



**English**

*Modular structures to maximise your improvement process*

**[www.enzasystems.com](http://www.enzasystems.com)**

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# **Welcome to our world**

## **Who is Enza**

Enza, meaning “to build” in isiXhosa, is a pioneer in the development of modular structure systems and continuous improvement processes. The best LEAN-Fit for your company.

We design, manufacture and install simple, cost-effective modular structures that are:

- Designed to your specifications to maximise your work environment
- Flexible and re-usable
- Fast and easy to install
- ISO 9001 compliant and environmentally friendly
- Available globally

## **Where is Enza**

Enza Systems provides modular structure solutions to clients across the globe.

## **Our customers**

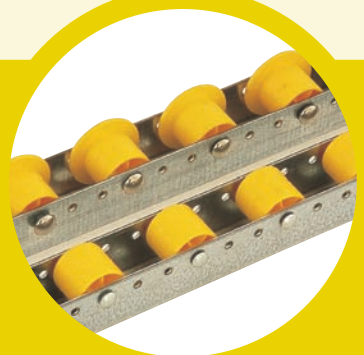
Enza systems are used across industries including the Automotive and Building industries, Agriculture, Retail and Appliance sectors, and by Original Equipment and Computer manufacturers.

Top global brands like Volkswagen, General Motors, Daimler Chrysler, Toyota, Nissan, Ford, Continental Tyre, Behr, Lear Corporation and Johnson Controls are all satisfied Enza Systems clients.

## **Our purpose and objective**

To design, manufacture and install top-quality modular structures that increase flexibility, solve ergonomics problems within the workplace and provide solutions for material management and production line challenges.

**See our website for distributor details**



## **Definition:**

**Lean manufacturing systems use a systematic approach to identify and eliminate waste through continuous improvement by allowing the flow of the product only when the customer needs it.**

## **Lean thinking:**

is the concept developed by Taiichi Ohno (1912–1990) the Toyota executive responsible for production.

## **3 Pillars of Lean production systems**

### **Just-in-Time (JIT):**

JIT simply means that you get what you need, where and when you need it.

### **TAKT Time:**

Takt Time means using standardised work procedures to produce a product at a pace that matches the rate of customer demand.

### **Error free production:**

Error free production means first time quality. By stopping production when a defect is detected, defects are prevented from traveling on to the next process, and can be located and solved quickly and efficiently.

## **LEAN MANUFACTURING CONCEPTS**

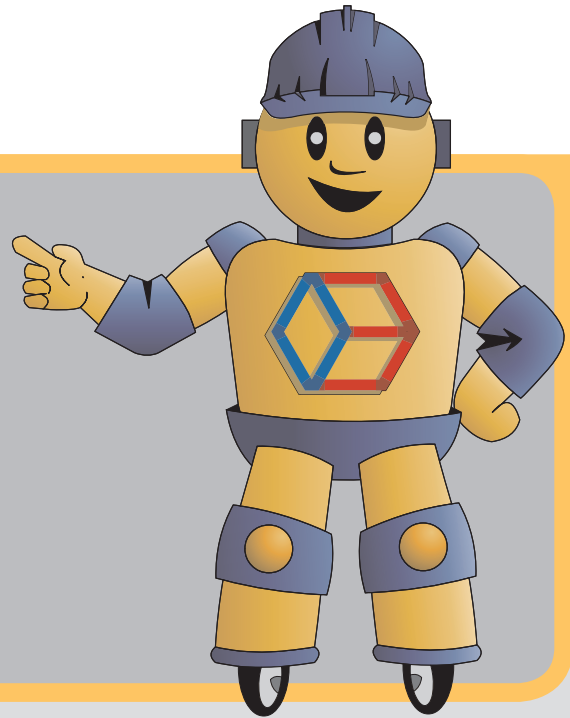
- **5S**
- **One Piece Flow (Cell Manufacturing)**
- **Poka Yoke**
- **Single Minute Exchange of Dies (SMED)**
- **Visual Controls**
- **Waste Elimination**
- **Zero Defects**





## KEY PRINCIPLES OF LEAN

- Directly observe work as activities, connections and flows
- Systematic waste elimination
- Establish high agreement of both what and how
- Systematic problem solving
- Create a learning organisation

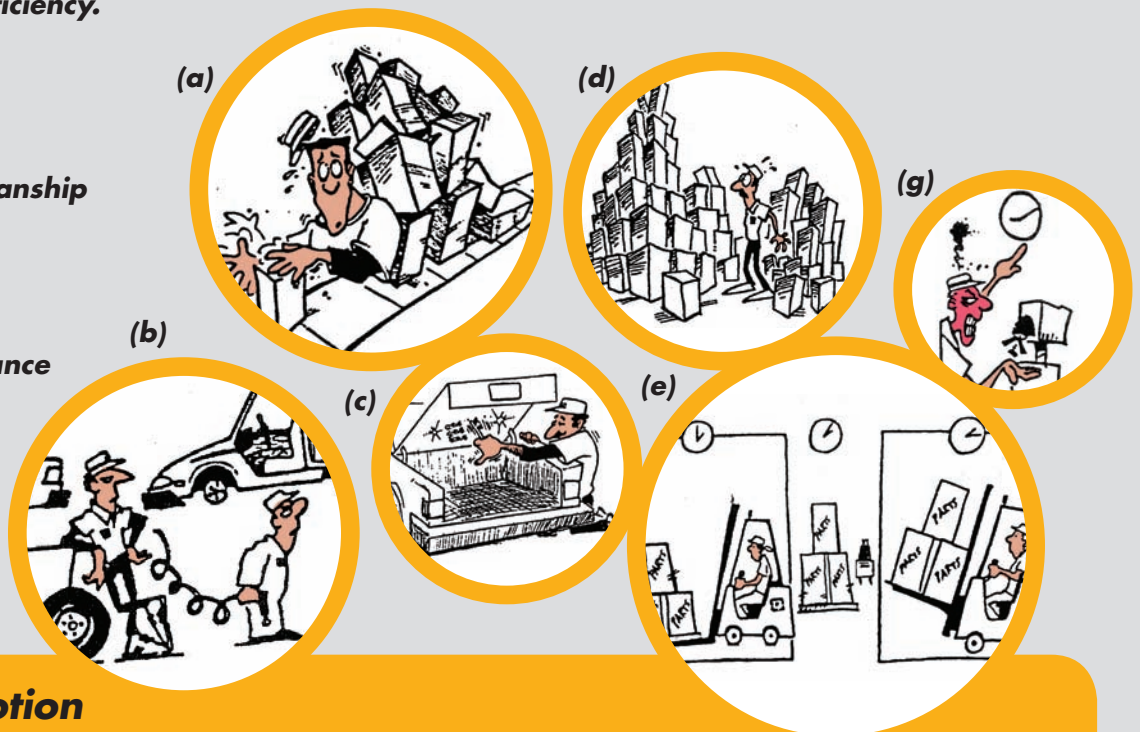


## Main objectives to eliminate waste (7 deadly wastes/Mudas)

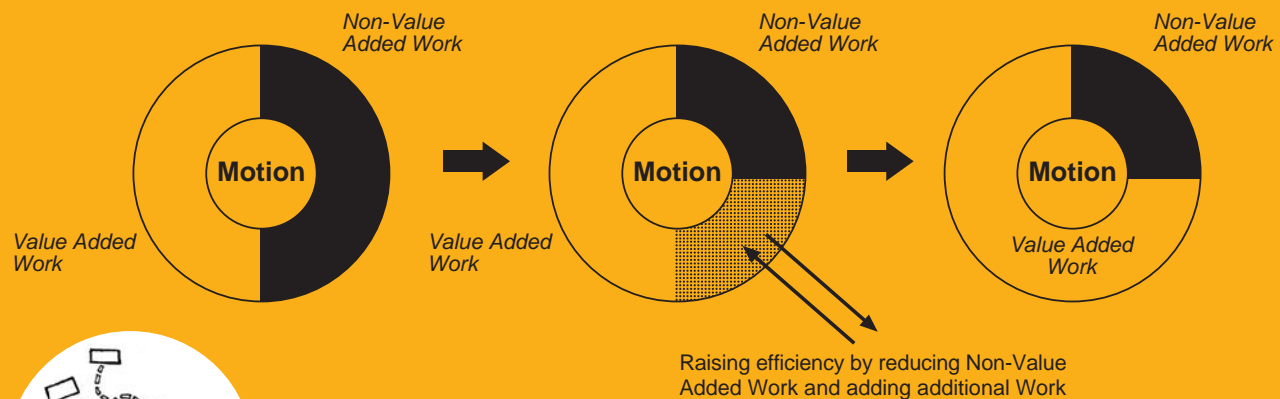
Some of the key principles of "lean" includes the elimination of waste, and the creation of value added work and efficiency.

### Waste of:

- a) Overproduction
- b) Defective Workmanship
- c) Excessive effort
- d) Excess inventory
- e) Waste of conveyance
- f) Waste of motion
- g) Waiting



### f) Waste of Motion



# It requires the matching of a LEAN PRODUCTION PROCESS to a LEAN CONSUMPTION PROCESS

## Traditional system

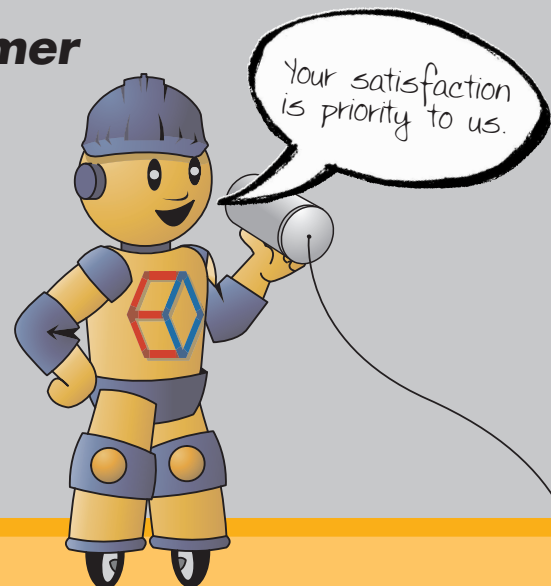
Starts in factory → Ends with customer

- Production plan based on demand
- Material procurement to meet production plan
- Material receipt & inspection
- Storage of materials & components (Until required for processing)
- Actual production on various stations with stress on maximising production
- Assembly, final inspection & packaging
- Storage of finished goods



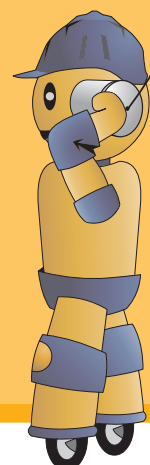
## Closing the gap between customer & factory

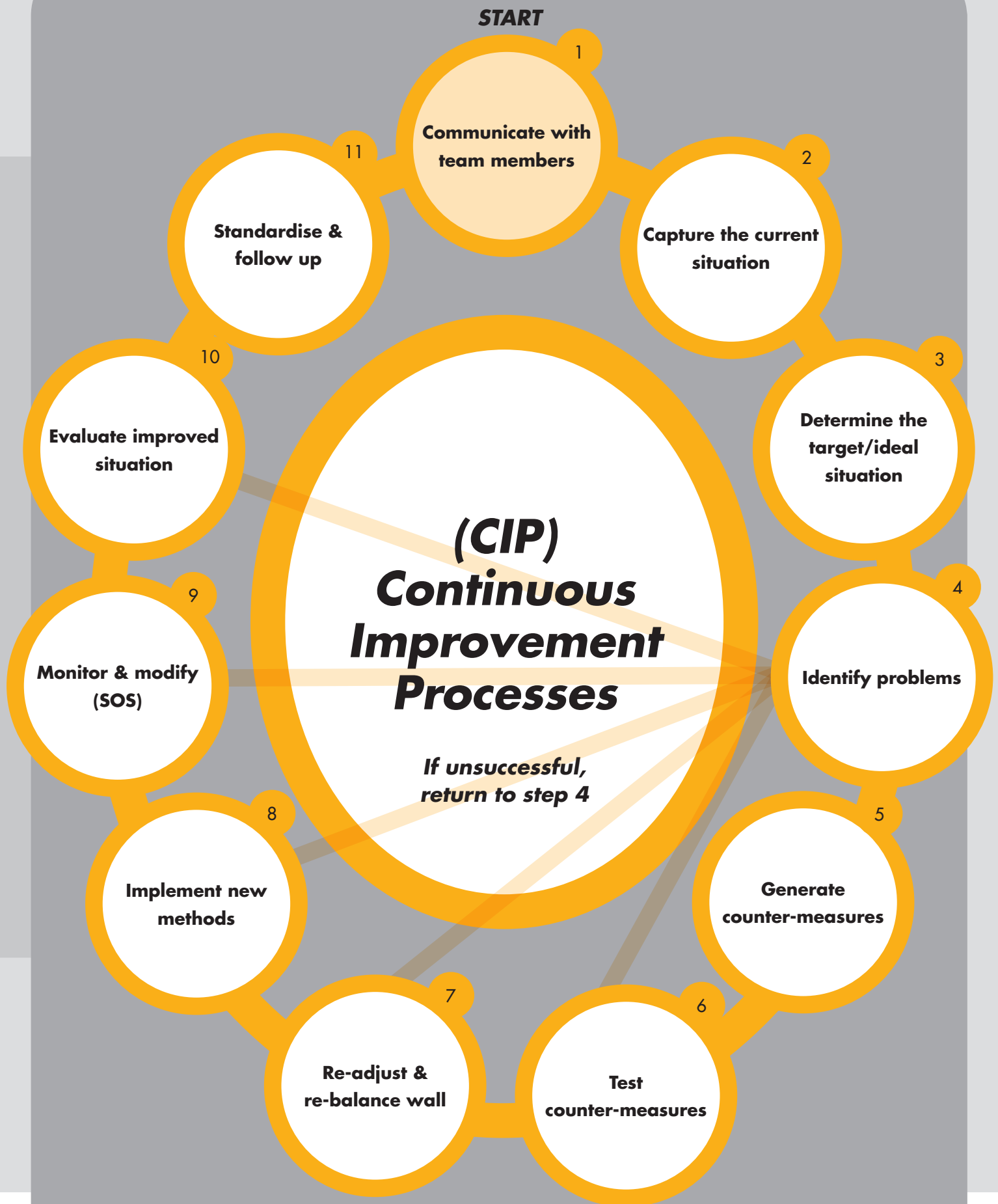
- Begins at home
- Home is the market of sale, the place where the customer lives
- Manufacturers to think forward from the order point and shipping dock rather than backward through the factory & value stream
- Is most important and feasible in home market of manufacturers
- Is a critical challenge for future success



## Global CUSTOMER Requirements for Lean Manufacturing

- **"Solve my problem completely"..... 1st Rule**
- **"Don't waste my time"..... 2nd Rule**
- **"Provide exactly what I want"..... 3rd Rule**
- **"Exactly where I want"..... 4th Rule**
- **"Exactly when I want"..... 5th Rule**





## Technical info

Systems : Ø27mm & Ø28mm & Ø28.6mm

### Benefits

Enza is the safe, economical solution.

- **Enza gives you the competitive advantage by being:**

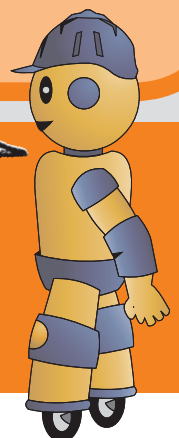
- light and strong
- quick and simple to assemble
- adjustable
- re-usable in other applications
- safe (no welding or grinding)
- rust-protected
- maintenance-free
- widely applicable.



- **Enza systems promote continuous improvement in industry.**
- **Enza systems reduce waste by up to 90% through tailoring for pin point parts presentation.**
- **Enza systems minimise downtime by allowing quick production installations and modifications.**
- **Enza systems reduce stock damage.**
- **Enza systems enhance safety and housekeeping and improve worker ergonomics.**
- **Enza systems require no special skills or tools for assembly or modification.**
- **Enza systems support the quick response to improvement.**
- **Enza systems support standardisation and visual management.**
- **Enza systems reduce inventories and buffers.**
- **Enza systems make low production runs more cost-effective by using accurate fixtures.**



No sweat!  
Working smarter  
not harder





## Connector coating

**Joints :** Connector strengths are between 180 kg and 400 kg.

Electrocoating, is an organic finishing process that uniformly applies thin-film primers and one-coat finishes to metallic substrates. Electrocoating deposits waterborne paint onto substrates rather than metal ions. The overall process consists of four main process steps: pretreating, electrocoating, rinsing, and baking. Electrocoating reduces or eliminates volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and the generation of hazardous waste associated with conventional solvent spray application. Furthermore, when compared to conventional solvent spray application, electrocoating may reduce worker exposure to hazardous constituents, as regulated by 29 CFR 1910.

## Tube capacity specs

**Tubing :** Tube strength tests have resulted in the following specified capacities, on condition that joints are torqued to 12 Nm: (8.85ft/lbs)

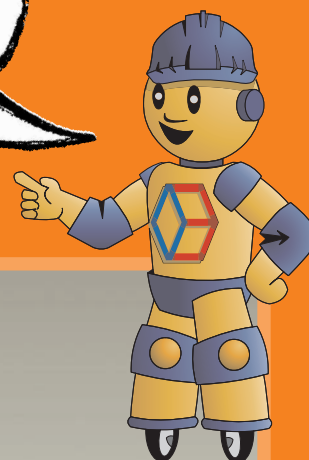
**28 mm Coated Tube x 1,2 mm Thick Wall**  
**Deflection in Millimetres (mm)**

Mass at Centre of Span (kilograms)	Span Length (metres)			
	1,00 Practical	1,25 Practical	1,50 Practical	2,00 Practical
5	1,00	2,00	2,50	7,00
10	2,00	3,50	5,50	12,00
15	2,75	5,00	8,00	19,00
20	4,00	6,00	11,00	25,00
Recommended max deflection	3,30	4,20	5,00	6,70

**28 mm Coated Tube x 2,0 mm Thick Wall**  
**Deflection in Millimetres (mm)**

Mass at Centre of Span (kilograms)	Span Length (metres)			
	1,00 Practical	1,25 Practical	1,50 Practical	2,00 Practical
5	1,00	1,00	2,00	4,00
10	2,00	2,00	4,00	8,75
15	2,50	3,20	6,00	11,00
20	3,00	5,00	7,50	15,75
Recommended max deflection	3,30	4,20	5,00	6,70

Components are measured and tested to ensure that the product is reliable and safe



## Capacities

**Strong and Capable Enza.**

**Joints:**

Connector strengths are between 180 kg and 400 kg.

**Tubing:**

Tube strength tests have resulted in the following specified capacities, on condition that joints are torqued to 12 Nm (8.85ft/lbs).

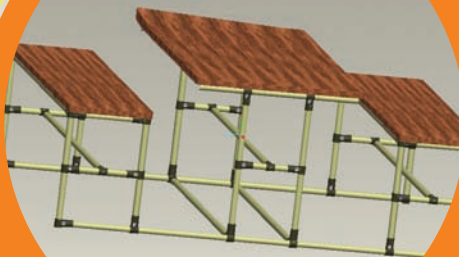
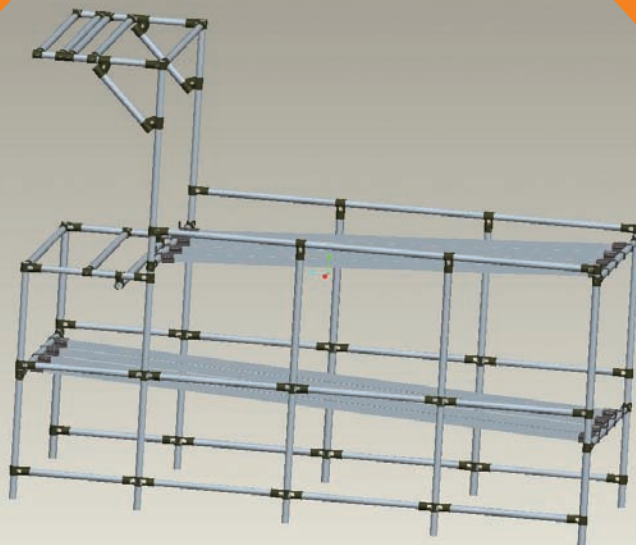
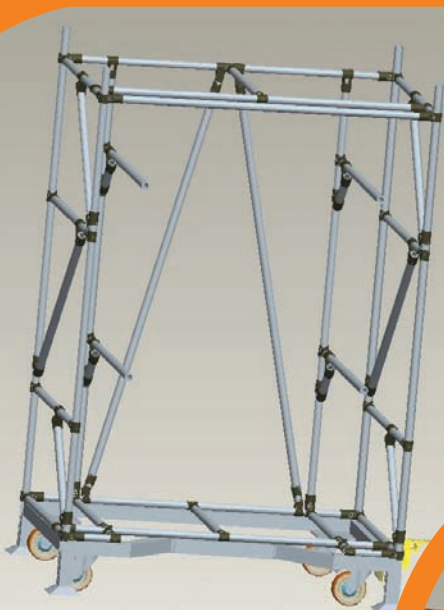
Note: During severe tests joints outlasted the tubing.

### Unsupported Length

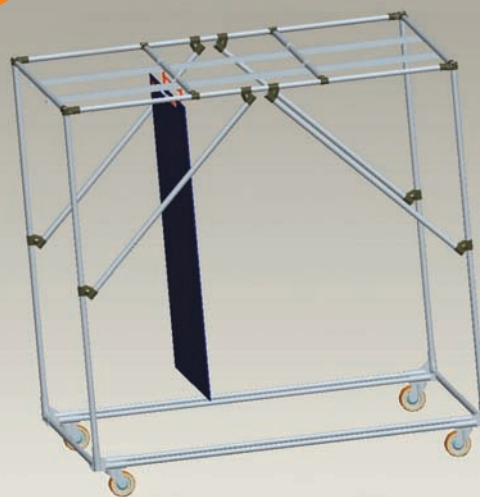
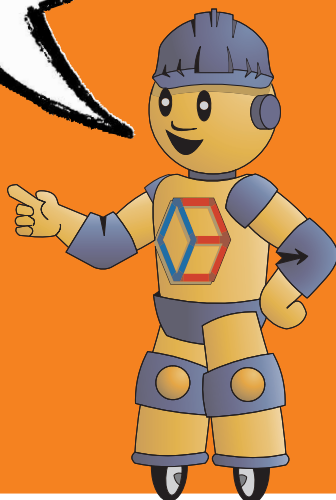
### Yield Strength (Max Load)

457mm (1'6")	345kg (761 lbs)
609mm (2'0")	257kg (566 lbs)
914mm (3'0")	176kg (389 lbs)
1066mm (3'6")	152kg (336 lbs)
1219mm (4'0")	120kg (265 lbs)
1371mm (4'6")	112kg (247 lbs)
1524mm (5'0")	104kg (230 lbs)
1828mm (6'0")	64kg (141 lbs)

***Enza specialists available to help  
with your needs***

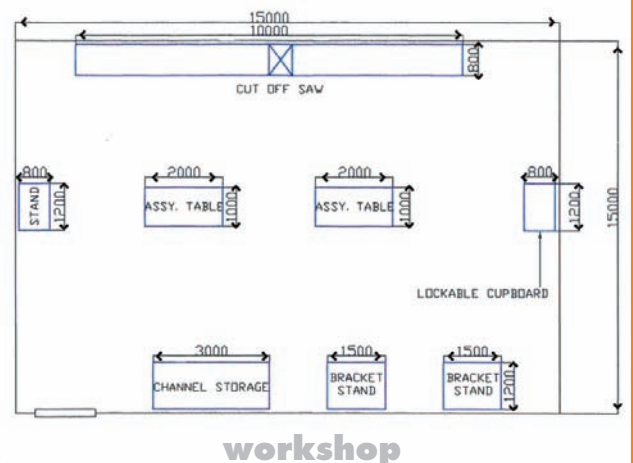
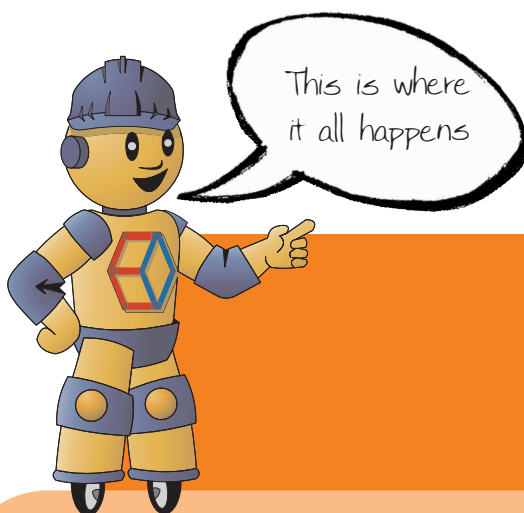


Just an  
e-mail away



## Tools and equipment, typical workshop

### Do's & Dont's in assembly



## Basic RULES and criteria for working with the Enza modular system

No matter how simple your project may be, the work will go smoother and faster, with fewer errors and less waste if a design is correctly planned and its dimensions and anticipated load carrying requirements are calculated.

### Do's

- Remember the concept is to build easy to use designs presenting parts in an ergonomic way.
- Check the dimensions of the tube before cutting.
- Get customer approval of the design or concept before processing.
- Check LOAD table in technical section to ensure supports are correct for roller tracks.
- Make sure the tube is entered into the connector correctly, to ensure maximum gripping.
- Keep the angles square in assembly, with bracing for durability.
- Always check that the reinforcement of the rack meets practical application.
- Check that the impact loading of bins is planned for in the design.
- Make sure the base design is correct for the application in transit.
- Check that grub screws are secure on the STOP/FLOW brackets for roller track fixing.
- Make sure the gradient of the bin flow is correctly set for the average weight.
- Train yourself and build on good habits.
- If you are unsure of the design consult an Enza engineer.

### Don'ts

- Do not over-tighten the bolts in connectors.
- Ensure the working surface is clean and free of burrs.
- Do not use worn or damaged tools.
- Never force components unnecessarily.
- Height should never exceed the sum of the width and depth of the rack.
- The depth of the rack must not exceed twice its opposite.
- Never allow the rack to be used under extreme vibration.
- Do not expose the modular system to open flames, sparks or high heat sources.

