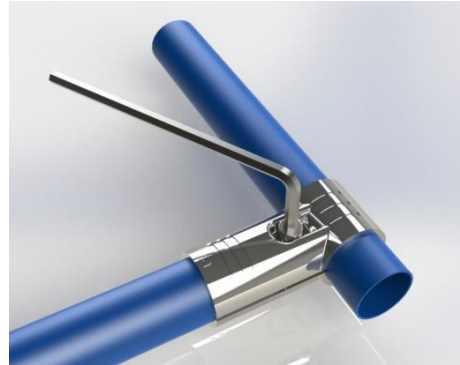


Connect a Tube Technical FAQ's and Assembly Guide

ross
handling

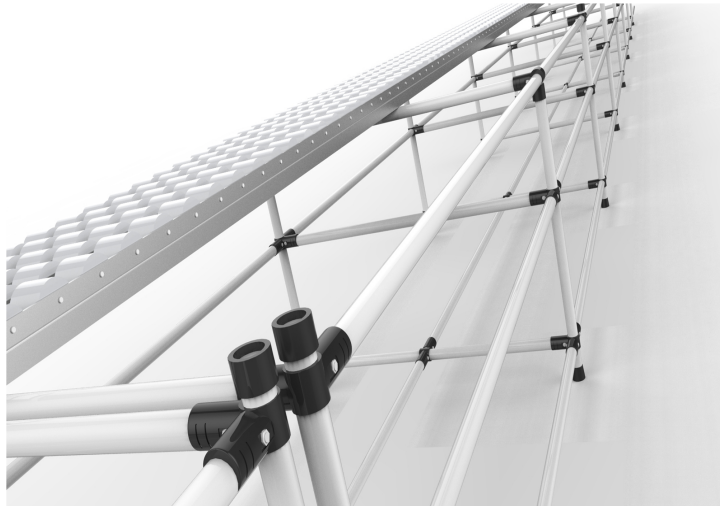


Ross Handling

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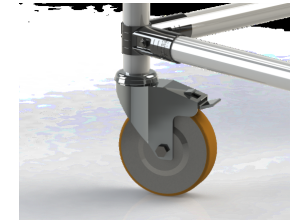
1. What is Connect a Tube?



Connect a Tube

Connect a tube is a product that enables you to make a huge variety of material handling systems. This pipe and joint system consists of a variety of metal joints and pipes that are connected together to construct bespoke storage, racking, conveyor systems, work benches, exhibition stands and trolleys.

Its giant Meccano for Lean Manufacturing and Lean Warehousing. The list of things you can make with Connect a Tube is only limited by your imagination!



Advantages of Connect a Tube

- * Versatile
- * Easy to Assemble
- * Re-Usable
- * Cost Saving



Top Tip! Safe working requirements

If necessary, wear gloves & safety shoes when handling bundles.
Wear safety goggles during cutting of pipes and roller track.
Always deburr cut tubes and roller track.

2. What are the Tube Types?

ABS Tube

2meter lengths Inner Steel with an ABS plastic coating to ensures a perfect finish.
Constructed with a special adhesive between layers.
In Red, White, Black, Blue and Grey.
Anti rust coating on the inside ensures long life.

Outside tube diameter 28mm

Tube Wall thickness 1mm



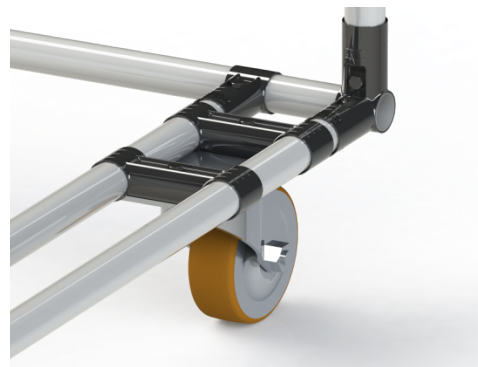
Stainless steel tube

2meter lengths Stainless Steel Tubes - ideal for hygienic and clean room environments, food manufacturing and also for shopfitting displays.

Outside tube diameter 28mm

Tube Wall thickness 1.2mm

The tubes are available in standard lengths of 2 meters, they can also be cut to size for delivery to the customer. We can also offer a bespoke assembly service



3. What are the Metal Joints?



The Metal Joints

With the Connect-A-tube pipe and joint system you can realize almost all of your ideas when manufacturing equipment.

The metal joints connect the tubes securely together: Various shapes can be formed: such as square, straight, hinged and parallel arrangements. You can also combine the Connect-A-tube system with the aluminium profile system.

The metal joints are available in black or nickel coated options and are made from 2.5mm mild steel. There is also a portfolio of plastic parts that interact with the Connect a tube pipe and joint system. Assembly of the system is achieved by using only a hex head M6 bolt in combination with a nut to prevent rotation, thus clamping the tubes and joints together.



+ Grip

A two ribbed patterns on the inside of the joint ensures an optimum grip.

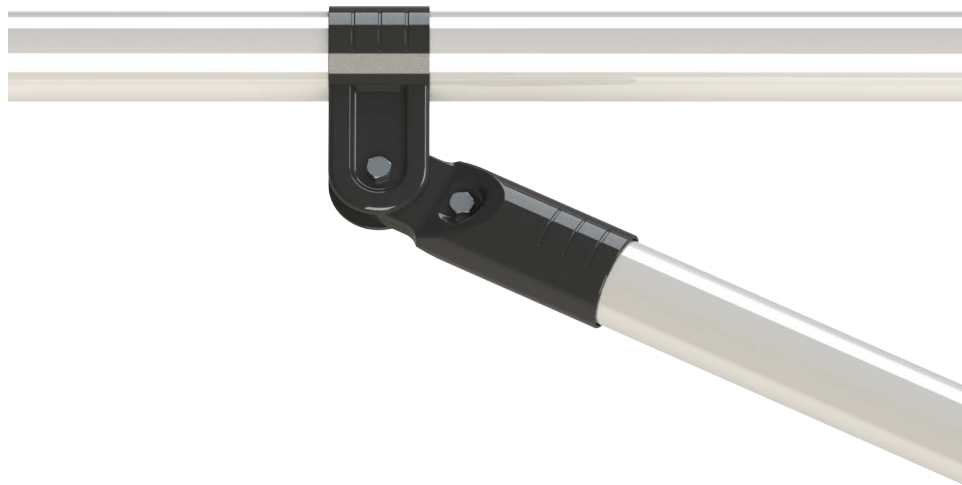
Note: Always check that the tube is inserted fully into the joint (30mm) using the witness marks present on the joint in the area of the grip patterns.

+ Joint strength

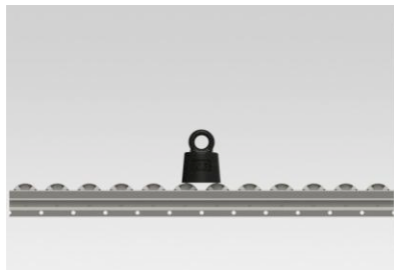
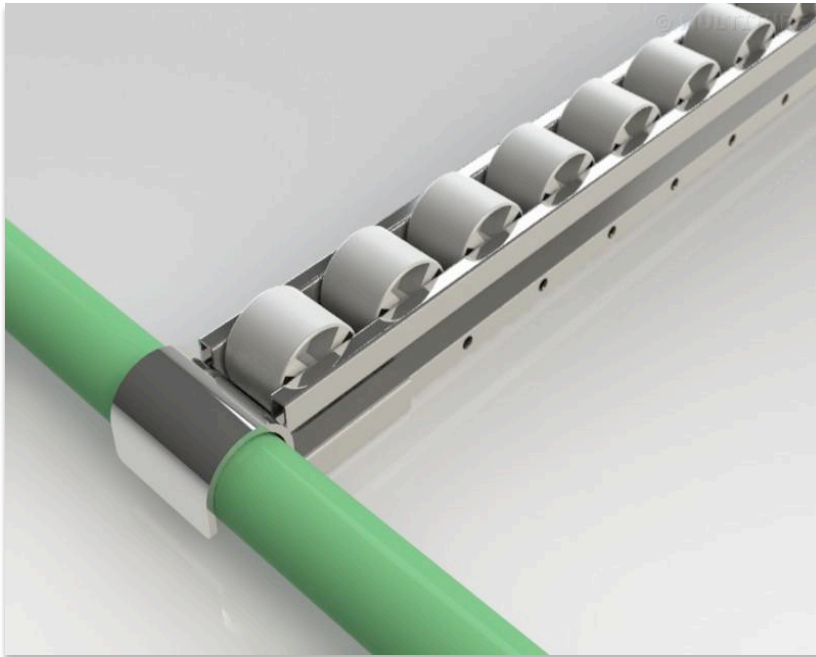
Each joint has a maximum load capacity of 80Kg in shear before slippage of the joint occurs. This is based on an approximate bolt torque of 10Nm for a joint assembly

+ Design

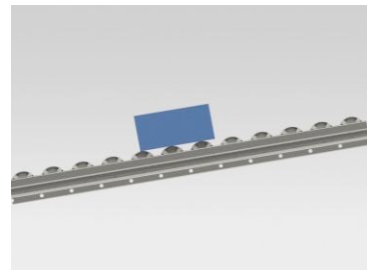
Connect-A-tube uses only high quality steel for its joints. The holes in the joints for the bolts are punched post forming to retain the shape of the hole. The steel used for the joints is 2.5 mm thick



4. Accessories - Roller track



Maximum load per meter.
40mm wheel Dia 30 : 100 kg



Minimum recommended angle.
40mm: 5 degrees
Depending on the product surface.



Assembly

The roller track can easily be assembled by fixing it to the tube via the roller track end fittings.



Length

Roller track comes in standard lengths of 2 meters. Pre cut lengths can also be supplied on request. Longer lengths are available on request.



Braking system

A Braking system can be applied at the end of the roller track to reduce the momentum of the box or package at the end of the run via a brake that fits over the roller track

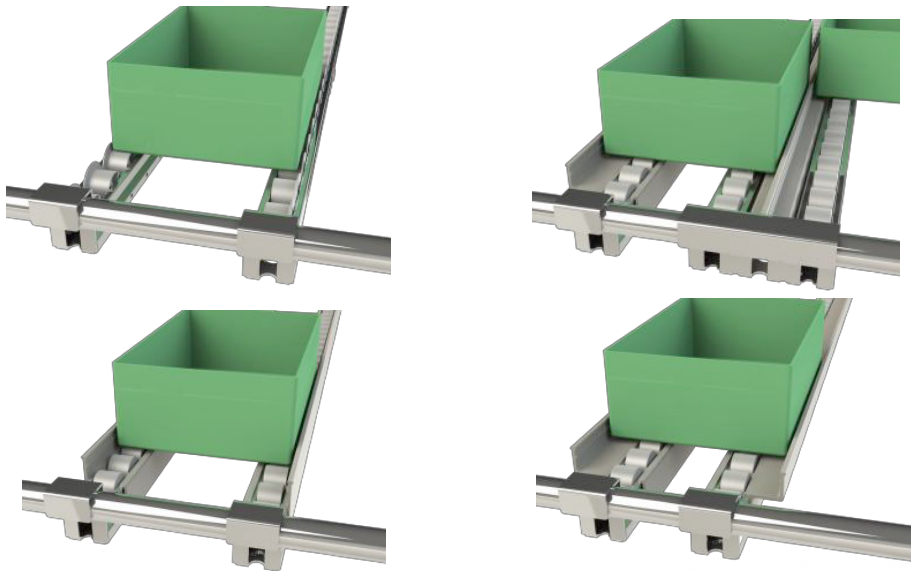


Maximum length

If the roller track length is longer than 1500mm it is recommended that a support is place to prevent distortion.



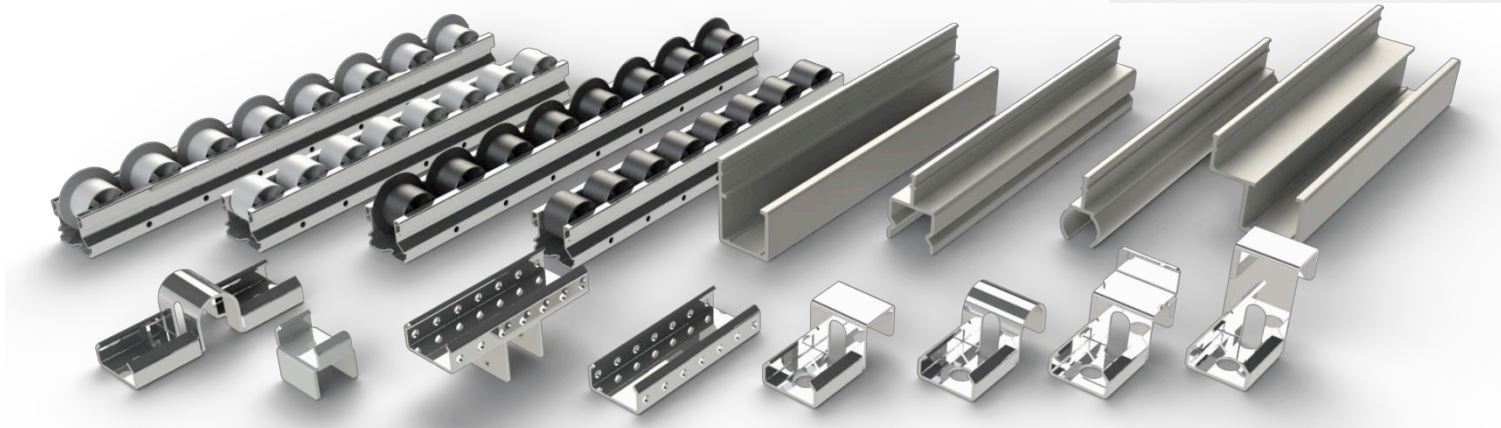
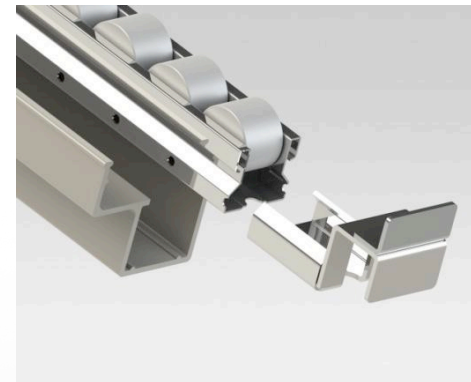
5. Roller Track Mounting



Various mounting options and plastic profiles - contact us for help and advice!

+ Mounting

First determine the length of the roller track and plastic guide profile. Then slide the roller track into the plastic guide. After which attach the brackets to the ends.



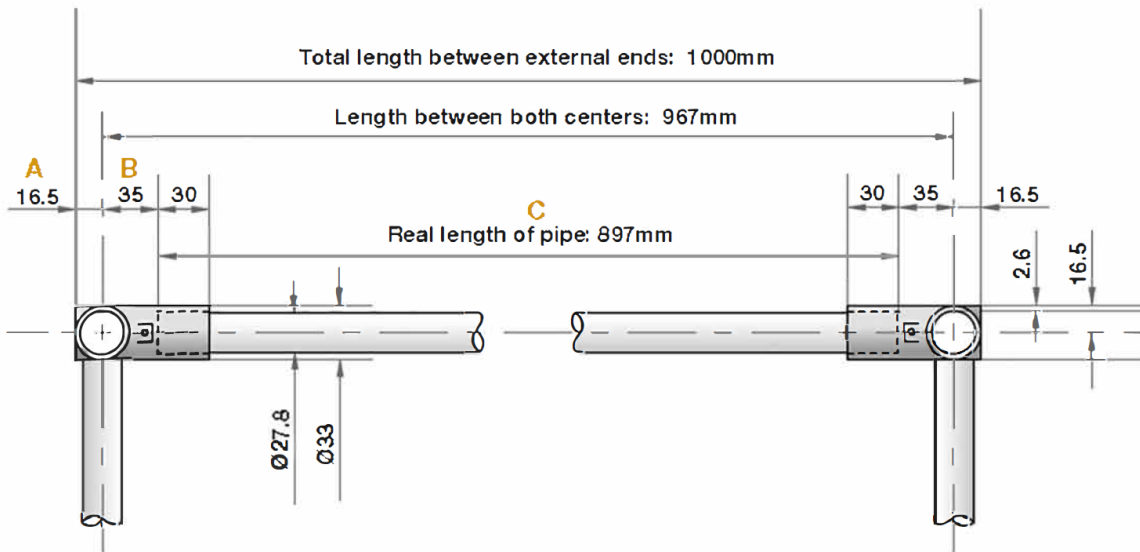
Overview of basic roller track components from Connect-A-tube

6. Calculate the tube length?

As long as you know the basics, such as internal dimensions of the joints, (A+B shown below), we can make measuring easy. Simply measure your space, take away the number of joint spaces, and you are left with the pipe length.

In the example below, a 1m long unit is calculated as

Desired overall length (1000mm) - (A 16.5mm + B35mm)x 2 = C Pipe Length 897mm



The Grip

A two rib patterns on the inside of the joints ensure optimum grip.



Dimensions

Tubes have a nominal diameter of 28mm. Joint have an inside diameter of 28mm and an outside diameter of 33mm.



Calculations

Have a look at our quick calculation above to help you with your measuring!

7. Top Tips - Proper use of joints



Corner connections

Whenever possible use angles for inner and outer corner (E-2 + E-3) connector to prevent distortion.

Use of connector type E1 in the construction shown can lead to deformation.

As a rule of thumb: At least three fixed angles at the base of the structure



E-2BK



E-3BK



Torque requirements

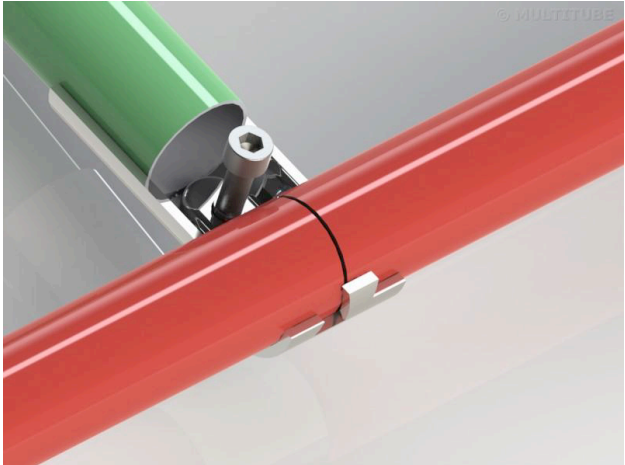
Tighten nuts and bolts to between 10Nm and 12 Nm. This may be done via hand with a 5mm Allen key

Use the long side of the key as a lever and tighten the bolt firmly.

Ensure that all construction bolts are properly tightened. When in doubt, use a torque wrench!



Top Tips - Proper use of Joints continued...



Grip points

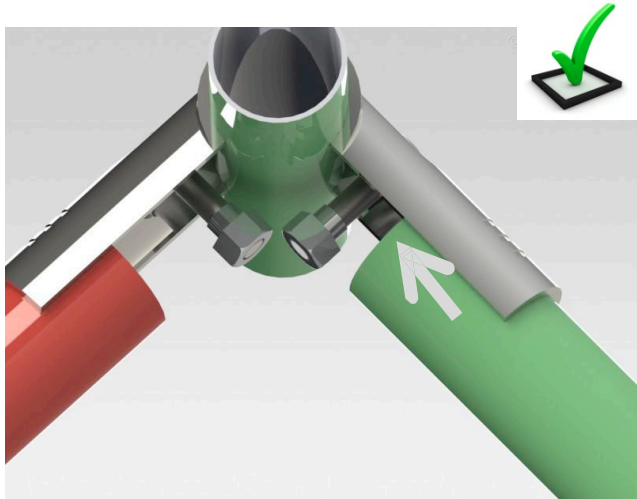
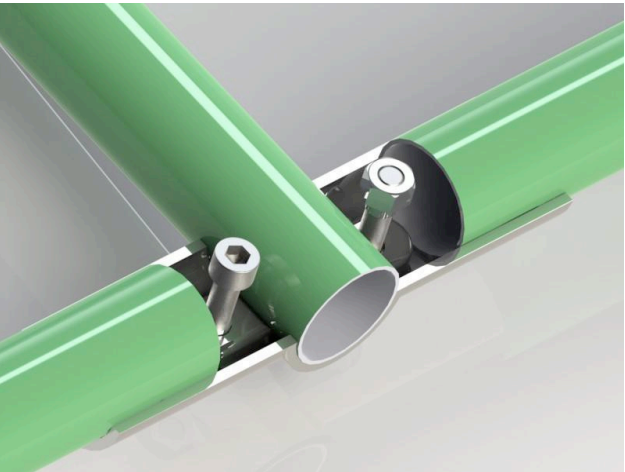


Each set of grip points in a joint is only suitable for use with one tube. The joint should not be used to extend pipes!
For example use the correct joint designed for the application you are working on.

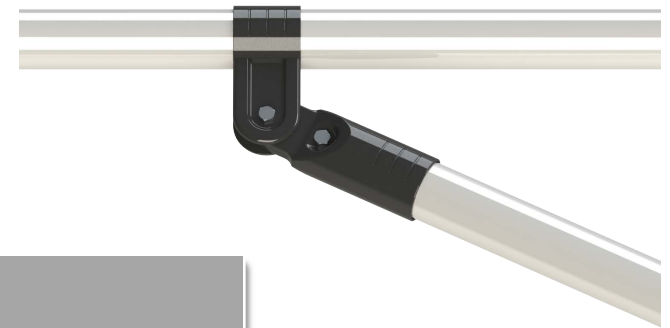
Gripping



Attach tubing joints correctly.
Insert the tube past the two gripping points in the joint. Check this is correct before applying torque to the nuts and bolts. Then check again that the final construction has been fully tightened to the required 10Nm.



8. What is the Maximum unsupported free span ?



Support required when the spans is over **1500 mm** to prevent deformation of the structure



Span

Horizontal tubes and roller track longer than **1500mm** should be supported by vertical or diagonal tubes. Given the wide variety of solutions existing this information is given as a guideline only.



Support

Use of a vertical tubes, diagonal tubes or a double tube arrangement can be used to prevent deflection. Combinations of these options are also possible and commonly used.



Use of a double tube structure to prevent deflection. Apply this principal to at least three areas in the construction.



Divide the structure into smaller areas.



Use brace tube for support along with the 45 degree connectors or flexible angle connectors.

9. Castors & Wheel selection and assembly



Plated Wheels

Plate wheels are used in the following situations:

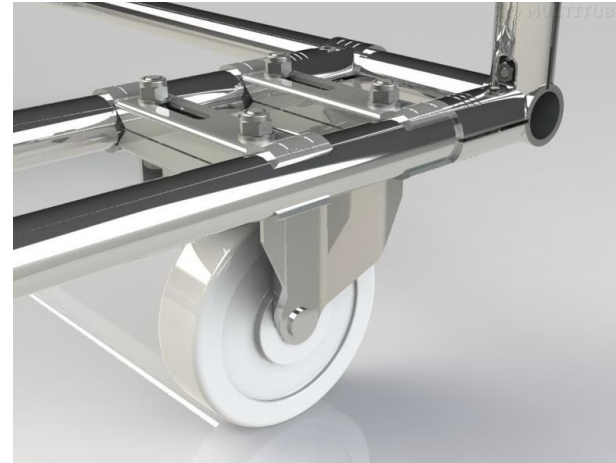
- Where the load exceeding 200 kilograms
- Uneven floor surface.
- Where wheels must be contained within the frame of the structure.



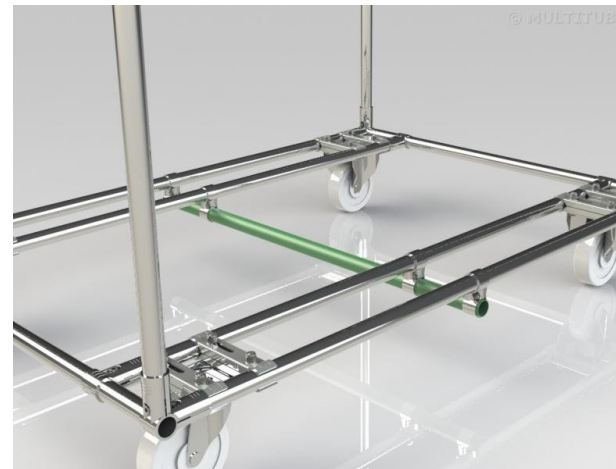
Place wheels at least 500mm apart from each other in order to prevent tipping and stability issues.



2 X Castor Brackets
CM-100



Required fixings: M8 nuts & bolts with a washer along with special castors bracket fittings for wheel attachment.



A tube can be attached to prevent distortion of the base if required.

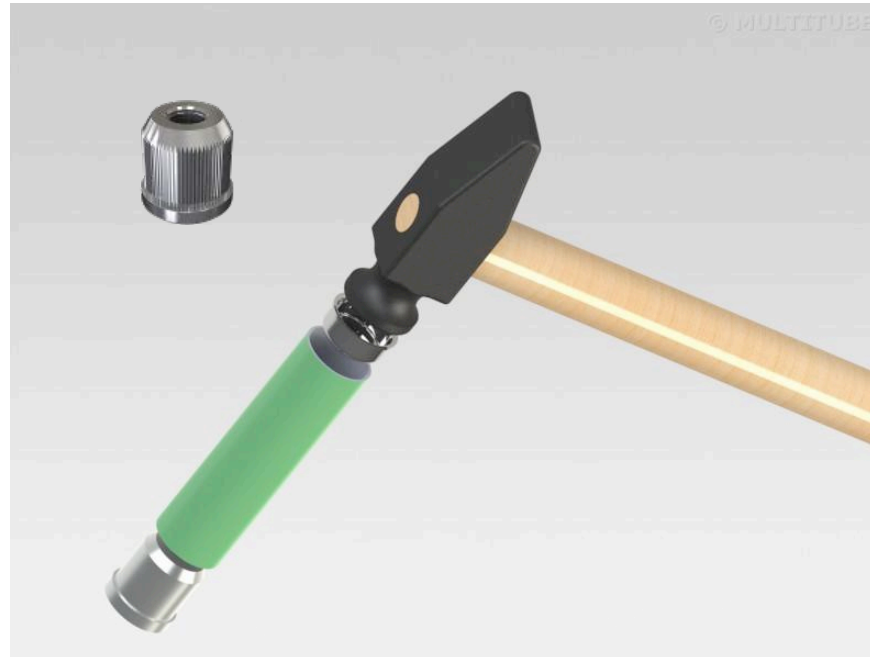


10. Bolt hole Castor selection and assembly

Bolt Hole Castors Inserted

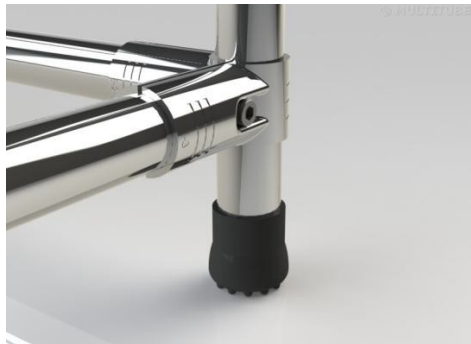
With the use of an insert (BS-2810-B)you simply attach bolt hole castors by inserting a threaded steel bush into the tube. This insert has a M12 thread that will be used for attachment of the M12 bolt hole castor wheel.

Used in heavy applications it is advisable to use Loctite or another high performance industrial adhesives.



11. Adjustable Feet and assembly

Rubber feet



Joints for attachment



Steel feet & inserts



We offer a range of accessories to suit our pipe and joint system including feet and bolt down corner brackets

12. How do I use diagonals?



The use of fixed or flexible angles joints to form diagonals.



The use of standard connectors to form diagonal.



Diagonals

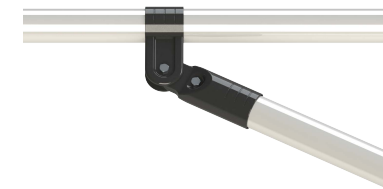
Use diagonals to ensure structural stability. Diagonals are to be placed between a horizontal and a vertical tube.

Diagonals should always be used in a mobile structure and also in equipment using roller track.



Types of diagonals

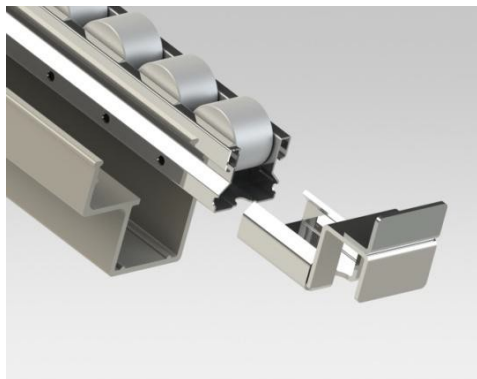
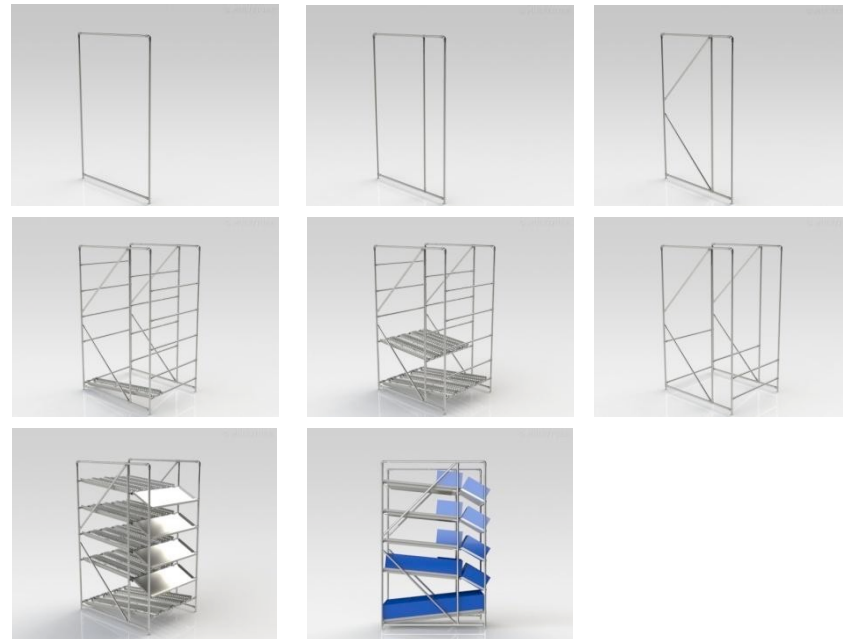
The range of joint available offers multiple options when adding diagonals. Both the angle connectors, flexible angle connectors and standard connectors can be used depending on the design and orientation of the tube. With the flexible angle joint you can virtually form any angle you require.



13. The building of a flow rack (version 1)



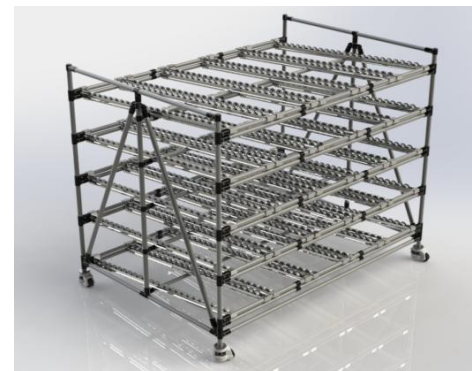
Modular units used for line side picking.



First determine the length of the rollertrack and plastic guide. Then slide the rollertrack into the plastic guide. After which attach the brackets to the ends.



Various combinations of track angle are possible this being dependent on the application. The return of the boxes in this case are at the top of the rack.

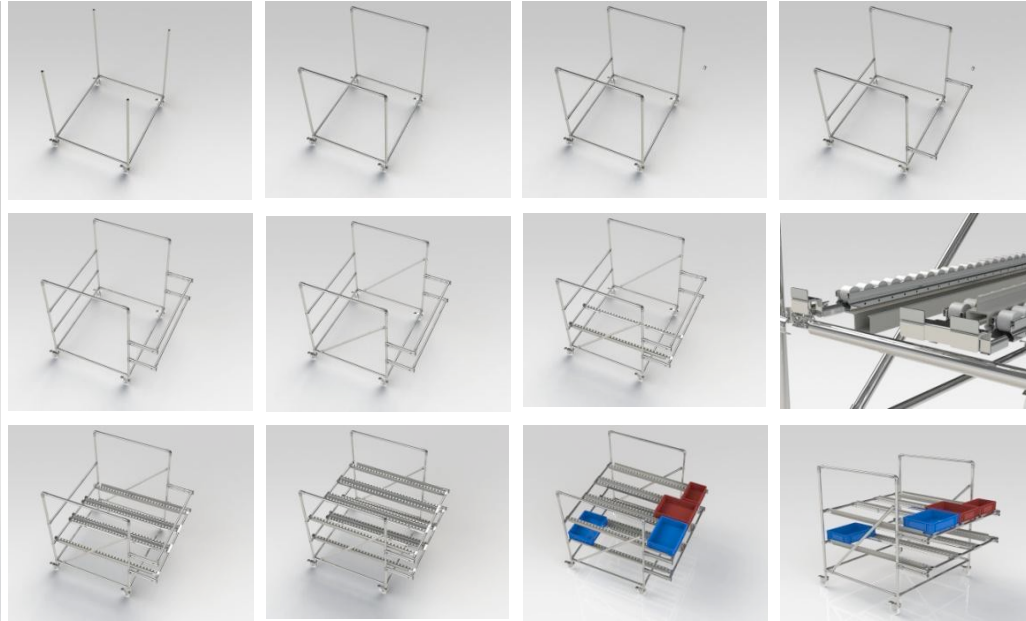


Various combinations are possible: This the unit is mobile to allow for cleaning and relocation.

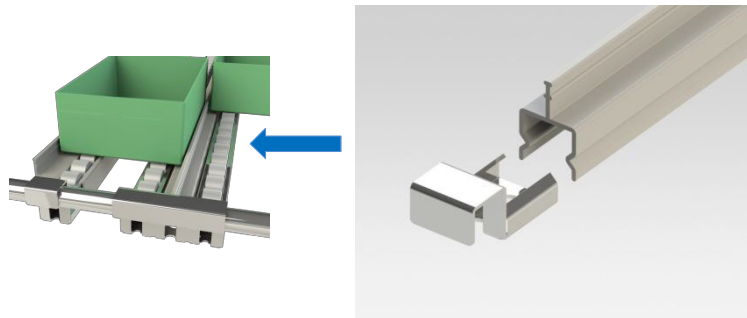
14. The building of a flow rack (version 2)



A flow rack application in combination with a workstation



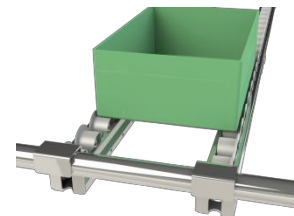
An overview of plastic guide options shown below



Offset profile in combination with flat roller tracks, and a centre guide profile.



Offset profile in combination with flat roller track.

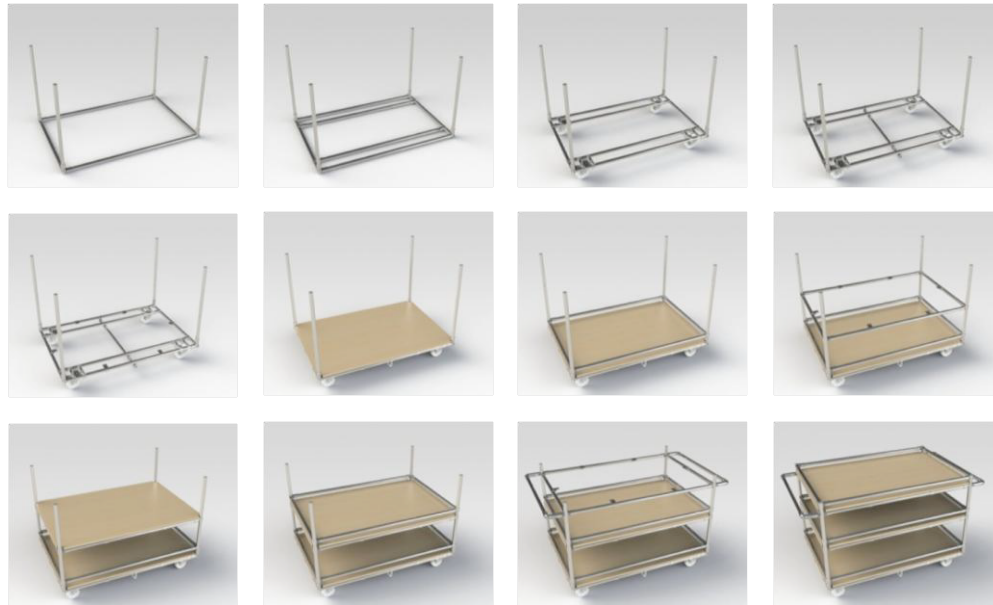


Flanged rollers act as railroad tracks for guiding containers and boxes.



Flat roller in combination with fitted profile.

15. The building of a transport trolley



Exploded view of a transport trolley

Tighten nut and bolt to 12 Nm (Firm with the hand)



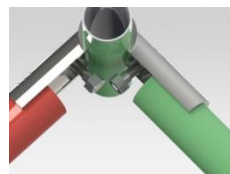
Exploded view
Plate wheel mounting



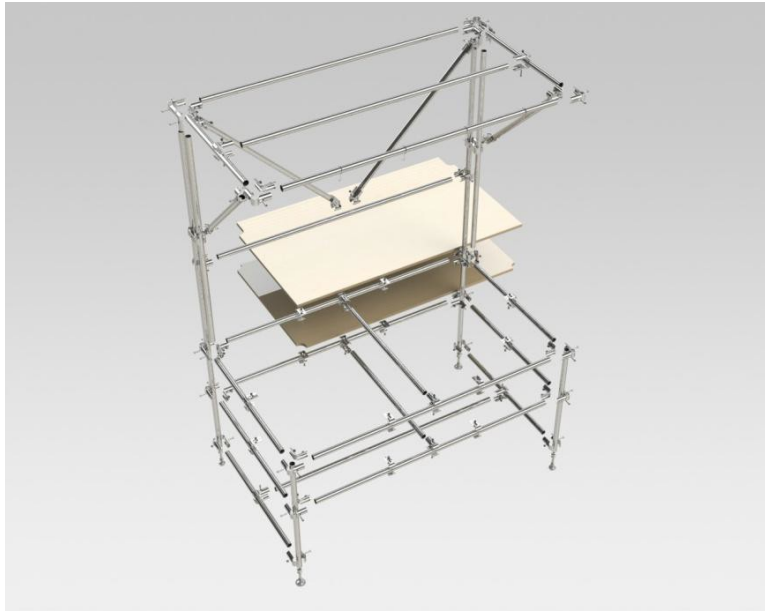
Exploded view
Assembly of joints E2 & E3



Make proper use of the system



16. The building of a work station



Exploded view of a workstation



Workstation with mobile flow rack to feed the workstation.



Each workstation is a customized solution. A variety of items can be added.

- Displays boards.
- Lighting
- Tool holders
- Fixed containers.
- Etc.

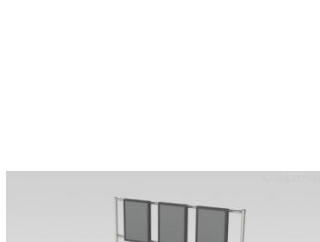
17. Different applications based on weight

Connect a tube is so versatile it can be used from light duty applications up to heavy duty applications



Very Light

< 70 kilo



Light

< 140 kilo



Medium

< 250 kilo



Heavy

- 250 kg load.
- Design by a Key Player.
- Checked & approved by another Keyplayer.

18. Safe working checklist



Safety

Each piece of equipment must meet national safety regulations with respect to stability and robustness.

- ✓ Equipment and other structures must consist of durable materials.
- ✓ Are of sound design and construction.
- ✓ Are in a state such that there is no danger of collapse.
- ✓ No danger of the structure falling over.

The workplace must be arranged as follows.

- ✓ The objects or substances present in that area cause no danger to the safety of staff.
- ✓ No objects present a health hazard through collapse, shifting, rolling or tipping.



Safety Training

Safety is of key importance at all times. A system that can provide 1001 different solutions can also make it possible to construct equipment that can be unsafe. Ross Handling Ltd has attempted in this document to cover all aspects of constructing safe equipment. The advice given in this document is general advice and the end user must ensure the safety of their equipment. (refer to PUWER, provision and use of work equipment regulations)

Ross Handling Ltd makes a clear difference between staff with basic training and staff with advanced design training. Most staff will add to their proficiency by continually using Connect A tube.

Advice should be sought when constructing equipment to carry loads heavier than 200kgs.

No staff should deviate from the guidelines given in the assembly manual.
If in doubt contact us on 0116 2764987 for advice

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18.Safe working checklist continued...

Dynamic operation

In a dynamic setup (including wheels or roller track), the expected maximum load of the work piece must be multiplied by a factor 1.5

For example:
 Concept : mobile setup with roller track.
 Load: 100 Kg.

For a dynamic structures this will be : $load = 100Kg \times 1.5 = 150 Kg$
 This would fall into the category belongs to: Medium range <250 kg load. Therefore seek proper design advice [Call us on 0116 27364987](tel:011627364987)

Specification

Category

Check in which category the structure falls into.

Read assembly instructions.

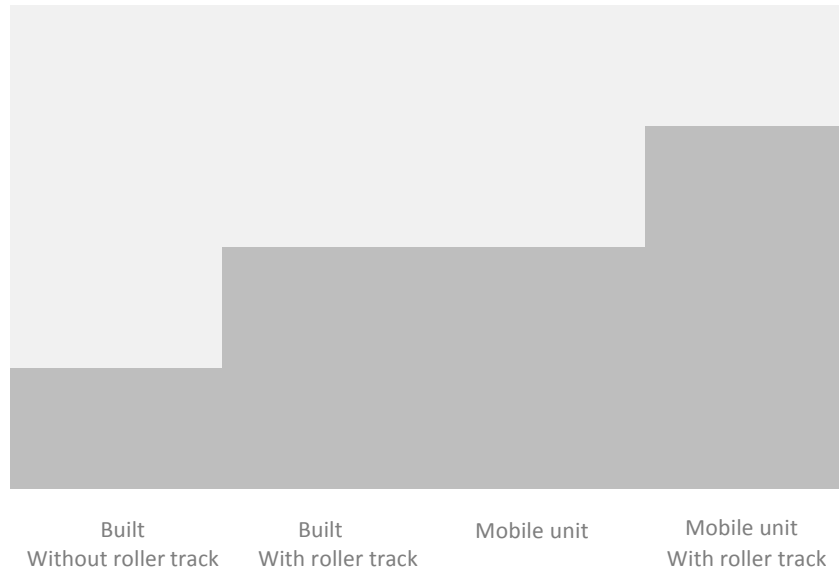
Structures in gray areas need advice from Ross Handling Ltd

Very light
< 70 Kg


Light
< 140 Kg


Medium
< 250 Kg


Heavy
> 250 Kg



18. Safe working checklist continued....

	Concerns	Control and monitoring of newly build structure:	<input type="radio"/> Nr. _____
		Control and monitoring of modifications:	<input type="radio"/> Nr. _____

	Control	Inhouse control and buyoff:	_____
		Contractor control and buyoff:	_____
		Date of control and buyoff:	_____
		Date of next inspection (month/half yearly /yearly	_____
		Part number of equipment:	_____
		Location (number):	_____
		Year:	_____
Serial number (Number of times modified.)	_____		

	Function	Function of the equipment:	_____

18. Safe working checklist

+ **Design details**

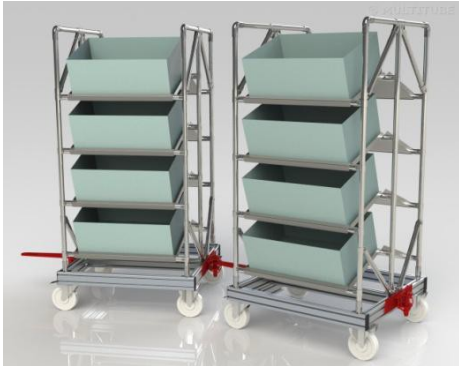
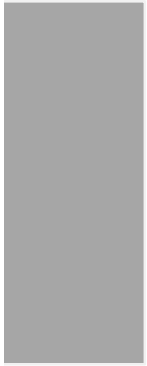
Weight Estimate _____ Kg
 With wheels Yes / No
 With roller track Yes / No

Key-player approval necessary? Yes* / No *(Ask for approval)

Length. _____ cm
 Width. _____ cm
 Height. _____ cm

Height to width (smallest side) ratio:
 Ratio less than 3 : 1? Yes /No* *(revise the design)

Sketch	Cutting sizes



Ross Handling Limited 1 Tuxford Road, Leicester, LE4 9TZ

Contact information

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Web www.rosscastors.co.uk/connect-a-tube