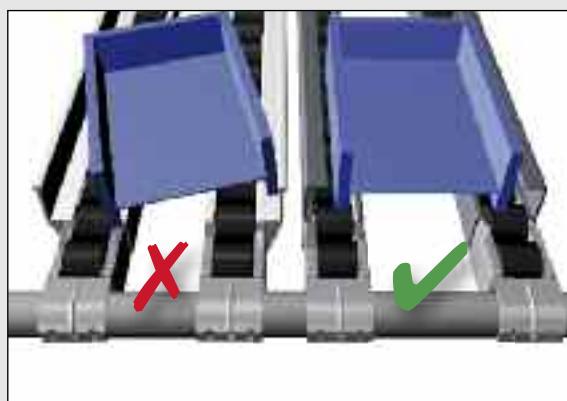
# Accessories

Length: 400 cm

**GC-400 Central guide**



**GL-400 Lateral descent guide for KLT**



Materials: plastic.

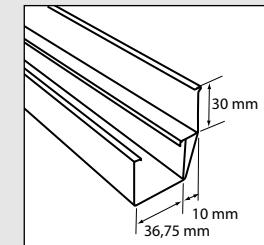
Colours: white

# Accessories

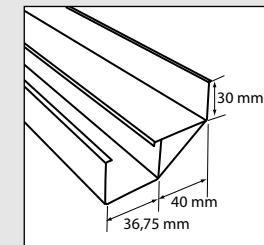
**Plastic guides**

Length: 200 cm

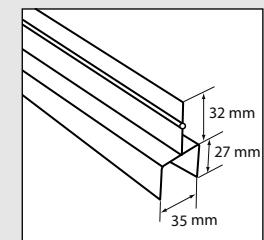
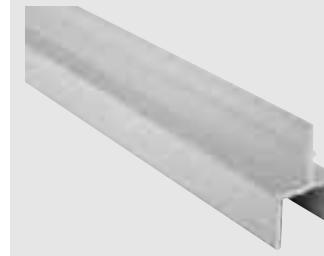
**GL-210 Lateral descent guide with retaining edge 10 mm from the track**



**GL-240 Lateral descent guide with retaining edge 40 mm from the track**



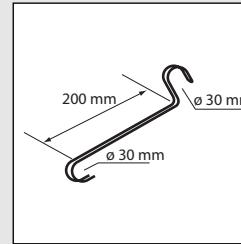
**GC-200 Central guide**



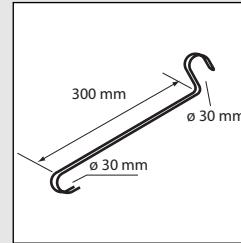
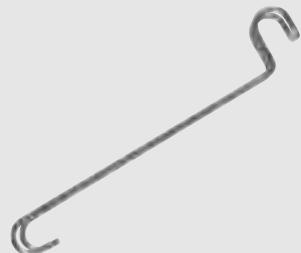
# Accessories

## Picking racks

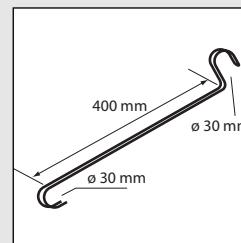
**TF-2 200 mm wire rack**



**TF-3 300 mm wire rack**



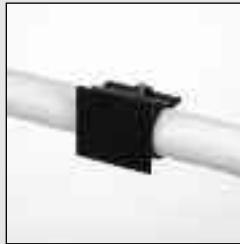
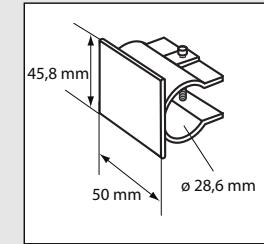
**TF-4 400 mm wire rack**



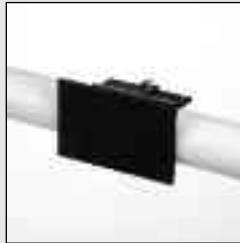
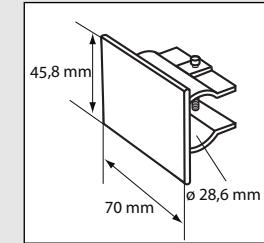
# Accessories

## Label holder strips

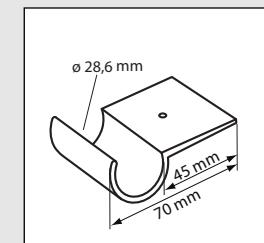
**F6-a Label holder strip (50 mm)**



**F6-b Label holder strip (70 mm)**

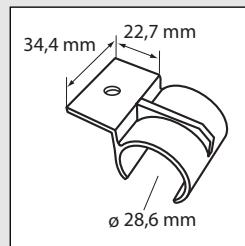


**F-3 Label holder strip and panel support**



# Accessories

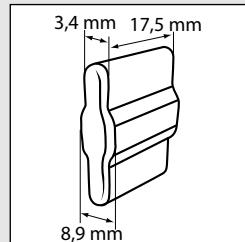
F-9 Plate support



F-10 Safety endcap protection for guides



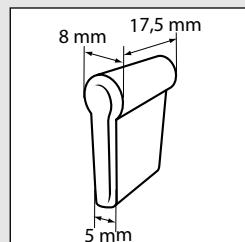
For:  
GC 400 / GL 410  
GC 200 / GL 450



F-11 Safety endcap protection for guides



For:  
GL 210 / GL 240



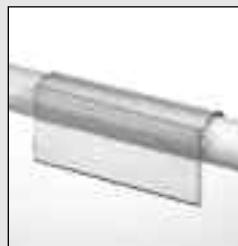
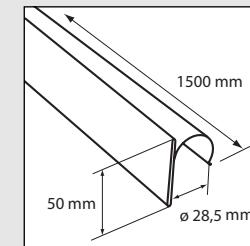
# Accessories

## Label holder strips

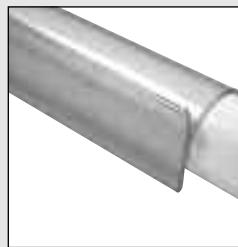
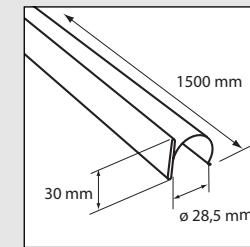
PE-150 Transparent Label holder strip, height 50 mm 150 cm length



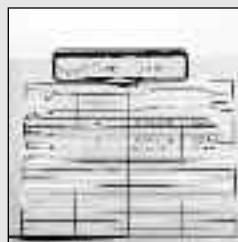
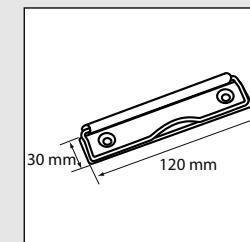
The most popular and practical of label holder strips:  
supplied in 1.5 metre lengths to be cut to length. 50 mm



LH-150 Transparent Label holder strip, height 30 mm 150 cm length



LH-10



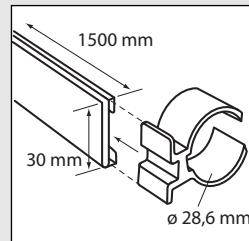
# Accessories

## Label holder strips

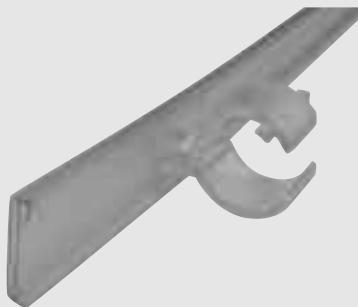
**LS-150 + F5** Transparent Label holder strip, height 30 mm 150 cm length



+



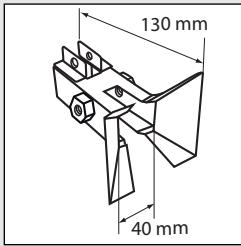
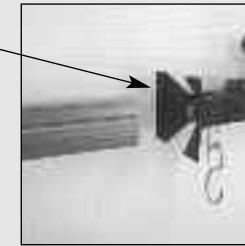
=



F5



**TM-400**



# Accessories

## Shooter monorail

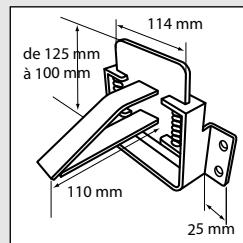
# Accessories

## Shooter monorail

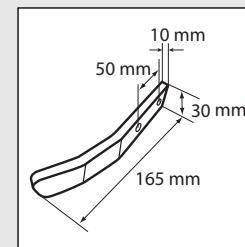
### SH-1 Shooter flowrack



(cf page 181).



### SH-2



Trilogiq offers you a broad range of fixed, pivoting and braked pivoting castors, divided into 2 types:

- Tube castors for lightweight applications
- Plate castors for normal loadings.

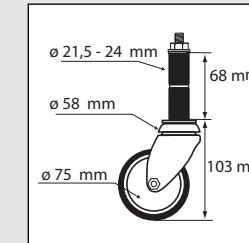
# Accessories

## Tubes castors

### T-75 Ø 75 mm Castors



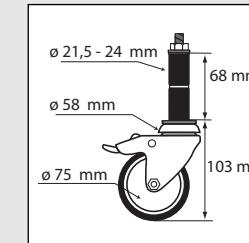
Perfect for smaller applications, these castors will support loads of up to 70 Kg.



### TF-75 Ø 75 mm Castors



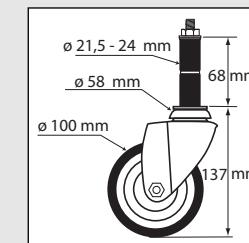
Perfect for smaller applications, these castors will support loads of up to 70 Kg.



### T-125 Ø 100 mm Castors



Standard tube castors. The maximum loading for these castors are 125 Kg.



Option:  
Steel socket for 2 mm tube

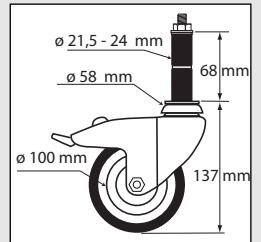
# Accessories

## Tubes castors

**TF-125**

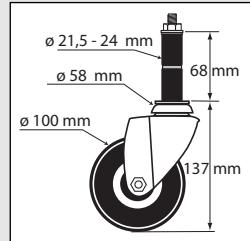
**Ø 100 mm Castors**

Standard tube castors. The maximum loading for these castors are 125 Kg.



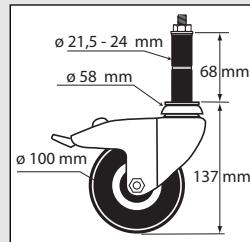
**T-125 ESD Ø 100 mm Castors**

Antistatic tube castors. The maximum loading for these castors are 125 Kg.



**TF-125 ESD Ø 100 mm Castors**

Antistatic tube castors. The maximum loading for these castors are 125 Kg.

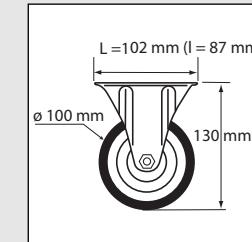


# Accessories

## Plate castors

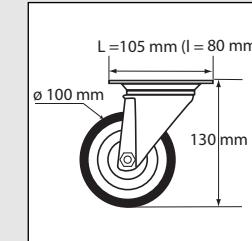
**P-125 Ø 100 mm Castors**

Standard Plate Castors. The maximum loading for these castors are 150 Kg.



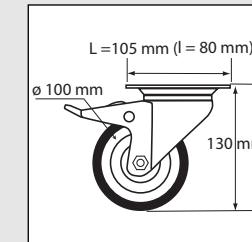
**PP-125 Ø 100 mm Castors**

Standard Plate Castors. The maximum loading for these castors are 150 Kg.



**PPF-125 Ø 100 mm Castors**

Standard Plate Castors. The maximum loading for these castors are 150 Kg.



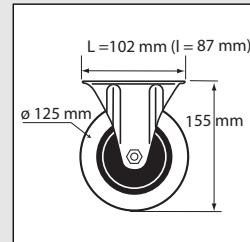
# Accessories

## Plate castors

### P-200 Ø 125 mm Castors



Plate Castors. The maximum loading for these castors are 200 Kg.

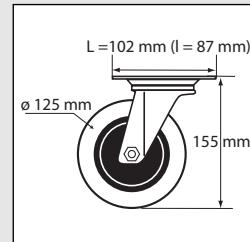


Adaptable for use with MB-P (hand pushed metal-base trolleys).

### PP-200 Ø 125 mm Castors



Plate Castors. The maximum loading for these castors are 200 Kg.

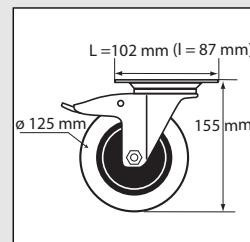


Adaptable for use with MB-P (hand pushed metal-base trolleys).

### PPF-200 Ø 125 mm Castors



Plate Castors. The maximum loading for these castors are 200 Kg.



Adaptable for use with MB-P (hand pushed metal-base trolleys).

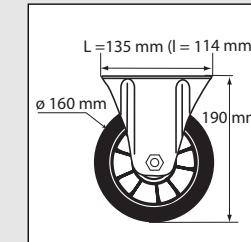
# Accessories

## Castors for Metal-Base® trains

### MB-160 Ø 160 mm towable castors - Fix



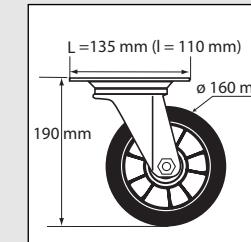
Adaptable for use with MB-P. 300 kg.



### MB-160P Ø 160 mm towable castors - Swiveling



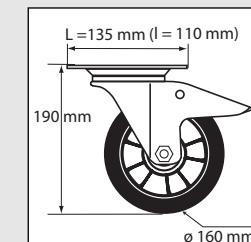
Adaptable for use with MB-P. 300 kg.



### MB-160F Ø 160 mm towable castors - Swiveling brake



Adaptable for use with MB-P. 300 kg.

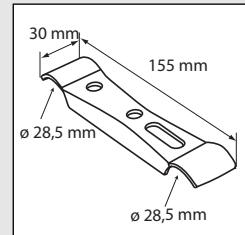


# Accessories

## Castor accessories

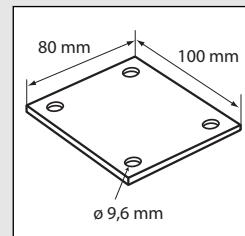
### F-P Plate castor fixings

Secured using S5 screws.



### PI-10 Plate castor fixings

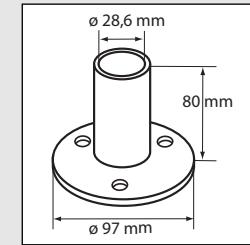
Secured using S5 screws.



# Accessories

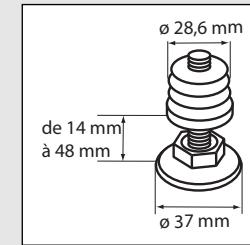
## Feet

### PS-M Metal stud plate



### P-A Standard adjustable foot

Also exists in Esd: P-A Esd.

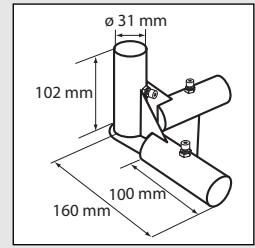


# Accessories

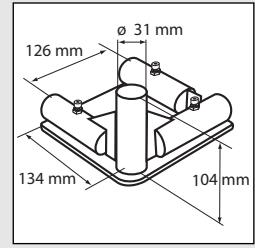
## Tube bases

Our LeanTek® product range includes plates specially designed to reduce fitting time at the same time as improving structural rigidity.

### DM-100 Reinforced 3-tube junction

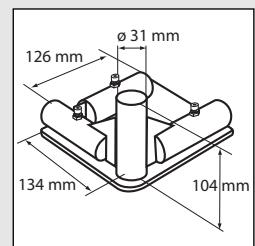


### YB-L Reinforced plate (left)



### YB-R Reinforced plate (right)

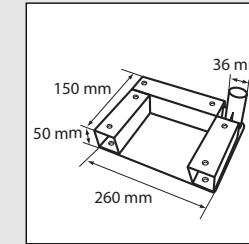
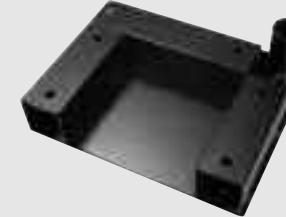
Although specially designed to reinforce the corners of mobile racks, these plates can also be used with feet.



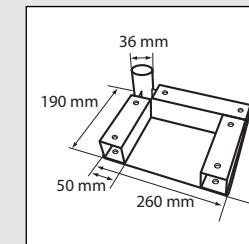
# Accessories

## Self tracking base

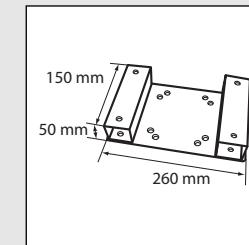
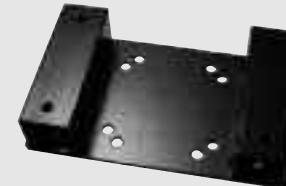
### SG-1



### SG-2



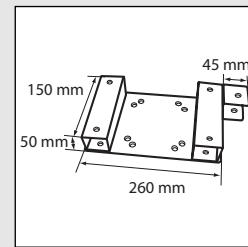
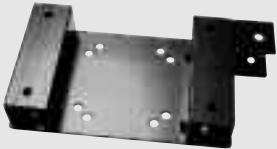
### SG-3



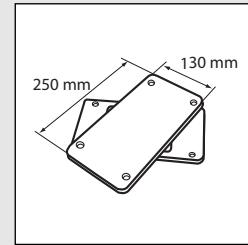
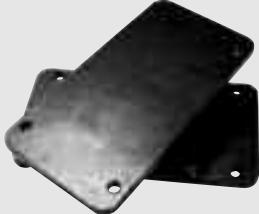
# Accessories

## Embases auto-tracantes

**SG-4**



**SG-R**



# Modular towable base fram®

Mounting point for tubular structure.

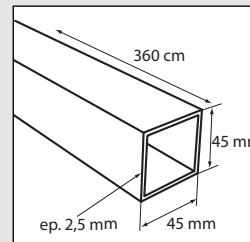


# Modular towable base frame®

## MB-400



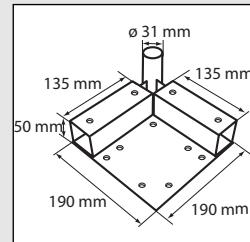
45 x 45 steel profile  
Th. 2.5 mm, black zinc finish, L 360 cm.



## MB-P



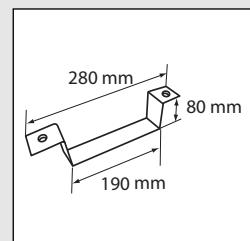
Metal Base multi-function corner component, with black zinc coating, and designed to accept LeanTek® tube.



## MB-PF



Forklift guide for secure and easy transport.

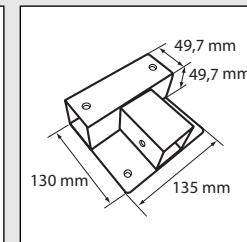
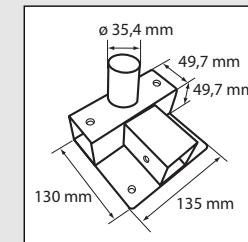


# Modular towable base frame®

## MB-PIT



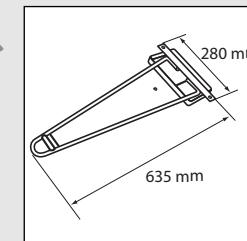
Also exist in version without tube support.



## MB-T500



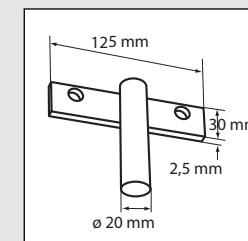
Front drawbar, towing capacity 500 kg.



## MB-TR



Rear drawbar coupling for MB-T500.

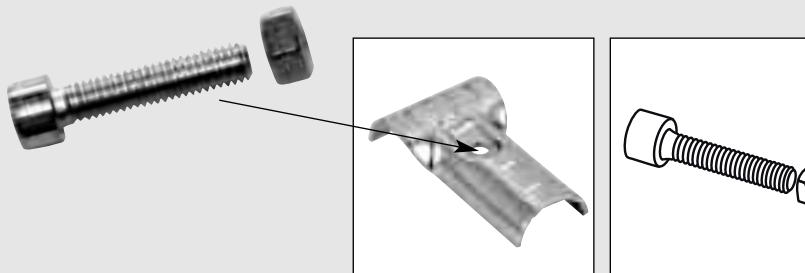


# Accessories

## Fastenings

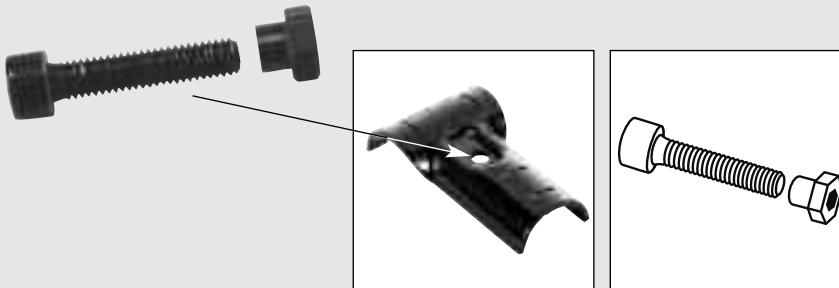
### S1 ESD screw - M6x28

ESD Connection.



### S1 M6x28 screw

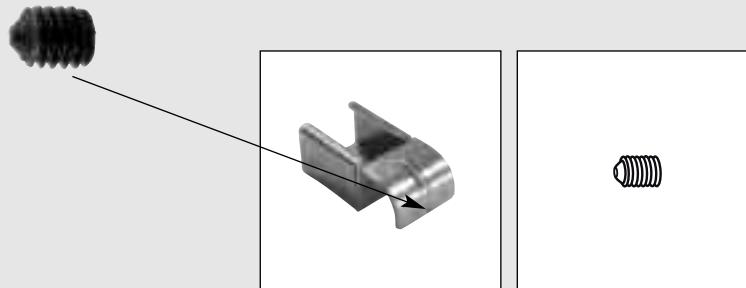
Connections.



### S2 - Cone point set screw

#### M4x5

Used to secure F-M1 Types multifunction connectors.

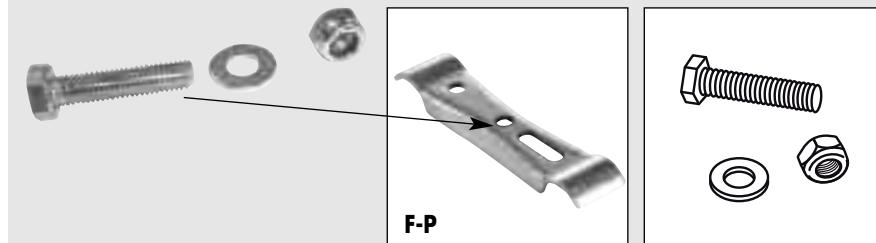


# Accessories

## Fastenings

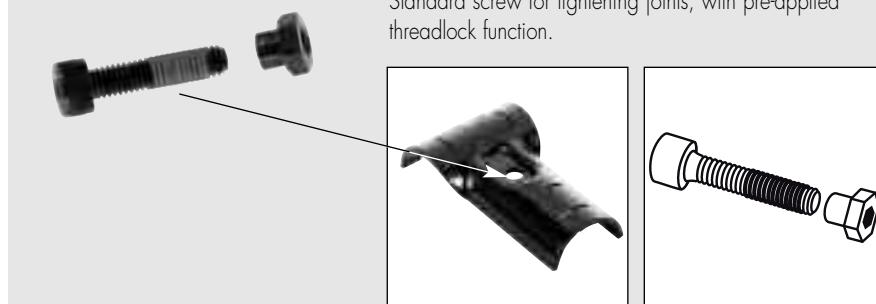
### S3 M8x40 screw

Used to secure plate castors in combination with the F-P component.



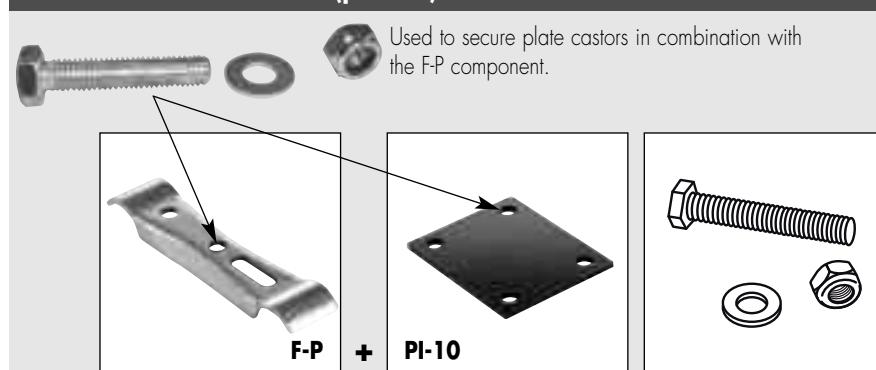
### S4 M6x28 screw

Standard screw for tightening joints, with pre-applied threadlock function.



### S5 M8x45 screw (pour PI)

Used to secure plate castors in combination with the F-P component.



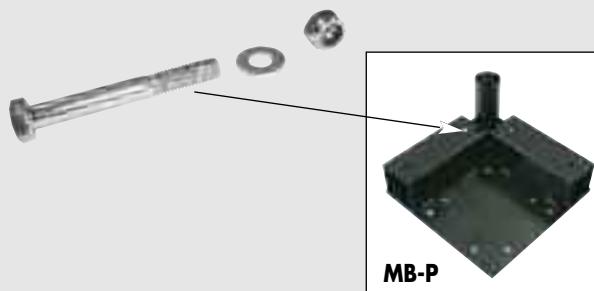
# Accessories

## Fastenings

**S6**

### screw for assembling Metal-Base® components

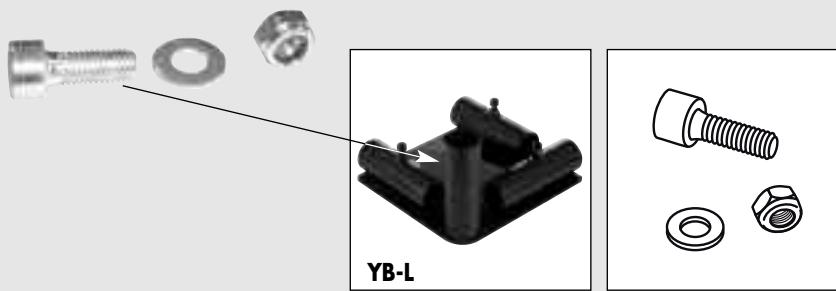
Standard screw/nut combination.



**S7**

### M8x20 screw

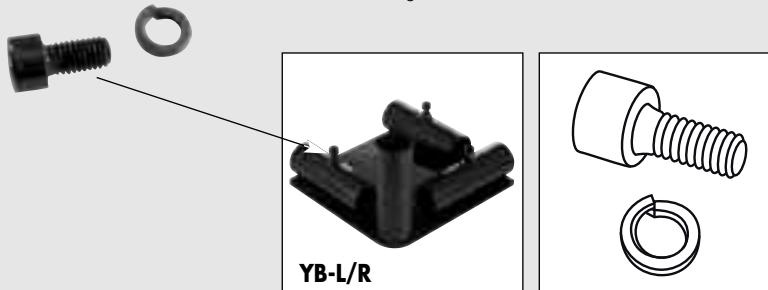
Screw for fitting plate casters on YB-L/R and Metalbase® corners.



**S8**

### M6x12 screw

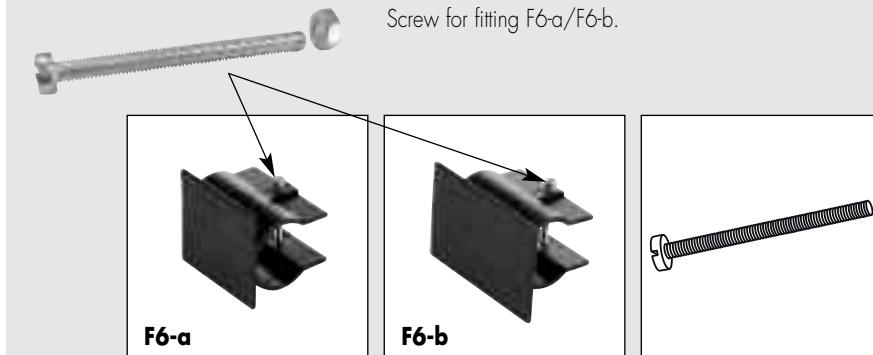
Screw for fitting a tube to YB-L/R.



**S9**

### M3x35 screw

Screw for fitting F6-a/F6-b.



# Accessories

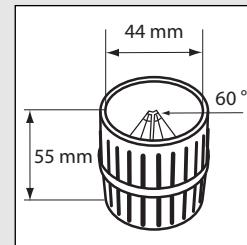
## Tools

Our LeanTek® product range also includes additional tools The BTR key and Bandsaw.

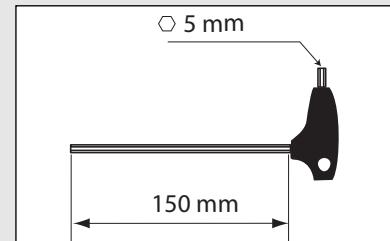
### Deburring tool 001



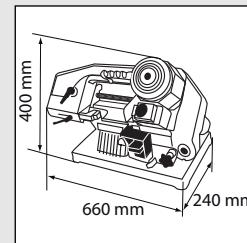
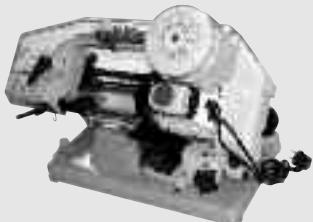
Internal/external deburring tool.



### BTR Key for S1 and S4 screws



### Bandsaw



## Flexible design AGC

### Trilogiq AGC: MOVE



The Trilogiq tubular AGC is an extremely efficient, flexible and modular answer to the need for automatic driverless transport of products in factories and workshops.

The Trilogiq AGC is remarkable for its flexibility: it is guided by magnetic strips glued to the floor. This provides unequalled flexibility in terms of configuration of routes and changes in routing. Designed and assembled according to Japanese principles of Just In Time around 3 mechanical and electronic principles, the Trilogiq AGC is constructed with a LeanTek® structure customised to your application. This structure can be easily adjusted, customised or dismantled and reused.

Within the 4 types of AGC applications the infinite number of variants is limited only by the imagination. The Trilogiq AGC principle fits into the "Lean" philosophy: the elimination of the transport Muda by accelerating the rates of delivery and reducing the cost of the transport itself. Small packages, no driver, simplicity and reliability.

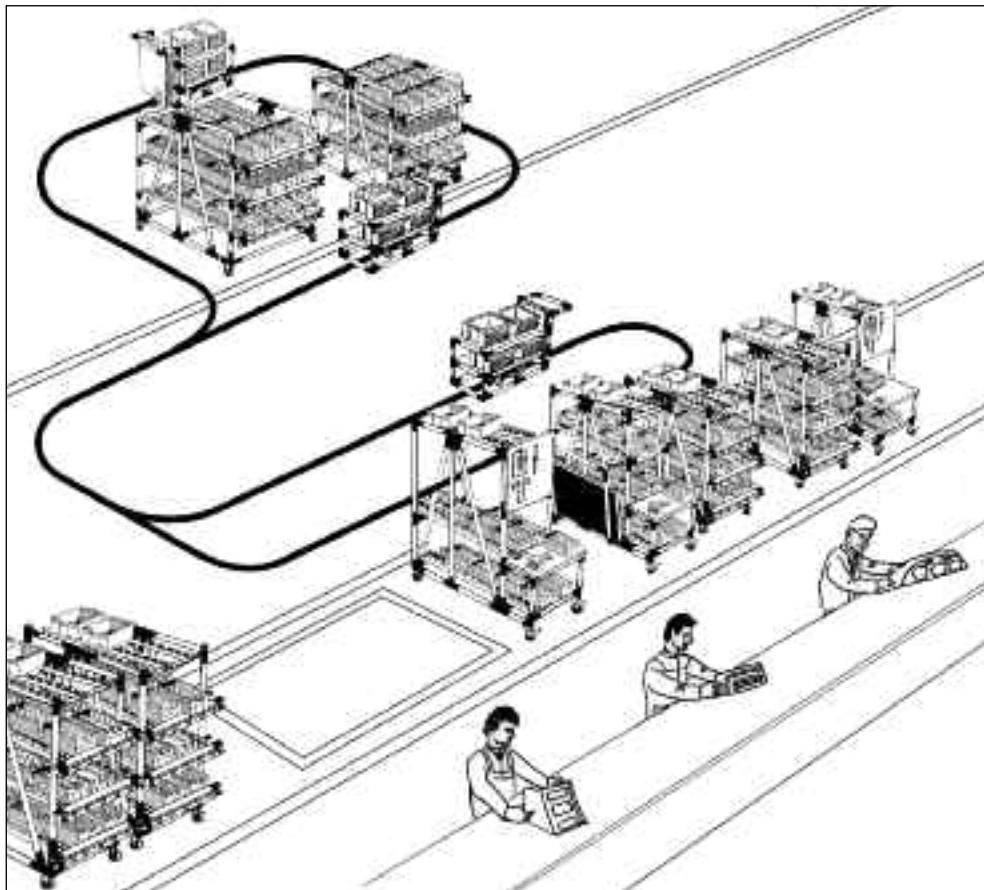


## **Application 1: Transport of parts and components between supermarkets and the line side**

### **Automatic AGC:**

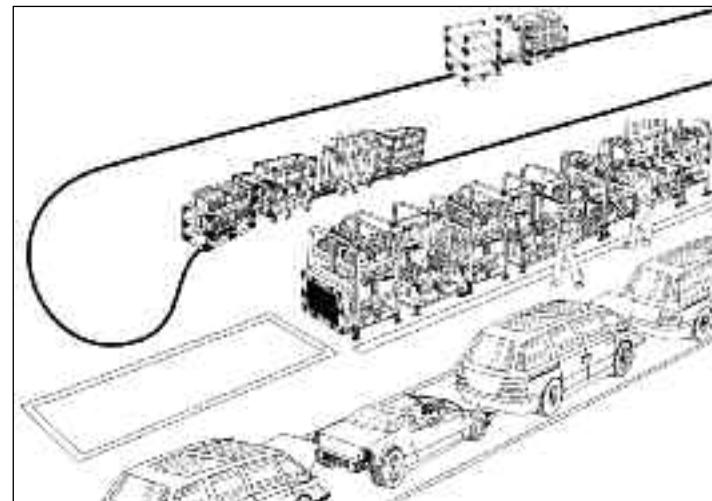
- Direct transport of parts from the supermarket to the line. Thanks to its LeanTek® superstructure the AGC can be configured to transport either small boxes or an assembled sub-component.

**Configurations:** Direct or train transport.

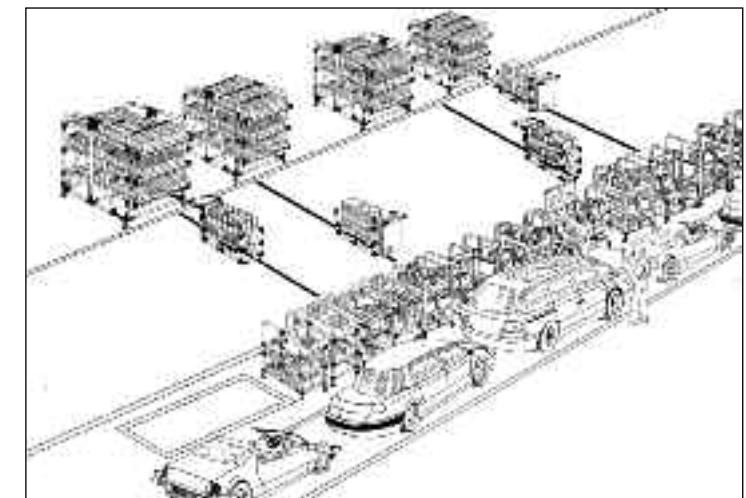


### **The AGC in the train mode:**

Supply to the line side by the railway principle. The AGC tows Trilogiq wagons. These wagons can be configured to meet your specific requirements due to the flexibility of LeanTek®.

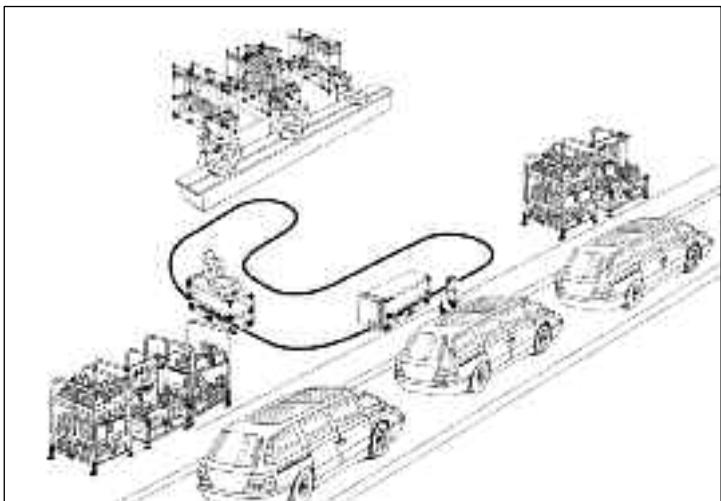


Supermarket / line supply in the return mode.  
In this case the route is not a loop but a single path that the AGC covers in both directions.



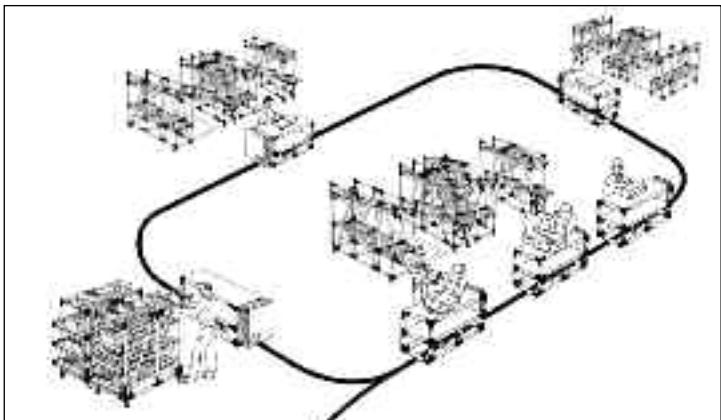
## **Application 2: Transport of sub assemblies from line to line**

The AGC is used as a transport and supply system from a sub assembly line to the main line.



## **Application 3: AGC as an assembly line**

It is sometimes useful to create an assembly line consisting of AGCs: rather than rigid and costly conveyors, a line made from AGCs is very flexible and easy to install, to move or to modify.

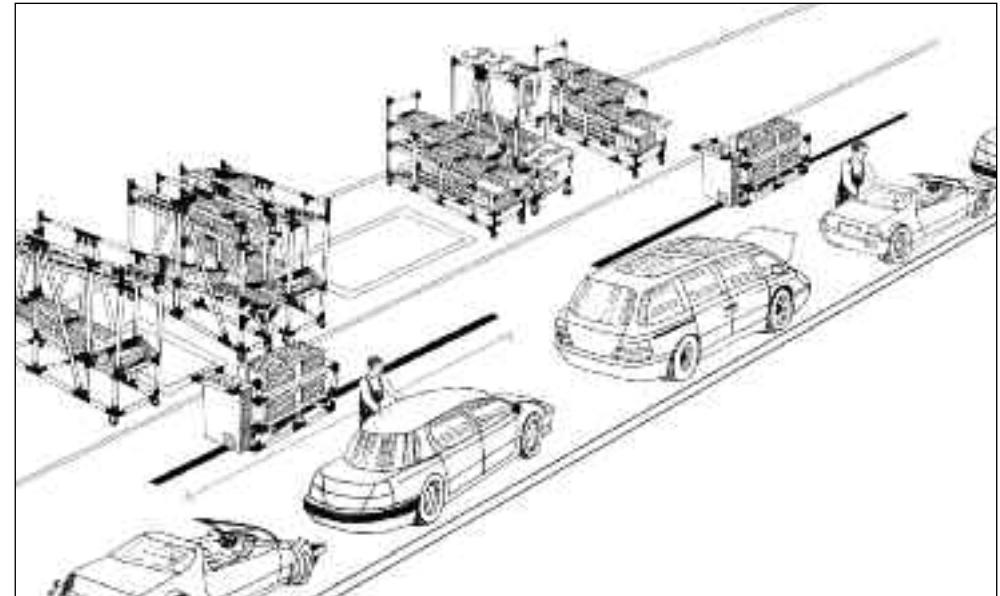


The AGCs are then configured as work stations and they can be recycled into any other function if the line changes or ceases to exist.

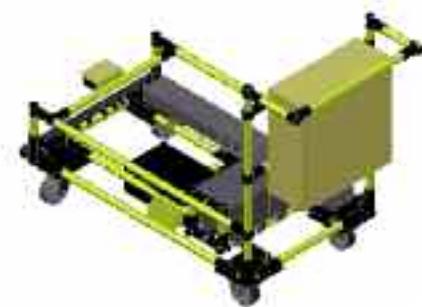
## **Application 4: On-board service trolley**

The AGC is used to follow the product as it moves along the line. It then returns to its initial point for the next product.

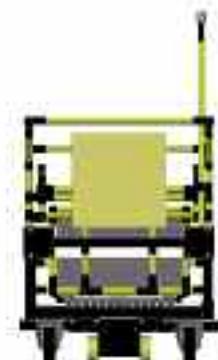
The great advantage of this system is the ease of installation and adjustment of the AGC compared to conventional solutions with heavy infrastructures.



# The customised AGC

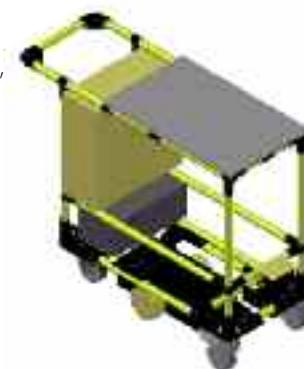


The choice of the LeanTek® system for configuring Trilogiq AGC structures provides unequalled customisation possibilities and flexibility.

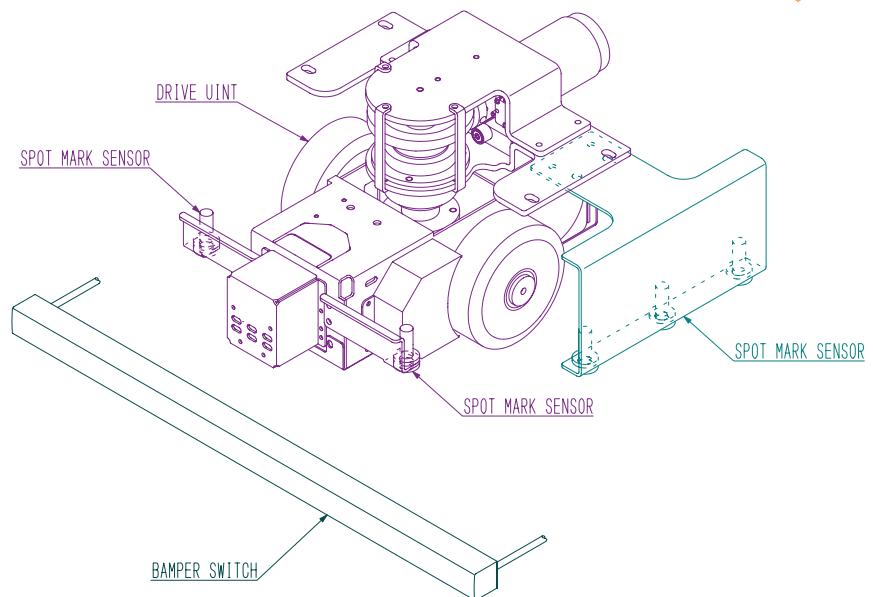
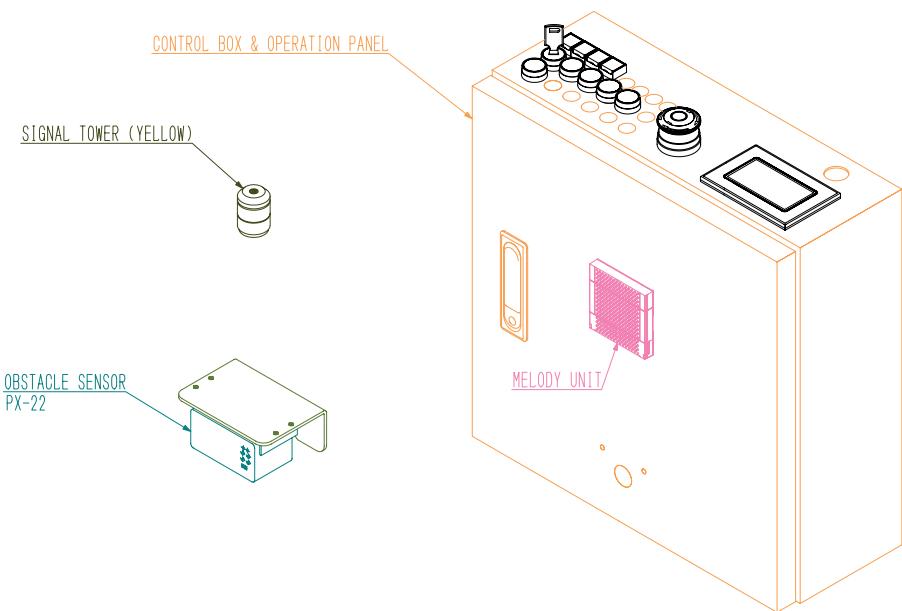


The Trilogiq technical centre is capable of sizing the AGC exactly to your needs: length, width, height, position, sizing of safety components and positioning of components, etc.

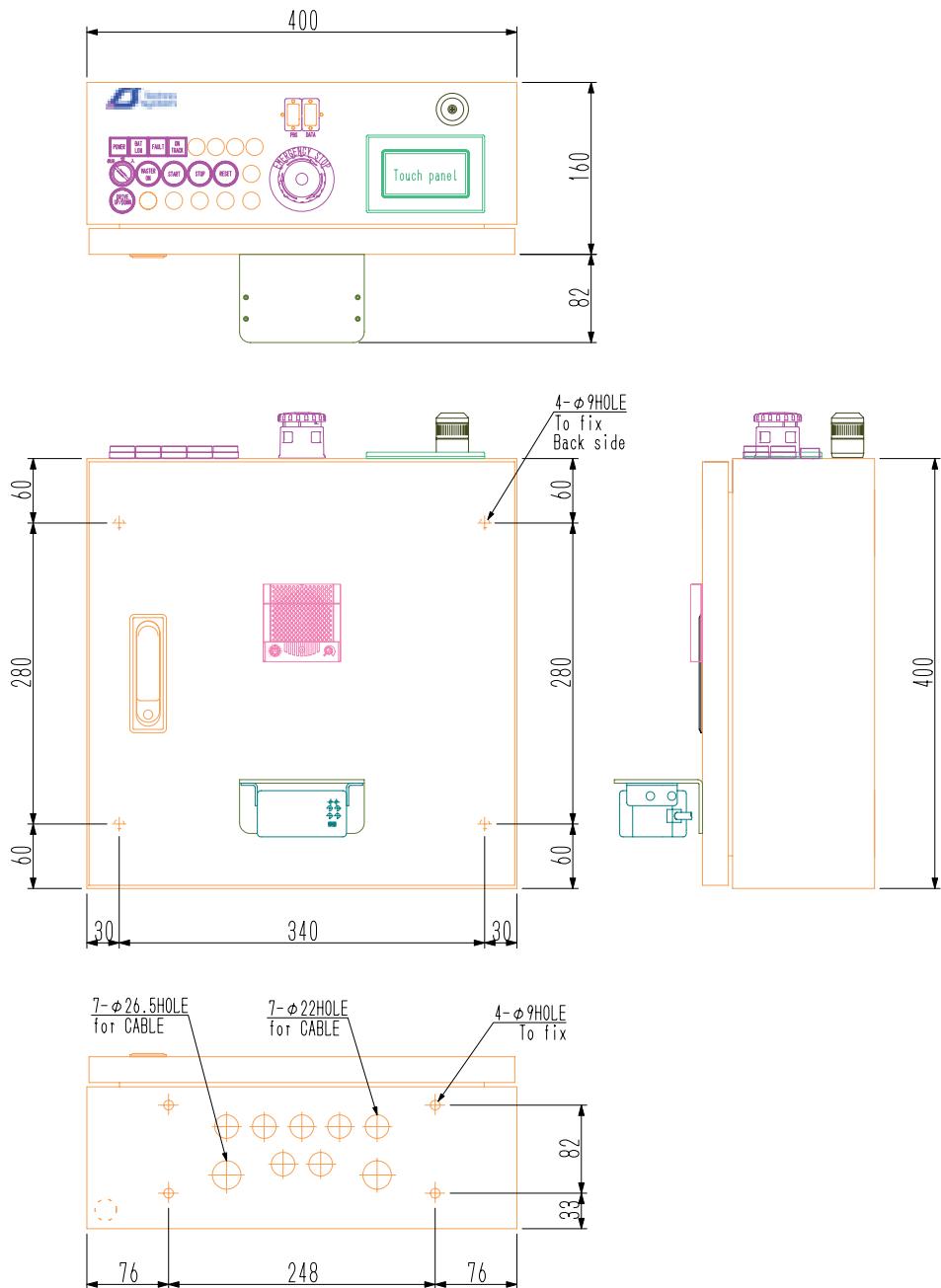
Anything is possible.



# Main components



# Main components



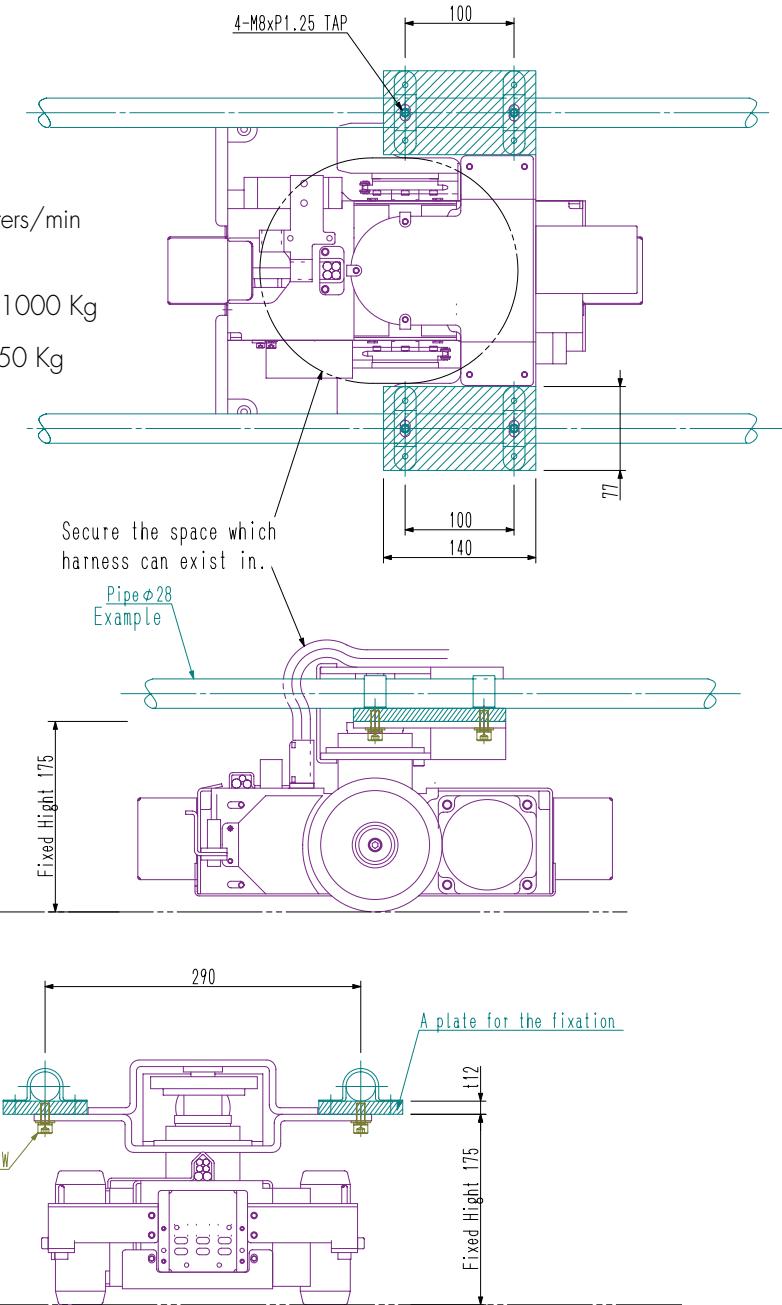
# Characteristics

**Speed:** : 3 to 50 meters/min

**Acceptable load:**

- 400 Kg - 750 Kg - 1000 Kg

**Weight of the AGC:** 50 Kg



# Product range

## 3 Types:

### Type 1 AGC

- Stops at marker positions on ground
- Fixed travelling speed
- Starts with operator pushing button.

### Type 2 AGC

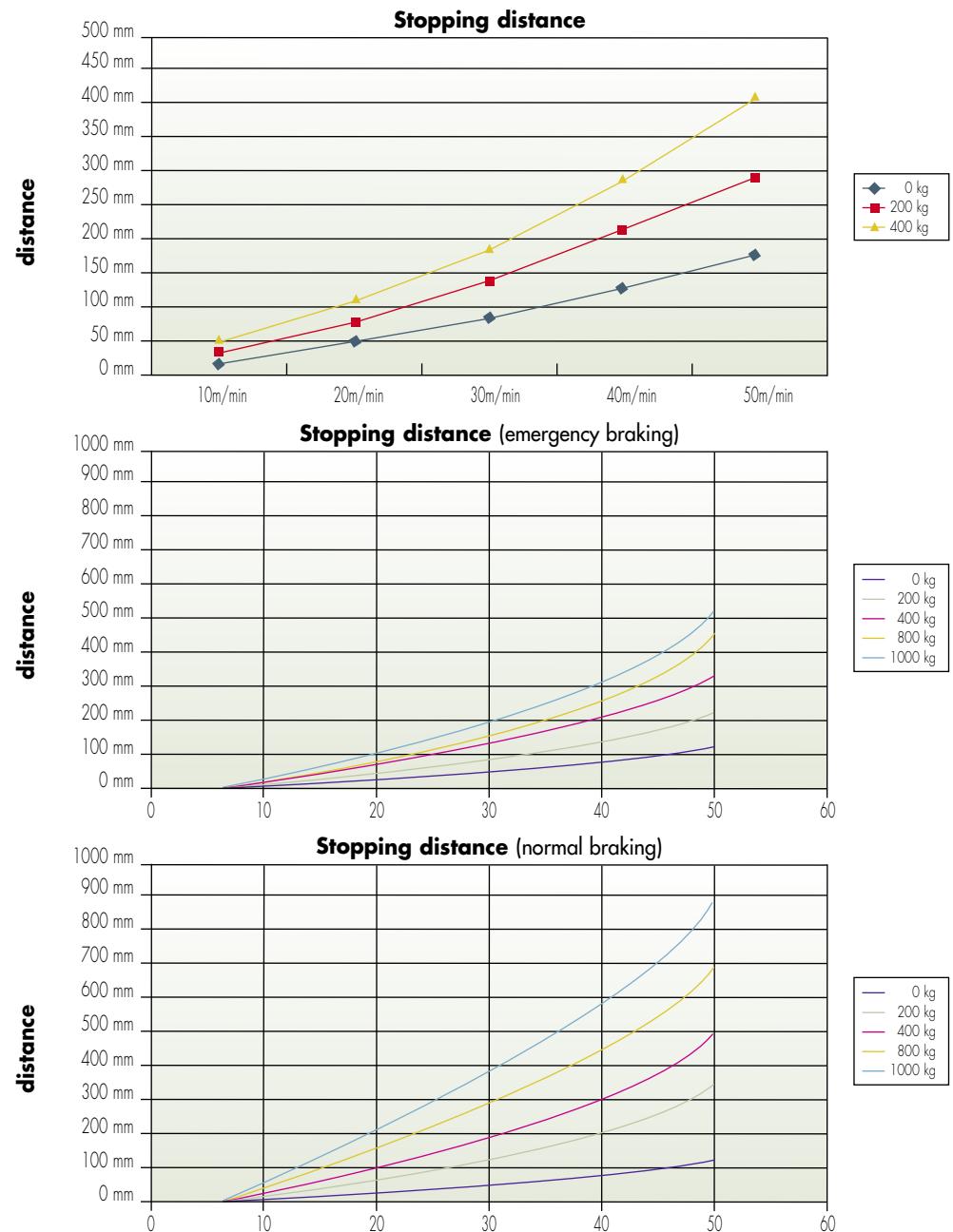
- Stops at marker position on the ground.
- 3 Variable speed between the tags
- Starts with operator pushing the button
- Simple turning control (Left / right turn)

### Type 3 AGC

- Intersection management (turning left / right)
- Programmable stop time with automatic start.
- Speed changes 3 to 50 m/min) between tags
- Zone changes on programmable obstacle sensor
- Melody activation / cancellation
- Raising and lowering the carriage pick up hook (pin hook)
- Multiple programmable paths
- Communication between AGCs at cross over points
- Starting/stopping by remote control
- Automatic loading / unloading



# Stopping distance

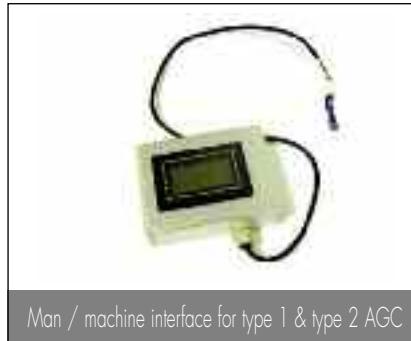


# Accessories

# Accessories



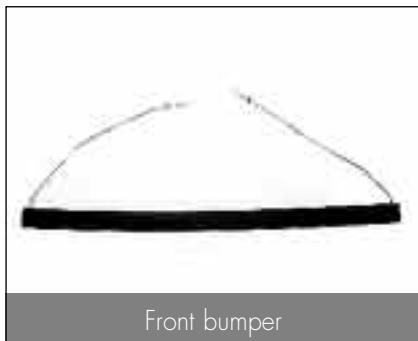
Motor unit



Man / machine interface for type 1 & type 2 AGC



Programmable obstacle sensor



Front bumper



Standard obstacle sensor



Tag reader for type 2 AGC



Pin hook



Light



Laser Area scanner safety sensor



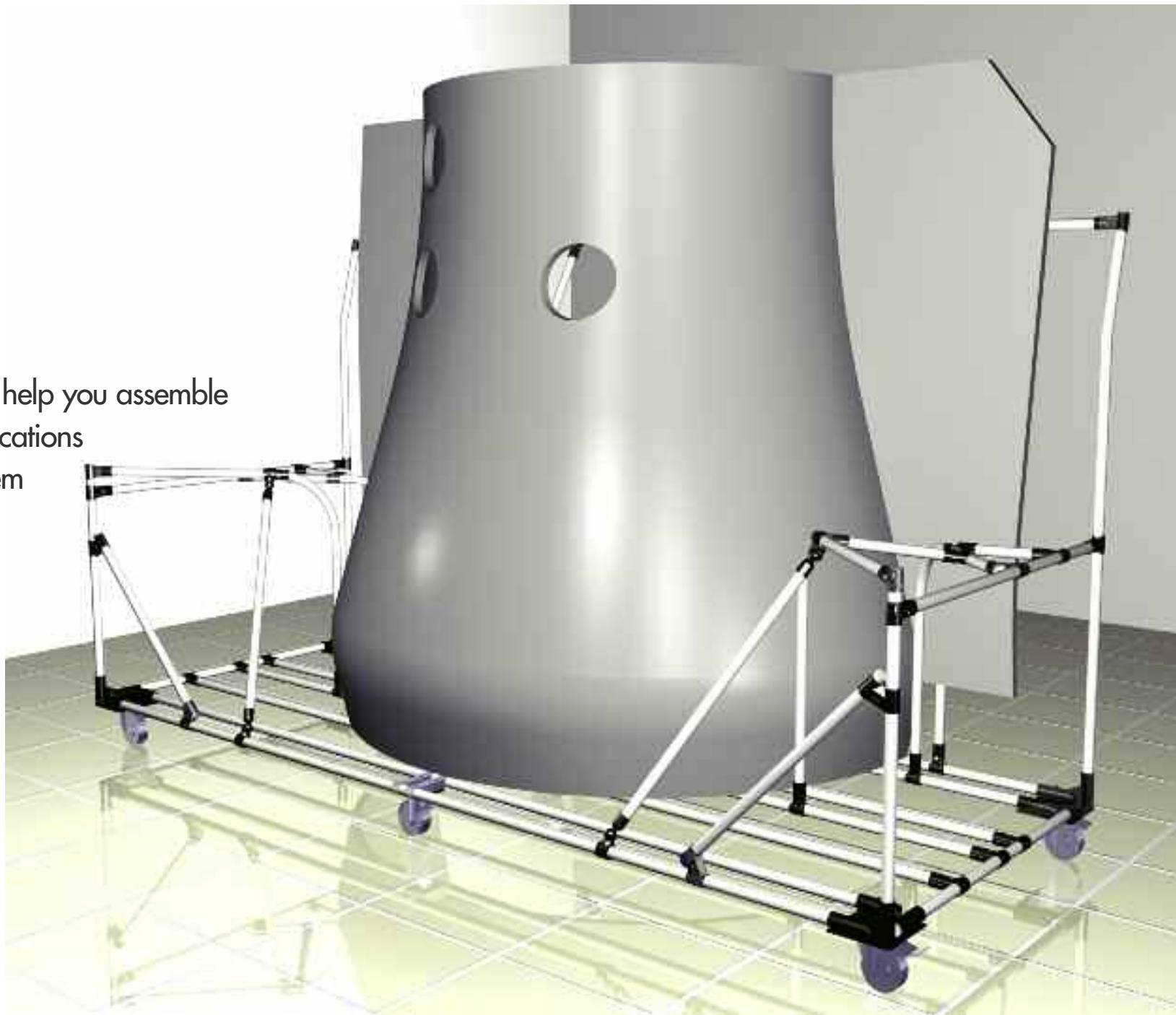
Remote control receiver control box



Remote control transmitter

## Help with assembly

Some simple tips to help you assemble your LeanTek® applications faster and make them even stronger.



# The 4 golden rules of assembly

## ■ Rule 1

**Support roller tracks at least every 150 cm**



No

No support = risk of bending.



Yes

With support = robust and durable.

## ■ Rule 2

**Cut to the right length and fit the tube to the endstop of the joint**



No

A tube cut too short reduces grip by 50%.



Yes

Fit the tube to the endstop.

# The 4 golden rules of assembly

## ■ Rule 3

**Never assemble dynamic racks wider than 150 cm without support**



No

Rack too wide = risk of bending.  
Maximum width: 150 cm.



Yes

2 smaller applications offer better durability.

## ■ Rule 4

**Fit diagonal bracing**



No

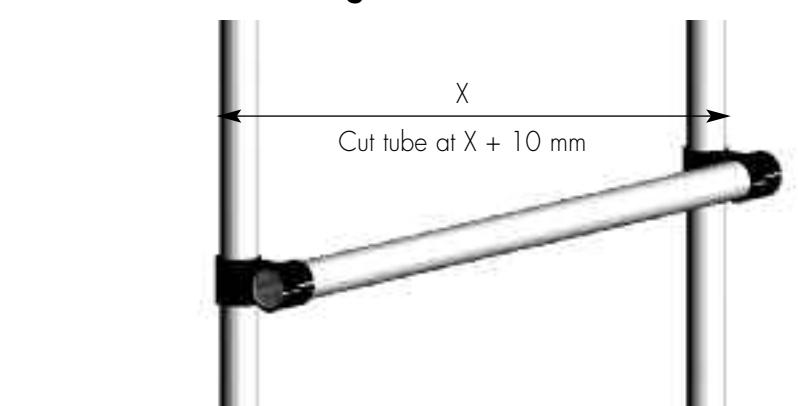
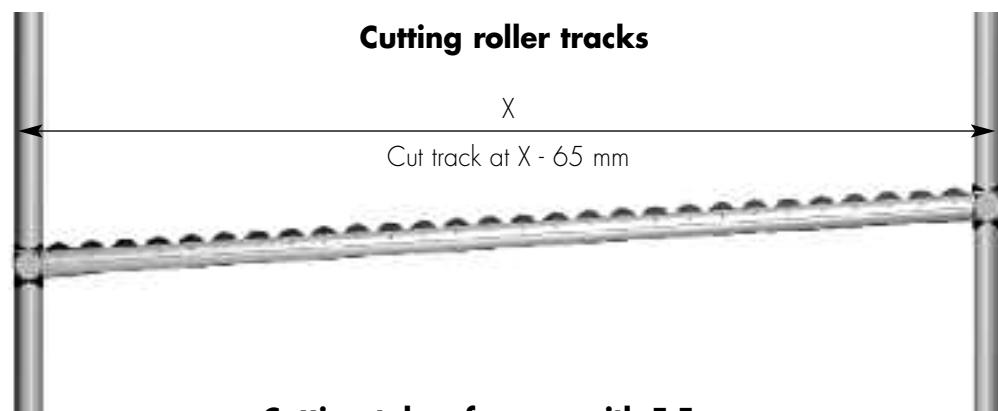
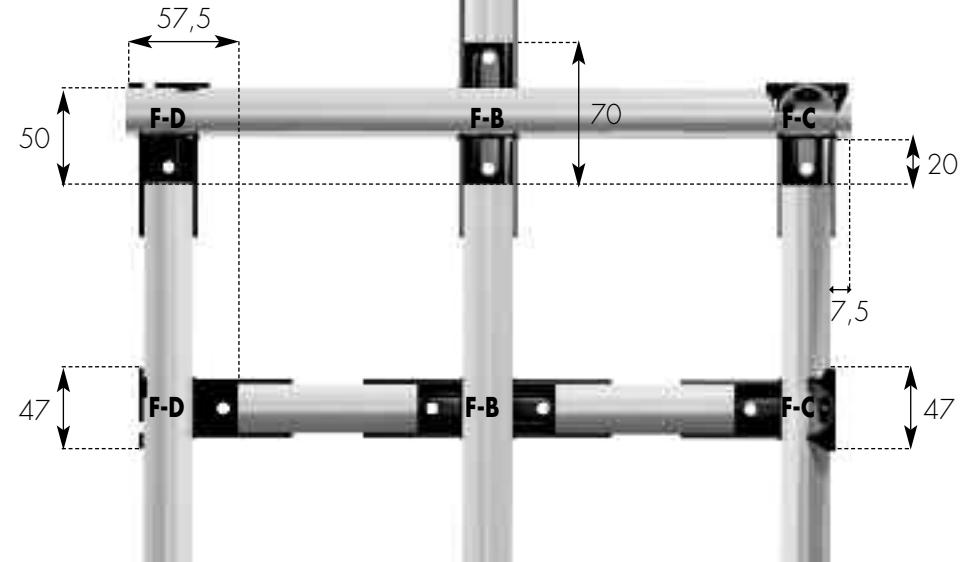
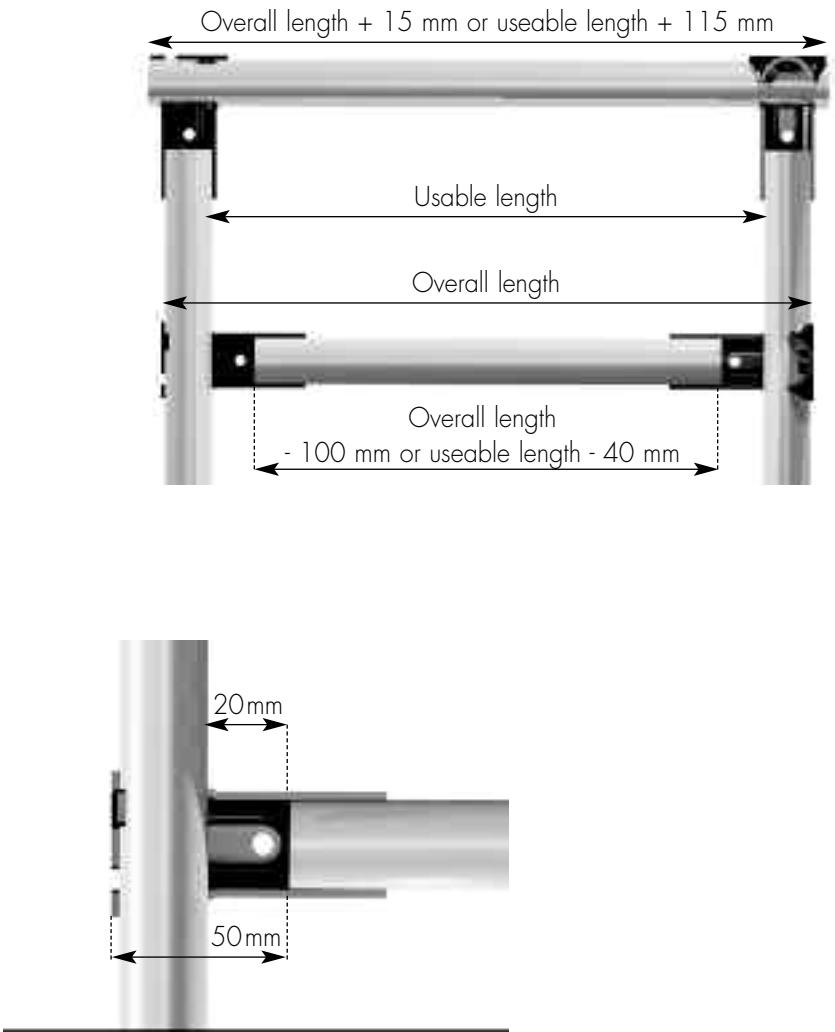
Without diagonal bracing = risk of the application moving out of square = risk of connectors coming apart.



Yes

With diagonal bracing = application keeps its original shape = durability.

# Rules for cutting tubes and roller tracks



# The stages in assembling a mobile flow rack

## Standard dynamic rack - 4 assembly stages

### Stage 1

Construct the base.



### Stage 2

Fit the sides.



### Stage 3

Fit the lateral tubes/  
roller track supports.



### Stage 4

Insert roller tracks.



# Assembly of a Metal-Base® cart

Reinforced bases are quick  
and simple to construct:



Cut the MB-400 tubes to the desired length,  
establish the corresponding hole pattern of  
the MB-P, and drill the tubes accordingly.



Screw the MB-400 profile to the MB-P base  
with the M8 bolt and nut set.



Add the optional accessories: front drawbar,  
rear coupling, fork lift guide.



Assemble the tubular LeanTek®  
superstructure on the Metal Base.



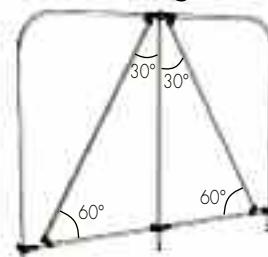
Possible applications: flow racks,  
inventory containment, material transport.

# Reinforcing applications – Diagonal bracing

Reinforcement becomes a necessity in applications subject to significant levels of impact and loading. LeanTek® offers a range of products specially designed to perform under severe loading conditions, including 2 mm tubes, Metal-Base® bases and roller tracks on reinforced profiles. There are 2 main ways of reinforcing an application:

- In terms of the structure: by increasing the number of diagonal braces (components F-F, F-G, F-K, F-L, F-L30 and F-L60)
- In terms of the roller tracks: by increasing the number of tracks or using reinforced tracks (RT-400 and LW-400).

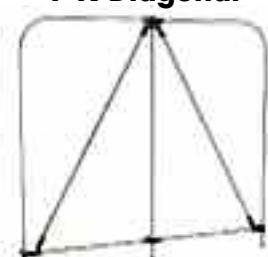
**FL-60 Diagonal**



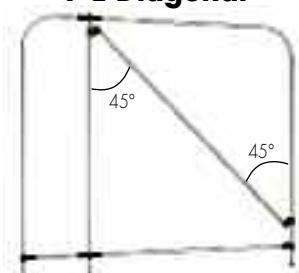
**F-F Diagonal**



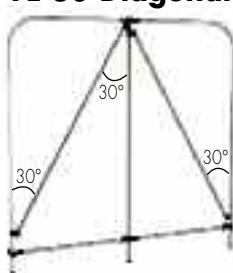
**F-K Diagonal**



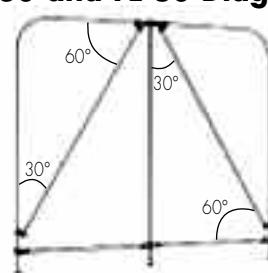
**F-L Diagonal**



**FL-30 Diagonal**



**FL-30 and FL-60 Diagonal**



# Special shapes

**Using the F-T and F-G joints**



Using F-G connector joints in conjunction with F-T connectors allows tubes to be connected end-to-end to create any angle. This makes it possible to create work surfaces in special shapes and corner racks.

## Tube doubling



Where load strength is required, the F-L component allows tube doubling to take the strain.

# Functional Guide

From product to function:  
how LeanTek® components  
can help you in your  
Lean Manufacturing  
strategy.



# Ergonomic picking units

Front picking is vital in eliminating the muda caused by waiting, processing and unnecessary movement. The LeanTek® system lets you create an infinite variety of picking units.

Here are the 4 main types.

## The standard stop



- The standard stop

This is the simplest solution for supermarket and work-in-progress storage racks.

## The sloping rack



- The sloping rack

This rack is also quick to assemble, but the ergonomic arrangement at the front slopes towards the operator, making picking easier. This solution requires the structure of the rack to be designed at an incline. A combination of LeanTek® components F-F, F-T and F-G are used to create the required angles. (cf page 78-79-82)

- The T rack

This system is original to LeanTek® and uses a space into which the container tips forwards in an inclined position, held between the inner and outer tubes. Moving the outer tube up and down adjusts the gradient to angle required to accommodate the configuration of container used. The T rack provides the steepest gradient possible within a traditional rack design.

## The T rack



- The traditional rack

This is the traditional solution seen in most applications.

## The traditional rack



# Reinforced metal bases

For wheeled and mechanically-transportable racks subject to extreme loads, Trilogiq offers the modular Metal-base® system.

This is the ideal system for constructing reinforced bases for trolleys and flow racks.

**2 identical bases with different superstructures.**



Flow rack protected by a Metal-Base® base suitable for forklift handling.

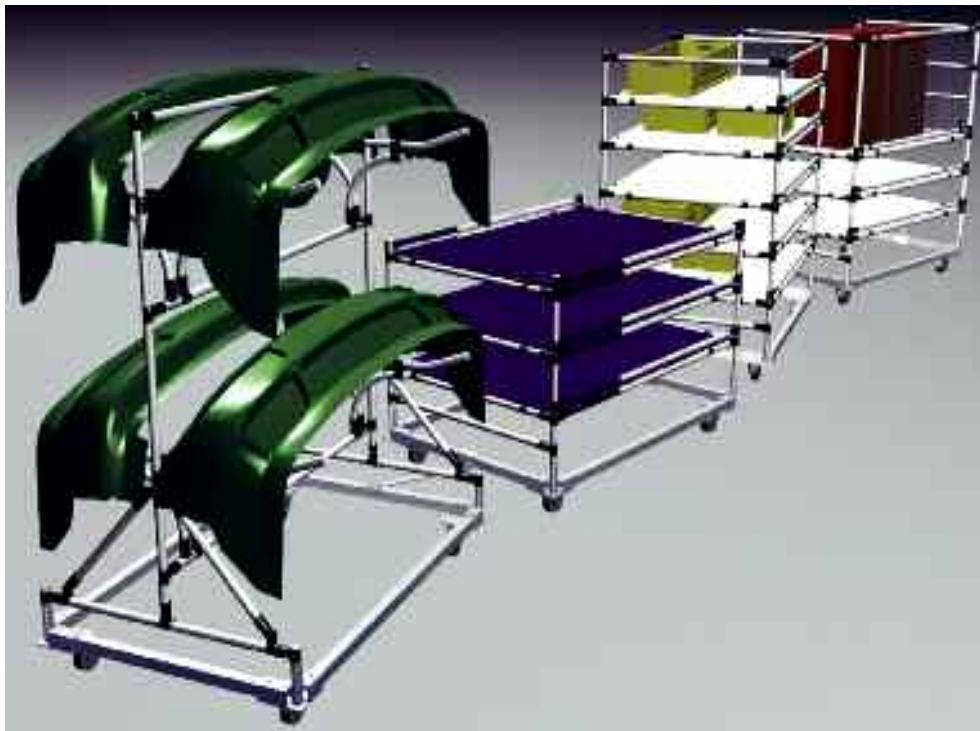


The Metal-Base® system can be used to construct extremely strong bases without the inconvenience of rigidly welded systems. (cf pages 135-137)

# Small trains and wagons

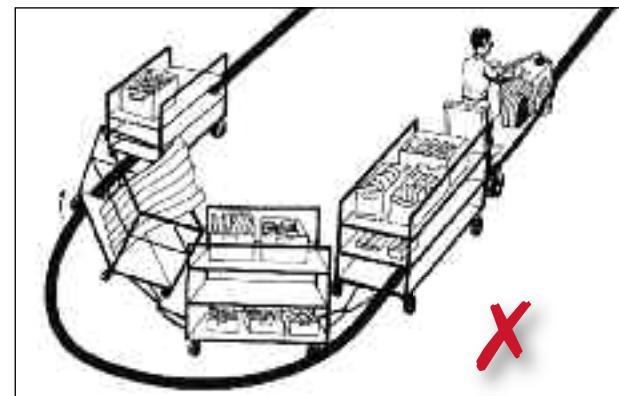
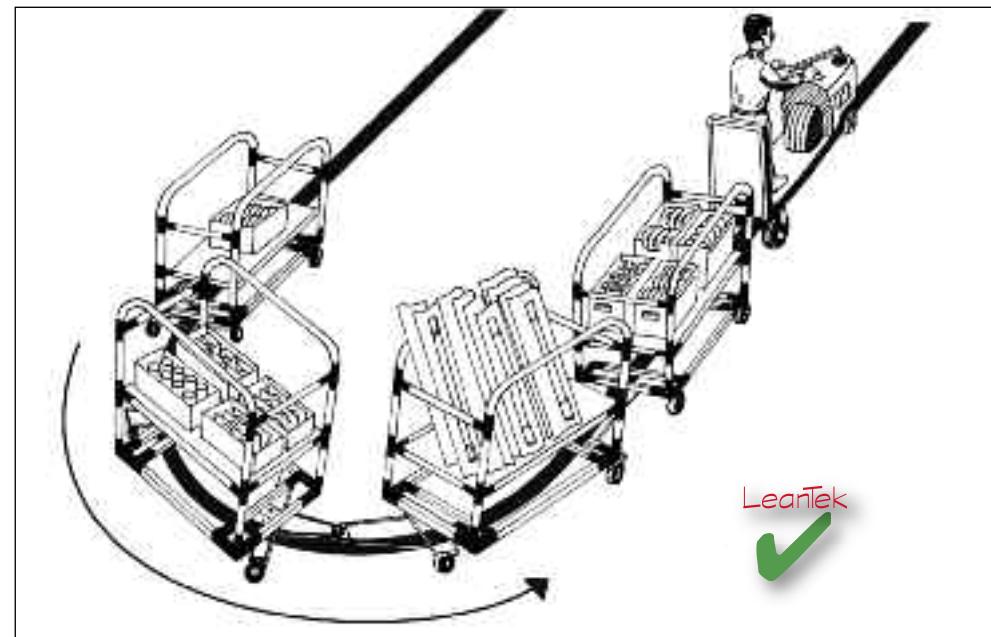
LeanTek's Metal-Base® system can also be used to construct the small production line delivery trains recommended by the Lean Manufacturing method.

The towing options offered by the Metal-Base® system make it ideal for creating flexible delivery trains. Once the Metal-Base® base has been constructed, it only remains to add the front and rear towbars and towable MB-160 castors to create the wagons. Bases and superstructures can be customized, removed and reused, thus reducing the cost of change and maintenance.



## Self tracking bases

Trilogiq modular self tracking metal base trolleys have 2 exclusive advantages: modular design and the self tracking function. Using the components on pages 133 to 135 you have the ability to make towable metal bases yourself which follow the path of the tractor, train or AGC. The self tracking function is designed to follow the exact path of the towing unit whilst not cutting the curves in train applications.



# Self tracking bases

**Step 1:**



Assembly of a LeanTek® self tracking base

# Self tracking bases

**Step 2:**



**Step 3:**



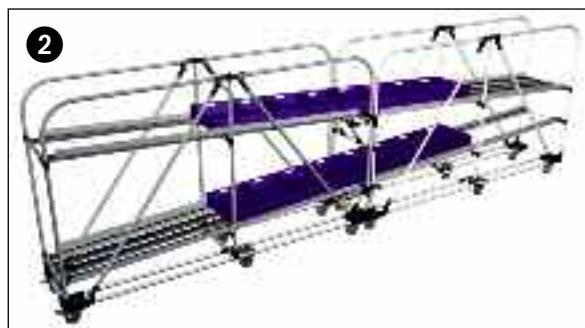
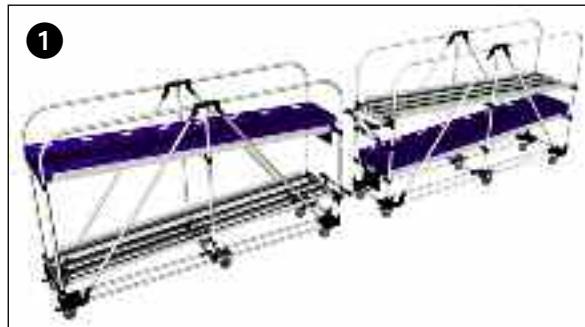
# Self tracking bases

## Step 4:



# The shooters

The Shooter is designed to provide quick transfer loading/unloading of boxes between a cart and a flowrack or supermarket. This transfer is achieved without the operator having to lift the boxes many times. This method is a part of an advanced lean system and reduces the transport muda in logistics. The shooter has a remarkable productivity/cost ratio: it's a typical example of "low cost automation"



In "transport" mode, the infeed-outfeed are locked by a simple gravity mechanism : boxes cannot fall out.

Once joined with the flowrack the infeed-outfeed are unlocked automatically: full boxes move from cart to flowrack, the opposite for empty boxes. The whole operation is done simultaneously in a short period of time.

During separation the infeed-outfeed are locked again to ensure stability of boxes on the shooter.

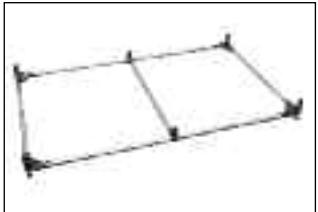
# Tubular bases

Bases (with and without castors) can also be constructed using the tubular system wherever mechanical handling is not required.

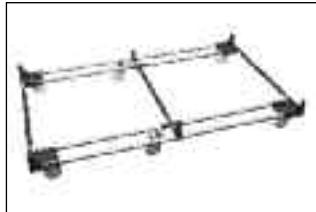
# Guides

## Standard base layouts

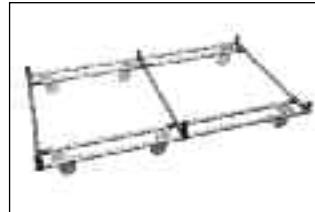
Assembled using the DM-100 plate



Assembled using the Y-B plate



Assembled with F-P components



## Curved tubes

Curved tubes bring better rigidity to your applications, whilst saving on components and assembly time. Trilogiq can deliver pre-cut curved tubes to your specifications with angles up to 180°.



Trilogiq offers a full range of options for guiding containers as they descend gradients.

The main combinations are as follows:

### Using the F-M13 component



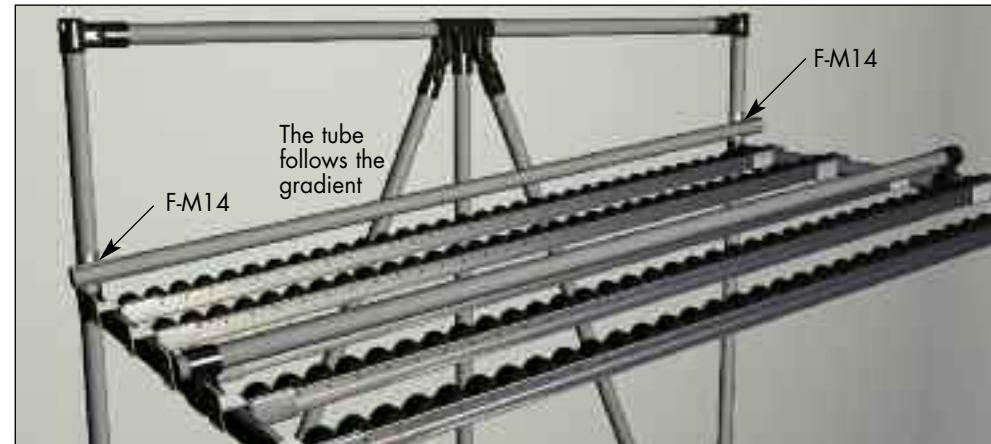
#### Advantages

- Easy and quick to fit.
- Allows diagonal bracing to be used.

#### Disadvantages

- Does not allow levels to follow the gradient.
- Loss of usable width relative to total rack width.

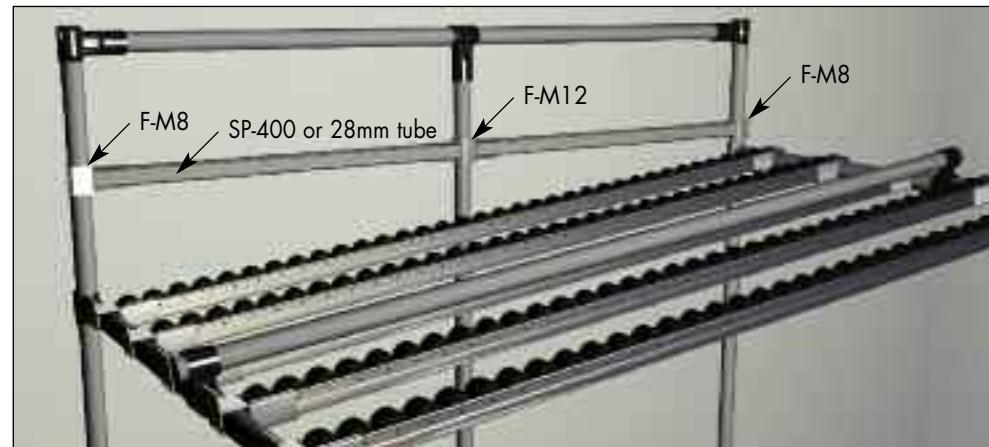
### Using the F-M14 component



Fulfils a similar function to the FM-13, but follows the gradient.

# Guides

## Using the F-M8 and F-M12 components



### Disadvantages

- Prevents the installation of diagonal braces and is more complex (and therefore time-consuming) to fit.

## Using LeanTek® GL and GC guides



LeanTek® offers a full range of lateral and central guides in both plastic and composite materials and in 200 and 400 cm lengths. They slide over the roller track to provide integral guidance.

### Advantages

- Very easy and quick to fit
- Follow the gradient
- Save space.
- Allow the structure to be fitted with diagonal bracing.
- Reversible

# Corner racks (bends)

The purpose of a 90° corner rack is to deliver components parallel to the assembly line, whilst retaining the traditional picking position facing the operator.



This is the ideal solution for workshops with restricted line-side depth.

# Rapid level adjustment for flow racks

Trilogiq has developed the rapid adjustment Flow rack.



Rapid adjustment mechanism



Rapid adjustment fitting

# Automatic return system

## Automatic return system Using the F-V1



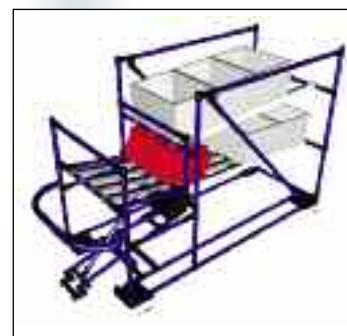
### Stage 1

Red bin in use.



### Stage 2

Pulling the T rack towards you makes the red bin fall to the return level.



### Stage 3

Pushing the T rack back brings the white bin forward.



### Stage 4

The white bin is in position to be used and the red bin has been returned.

# Returning empty containers

There are 3 types of empty returns:  
upper level, lower level and lateral.  
Empty returns systems will be  
constructed using one of these  
principles, according to the  
constraints you have in terms of  
space and ergonomics.

Lower level empty returns system.

## Return level positions



Upper level empty returns system.



Lateral empty returns system.



# Dynamic conveyors

Using LeanTek® roller tracks

## RR-400: industrial roller tracks suitable for most applications



RR 400: The standard roller track.

Fitted with the large-diameter 34 mm rollers suited to the majority of applications, the RR-400 delivers high flow quality. The high density of 28 rollers per linear metre means only 1 mm spacing between rollers. This high density ensures a smooth flow.



# Dynamic conveyors

Using LeanTek® roller tracks

**LW-400: large diameter roller tracks for large cardboard and polypropylene containers.**



LW-400: Large Wheel conveyor.

The large-diameter reinforced roller track is ideal for larger non-rigid containers, such as cardboard cartons and polypropylene bins. It is also recommended for end-of-line stock and stacks of boxes. The large 44 mm diameter of the 20-mm wide rollers makes it easy to move large containers with a smooth flow.



LW-400  
Carton application



LW-400  
End-of-line stocks

# Dynamic conveyors

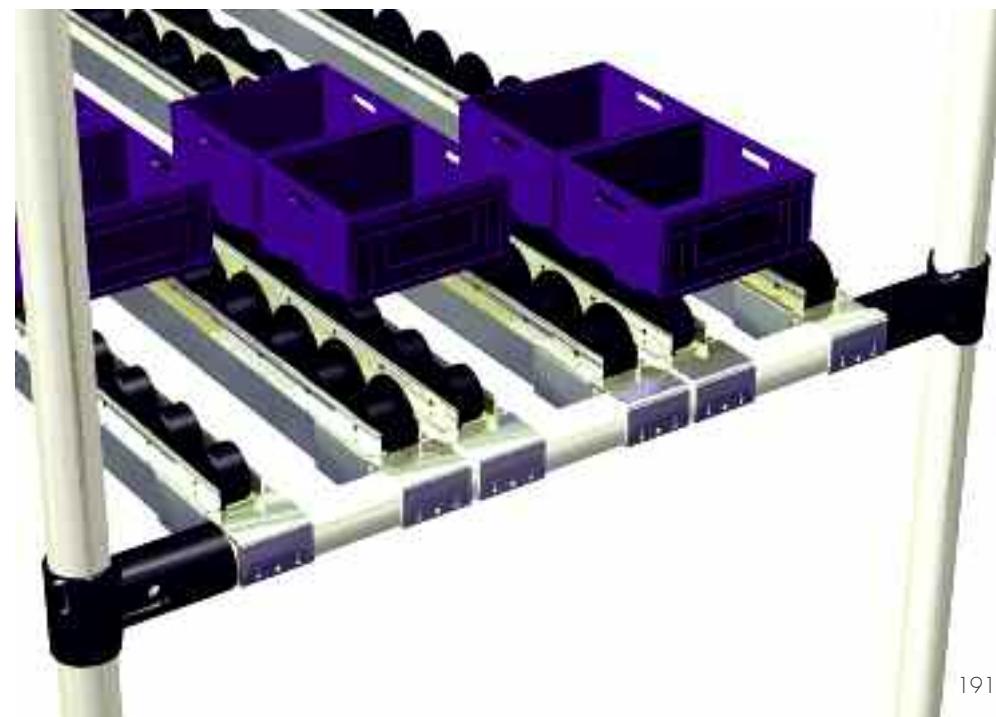
Using LeanTek® roller tracks

**FW-400: the ideal flanged wheel conveyor for small containers**



FW- 400: Flanged wheel conveyor.

The reinforced integrated guide track FW- 400 is advised for use only with small containers (less than 150 mm wide). It enables substantial space saving and self-guidance. It is particularly well-suited to boxes of screws and other small bins.



# Dynamic conveyors

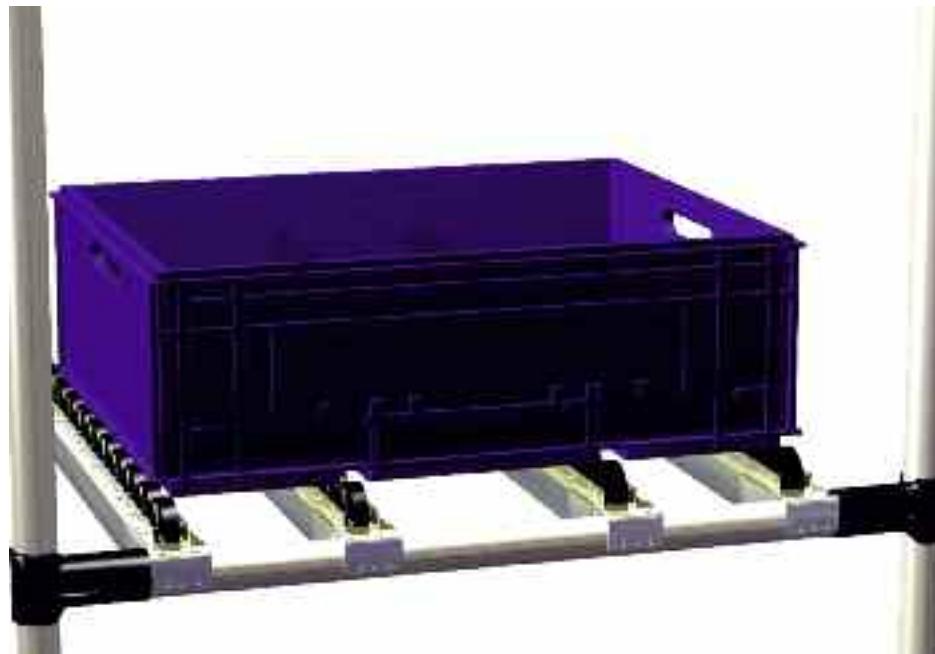
Using LeanTek® roller tracks

**SW-400: narrow roller tracks for integrated guidance – ideal for self-guided KLT applications.**



SW-400: Narrow Skatewheel conveyor.

The SW-400 is used for containers with integral KLT® guide grooves. The SW-400 uses a large diameter roller (44 mm) whose 10 mm width allows it to fit into the bin guide groove.



# Dynamic conveyors

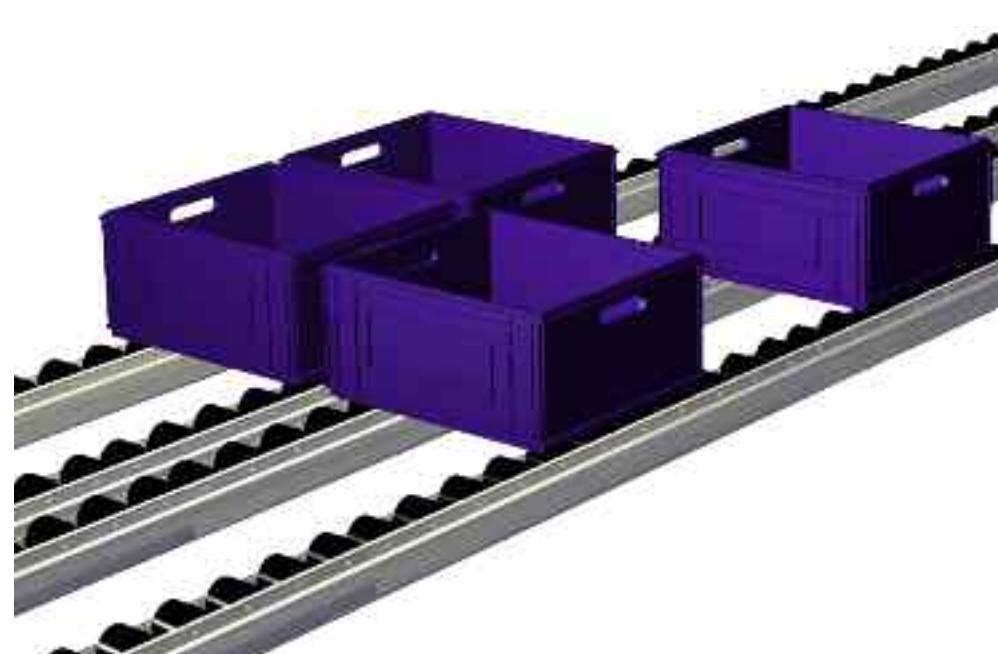
Using LeanTek® roller tracks

**RT-400: Standard roller track with reinforced profile**



RT- 400: Reinforced track.

Reinforced profile version of the RR 400. The RT 400 uses 35 mm diameter rollers, but the carrier profile is reinforced to provide higher bending resistance.



# Dynamic conveyors

## Suspended conveyors



The LeanTek® M-400 monorail is the simplest system to assemble and the strongest in use for suspended conveyor applications.

The M-400 has been designed to be assembled using the standard F-H component as the interface with LeanTek® tubes.



# Dynamic conveyors

## Rollers



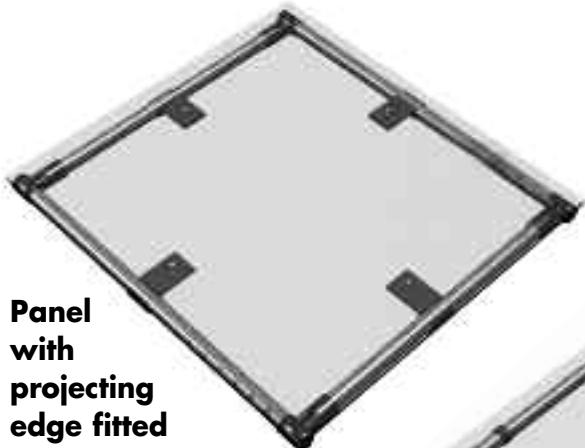
LeanTek® rollers are designed to convey flows of non-flat bottomed bins or components. For example, these rollers are suitable for use with grooved bins and textile conveyor applications.



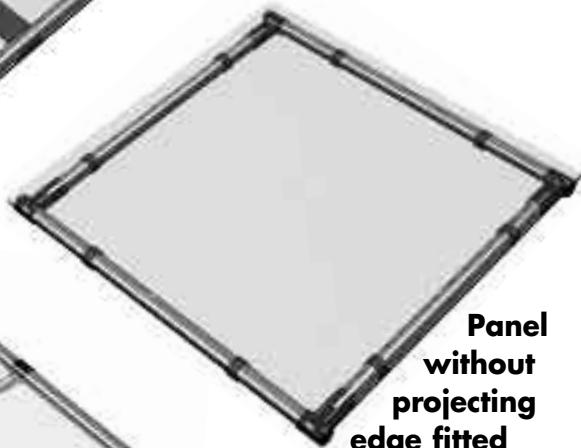
# Panel fitting

LeanTek® offers a range of components to enable panels to be fitted to tubular systems.

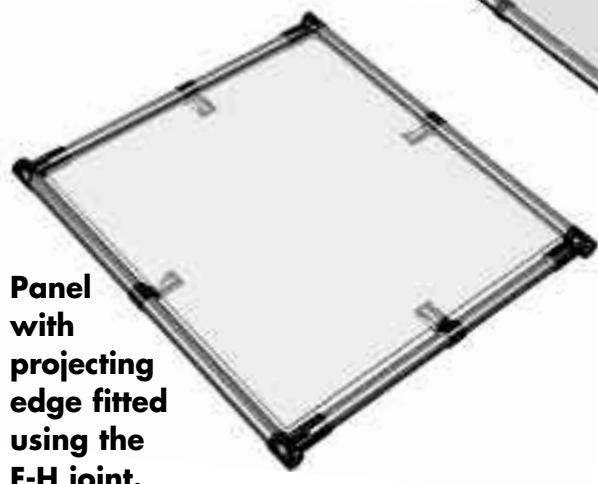
including fastening tubes and the F-3 and F-H components for fitting panels inside a structure



Panel with projecting edge fitted using F-3.



Panel without projecting edge fitted using F-2b.



Panel with projecting edge fitted using the F-H joint.

# Fasteners

## Connector joint screws

LeanTek® offers 2 options for securing joints: the S1 screw and the S4 screw. Both comprise a screw and a reinforced extended nut, whose job is to ensure that the joint does not become unscrewed, whilst remaining easy to use. S4 differs from S1 in that its threads are pre-treated with a threadlock compound ensuring that the tightened fastening cannot become undone once the micro-capsules have polymerized.



S1 and S4 in use.

## F-M multifunction connector fasteners

Joints from the F-M range are connected to tubes using the S2 cone point set screw.



## S3 - S5 castor plate fitting screws

FP plates use the S3 screw.  
PI plates use the S5 screw.



The S3 screw in use.



The S5 screw in use (with YB-L and PI-10).

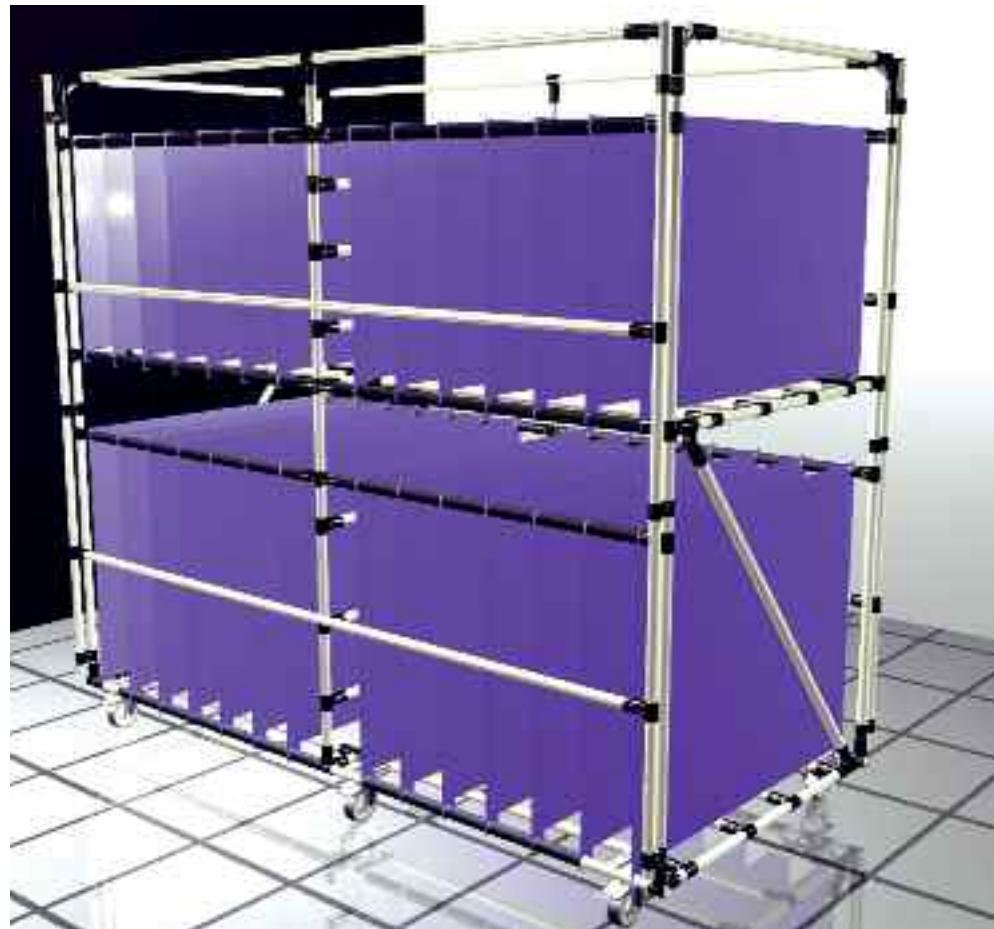
## S6 - Metal Base® fitting screws

Metal-Base® components are connected together using S6 screws.



# Technical specifications

At Trilogiq, technique serves function. Our technical data allows us to predict how your application will react to the loads and constraints you plan to place upon it. Our technical specifications provide data on the deflection and limits of LeanTek® components so that you can choose the best components for your purpose.



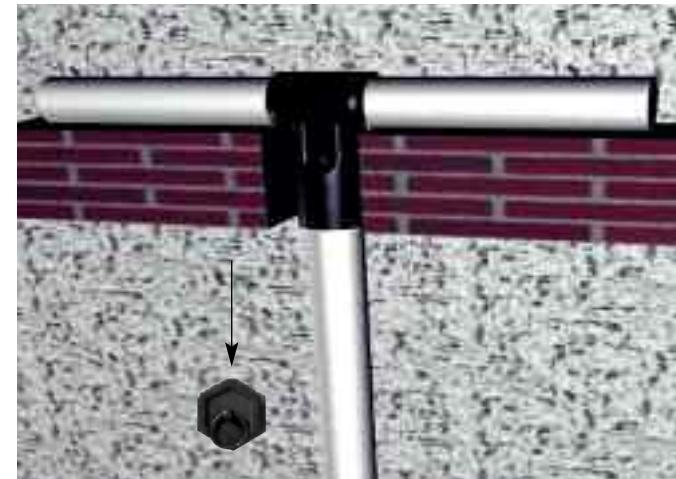
# Load characteristics for connector joints

## Shear strength



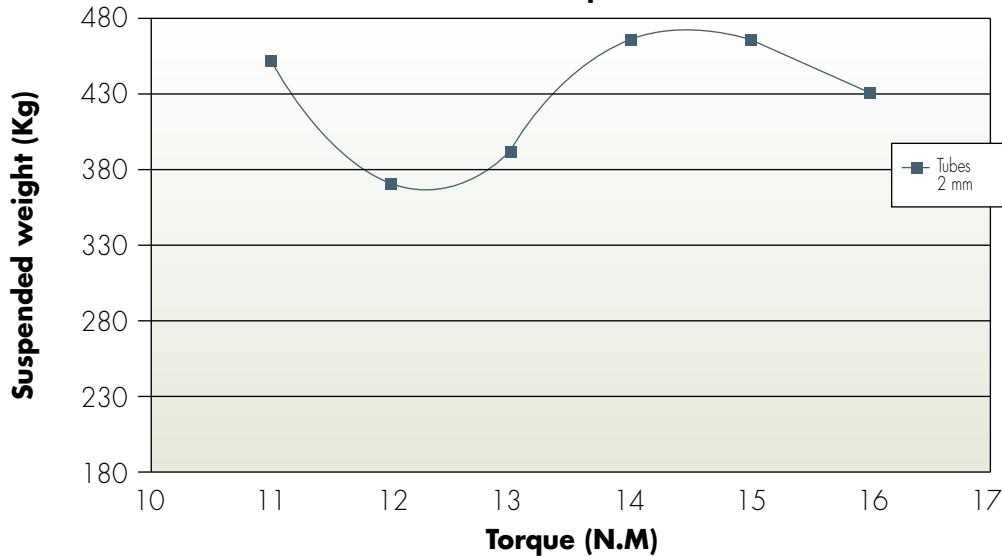
Test method.

## Tension strength

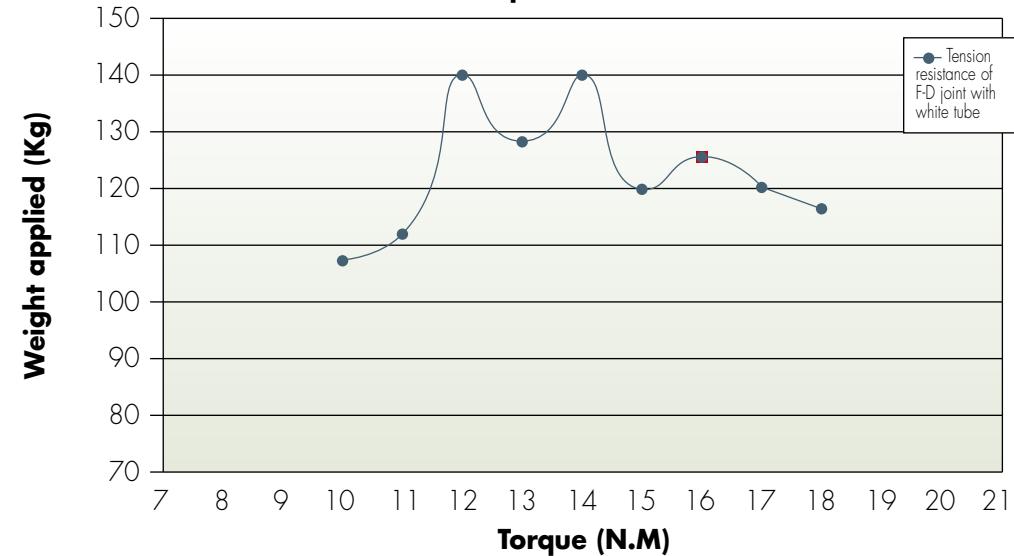


Test method.

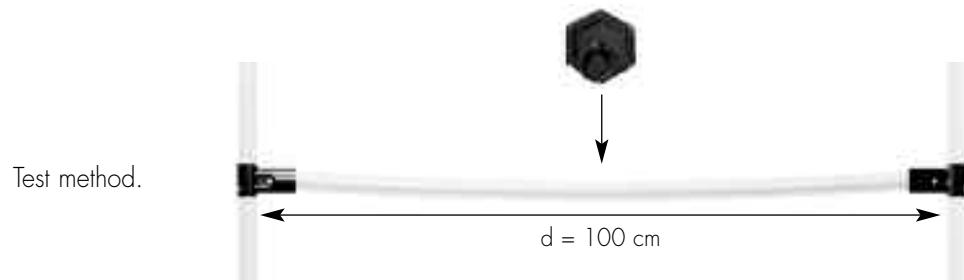
**Shear characteristics for F-D joints fitted to 2 mm tubes**



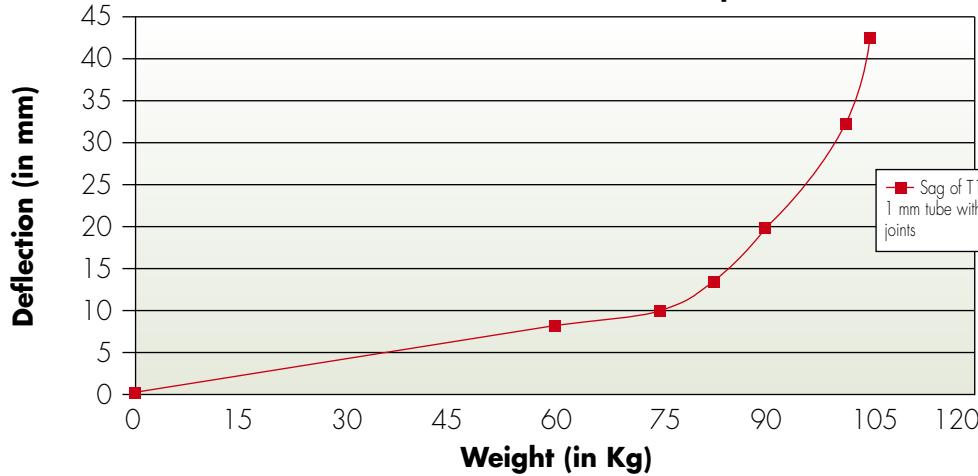
**Tension on F-D joints fitted to 2 mm tubes**



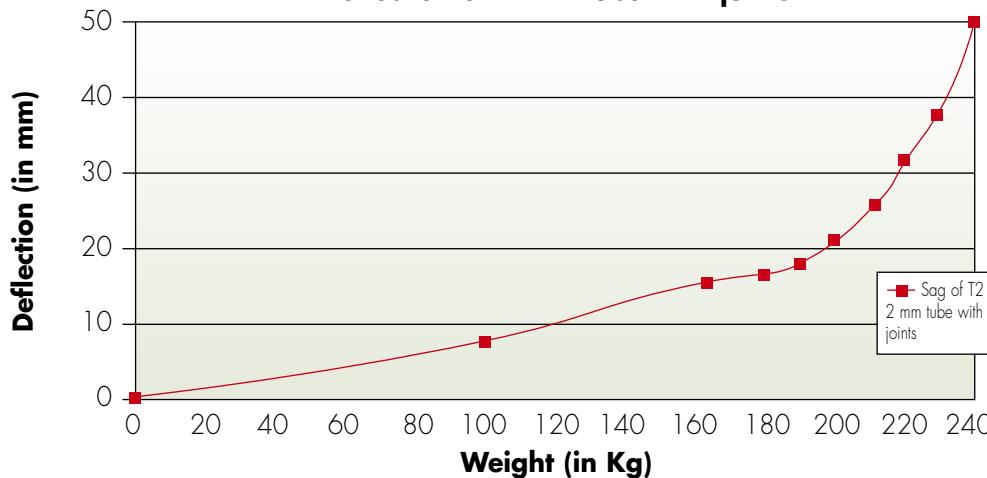
# Tube deflection



Deflection of 1 mm tube with joints



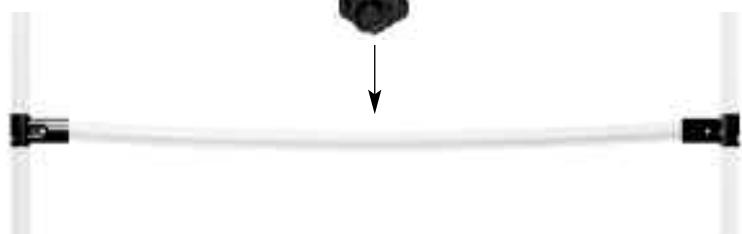
Deflection of 2 mm tube with joints



# Tube strength

**2 mm tubes**

Test method.



Maximum permissible loads for a standard T2 tube with 2 mm walls in deflection only

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Weight limits	Before irreversible deflection	205 Kg	154 Kg	123 Kg	102 Kg	87.8 Kg	76.8 Kg	68.3 Kg	61.5 Kg
	Before failure	244 Kg	183 Kg	146 Kg	122 Kg	105 Kg	91.5 Kg	81.3 Kg	71.2 Kg

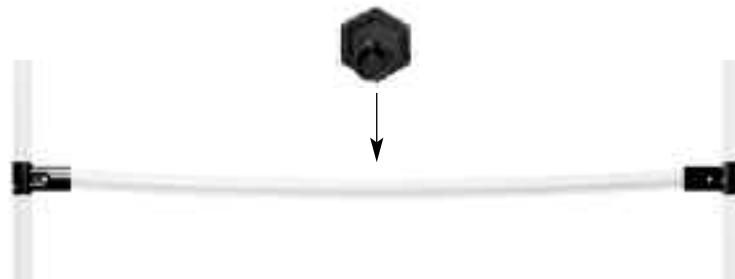
Deflection in mm of a standard T2 tube with 2 mm walls when subjected to a central load

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Suspended weight	10 Kg	0.51	1.2	2.4	4.1	6.5	9.6	14	19
	25 Kg	1.3	3.0	5.9	10.2	16	24	34	47
	50 Kg	2.5	6.0	11.8	20	32	48	69	94
	75 Kg	3.8	9.0	18	30	48	72		
	100 Kg	5.1	12	24	41				
	125 Kg	6.4	15	30					

# Tube strength

## 1,2 mm tubes

Test method.



Maximum permissible loads for a standard T1 tube with 1,25 mm walls in deflection only

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Weight limits	Before irreversible deflection	108.1 Kg	81.1 Kg	64.92 Kg	54.1 Kg	46.32 Kg	40.56 Kg	36 Kg	32.4 Kg
	Before failure	138 Kg	103.2 Kg	82.6 Kg	68.76 Kg	59 Kg	51.6 Kg	45.8 Kg	41.28 Kg

Deflection in mm of a standard T1 tube with 1,25 mm walls when subjected to a central load

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Suspended weight	10 Kg	0.91	2.2	4.2	7.3	11.5	17	25	34
	25 Kg	2.3	5.4	10.5	18	29	43	61	84
	50 Kg	4.5	10.8	21	36				
	75 Kg	6.8							
	100 Kg								
	125 Kg								

# Roller track strength

## RR-400

19 Kg



Test method.

Maximum permissible loads for an RR roller track in deflection only

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Weight limits	Before irreversible deflection	197 Kg	148 Kg	118 Kg	98.7 Kg	84.6 Kg	74 Kg	65.8 Kg	59.2 Kg
	Before failure	237 Kg	178 Kg	142 Kg	118 Kg	102 Kg	88.8 Kg	78.9 Kg	71 Kg

Deflection in mm of an RR roller track when subjected to a central load

		Distance between supports							
		0.75 m	1.0 m	1.25 m	1.50 m	1.75 m	2.0 m	2.25 m	2.50 m
Suspended weight	10 Kg	0.30	0.7	1.3	2.3	3.6	5.4	7.6	10.5
	25 Kg	0.70	1.7	3.3	5.7	9.0	13.4	19	26
	50 Kg	1.4	3.4	6.5	11.3	18	27	38	52
	75 Kg	2.1	5.0	9.8	17	27	40		
	100 Kg	2.8	6.7	13	23				
	125 Kg	3.5	8.4						

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