2 Proposed solution

2.1 Preliminary data

The solution adopted for the need for pallets transport detailed below, is a result of considering the following data as a starting point.

Loading Specifications:

Dimensions U.C.:

U.C.1: 800L x 1200W x 2500H

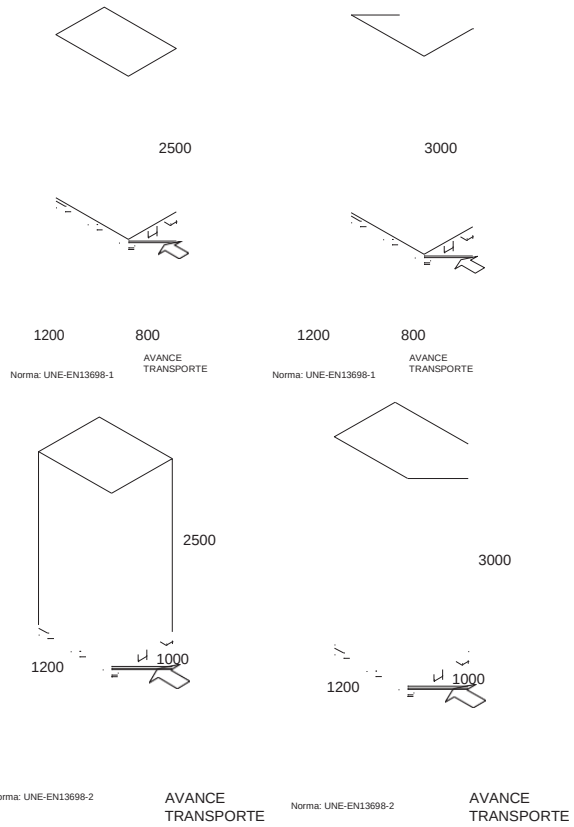
U.C.2: 800L x 1200W x 3000H

U.C.3: 1000L x 1200W x 2500H

U.C.4: 1000L x 1200W x 3000H

LOADING UNITS:

Maximum weight: 1.000 Kg.



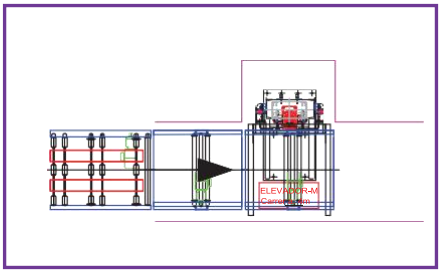
- Max weight.: 1.000 Kg

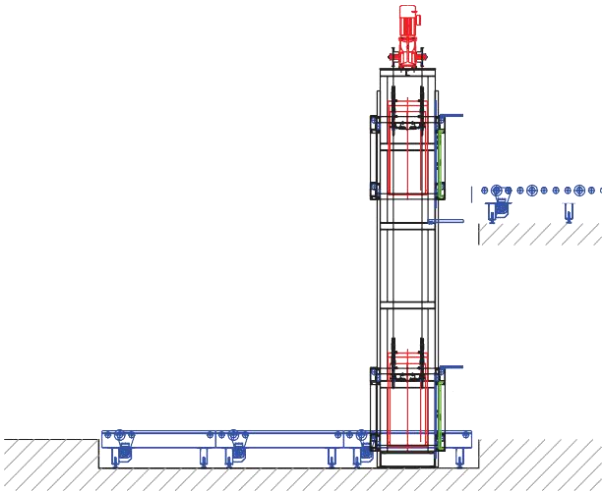
2.2 Proposed configuration

The solution proposed by ULMA Handling Systems to the need posed by Halago for the internal transport of its products is presented in the attached plan L0001 General Layout.

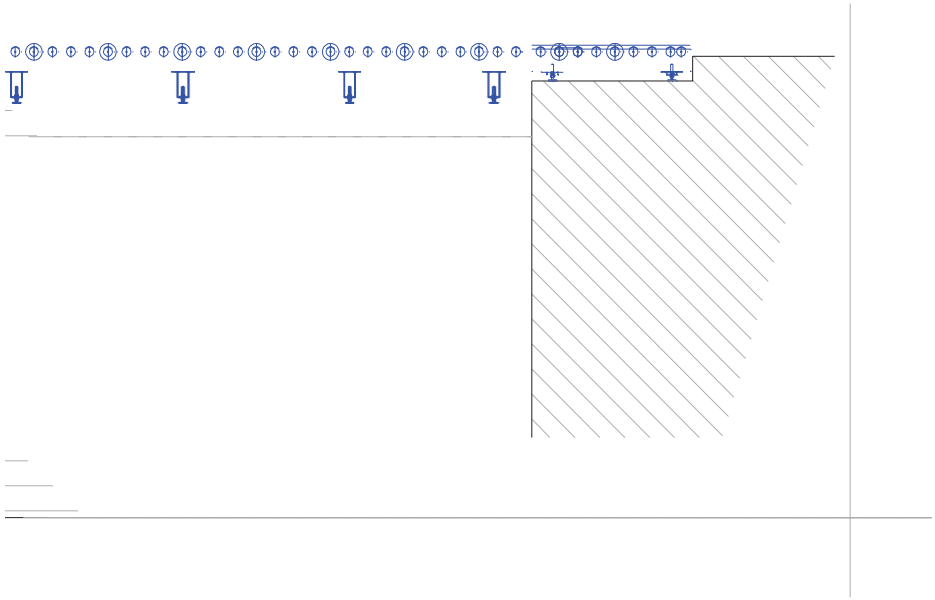
The proposed transport system will work most of the time transporting pallets from the ground floor to the mezzanine but the system will be prepared to be able to send pallets in the opposite direction, that is, from the mezzanine to the ground floor. The pallet transport system will not perform accrual function, pallets will pass from one point to another but the system will not take precedence over pallet accumulation but from one point to another.

A 2-part roller conveyor is provided at the pallet entry point of the ground floor area to allow pallets to be entered into the system by pallet truck. In order for this conveyor section to be at floor level, it is proposed to make a pit. This pit will extend to the elevator. Another option to minimize the size of the pit is to provide for a lifting table, this option is not the one that has been evaluated.





The elevator will lift the pallet to the mezzanine transport system so that it is transported to the outlet point in the mezzanine area. The lift proposed will be electric, simple (loading a single pallet) and single mast. Electric elevators are the most demanded at the industrial level and more specifically in the food sector because they are clean systems that do not generate dirt as hydraulic systems can because of hydraulic fluid leaks etc... It will be protected by fences both in the lower part and on the mezzanine, on the ground floor the elevator will have an access door for maintenance etc... In addition, in both levels of transport, the gaps through which pallets enter and exit, a barrier of photocells is provided that will prevent people from accessing the area of moving parts ensuring the risk prevention standards with which ULMA designs its Equipment.



In the pallet outlet area on the mezzanine, a unit conveyor is foreseen and it will be buried to avoid having to put lifting table.

2.3 Operative functioning of the transport system

As previously mentioned, the system will mostly work transporting pallets from the ground floor to the mezzanine but will be ready to work by transporting pallets from the mezzanine level to the ground floor.

To be able to operate in one mode or another, the system will have a selector in the pallets exit area on the mezzanine. The selector will have the "normal" operating mode or "reversible" mode for the case in which the pallets had to be transported from the mezzanine area to the ground floor. When switching to "reversible" mode, the system will empty the transport system and will not allow at the ground floor entry point to enter more pallets and enable the system to allow entries at the mezzanine entry point. Once the pallets have been introduced to the system in the mezzanine, it will be changed into operating mode in the selector so that it will no longer allow entries at the mezzanine entry point and will empty the system to be able to make entries in the ground floor.

The control system will be a "pure" PLC, all pallets have a destination and a origin.

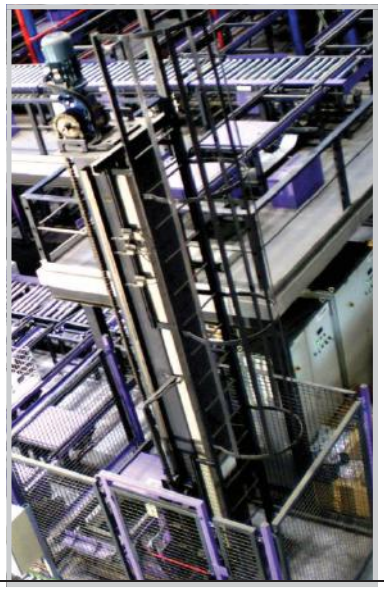
The transport system is not designed to accumulate the maximum pallets in it, the pallets will enter the system and will pass to the exit without waiting for other pallets to optimize the filling of the transport system.

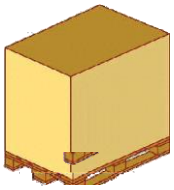
3 Product data sheets of main elements

3.1 Pallets simple lifter

TECHNICAL SPEC

SIMPLE LIFTER FOR PALLETS





DESCRIPTION

This system is used to move pallets between different levels. Pallets must meet criteria under European Standard EN 13698-2:2003.

The main structure consists of a column whit a height according to the unevenness to be connected and a base of anchorage to the ground that supports the efforts caused by the movements of the moving trolley.

On the mast the lifting trolley is moved vertically with the loading/transport element, either roller or chain conveyor. The capacity of the single lifter is for one pallet per cycle.

The lift is performed by an electromechanical system with electric gear motor and double transmission chain. The necessary energy is optimized through a counterweight. The pallet can be loaded frontly or laterally.

The conveyors will be provided with sheet metal protections against trapping, in addition, the whole set will have its own safety fence at each entrance and exit with access door for maintenance. It also incorporates accidental chain anti-break safety devices, which locks the position of the lifting trolley.

The drive group is located at the top of the elevator structure and, in compliance with the safety regulations, an access ladder is available for maintenance.

As an option the elevator can carry the duplicate drive group to increase the re delivery of the element as well as a counterweight to improve energy efficiency

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DATA SHEET

SIMPLE LIFTER FOR PALLETS

TECHNICAL DATA

Simple lifter for pallets		
Admissible load		1 pallet
• Loading unit (pallet + load)	kg	Up to 1.500
• Pallets dimensions	mm	800 x 1.200 1.000 x 1.200
• Lifting system		
Maximum lifting heights	mts	Up to 12
Counterweight		YES
Lifting by belt/cable		No
Lifting by chain		YES
Mesh type		Rollers
Passage between chain links	mm	31,75
Breaking load(dN) / Safety Coeff.	Dn	9.500
Pinion: number of teeth (Z)		25
Drum		No
• Lifting group		
Brand and Type (1v)		LENZE / SEW
Power	kw	2,2 - 11
Position		Upper chassis
Transmission/coupling type		Pinion
Includes double motorization		OPTIONAL
• Features		
Maximum speed	m/min	60
Medium speed	m/min	30
Centering speed	m/min	14
Cycles /hour		110*
• Safety		
Chain brake		Si
Carriage lock		Si
•Flow capability		
• Maximum flow	palts/h	

ADVANTAGES

- High performance
- Maximum flexibility
- Protection and safety elements as per Safety Regulations

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3.2 Roller Conveyor for Pallets

DATA SHEET

ROLLER CONVEYOR for pallets

DESCRIPTION

Element manufactured in laminated profile for the transport of pallets that meet criteria of the European Standard EN 13698-2:2003, by motorized rollers with double pinion
The drive is electric by means of a gear motor and roller-to-roller transmission chain.

The system is characterized by simplicity of maintenance.

The conveyor has sheet metal guards throughout the transmission that prevent chain entrapment.

In the necessary areas the pallet will be guided by incorporating into the conveyor a series of bushings on interleaved rollers, which act against the sides of the pallet or on the central heel of the pallet.

The position of the gear motor is internal, meaning that it does not protrude from the contour of the frame. In this way, it is protected against shocks and does not invade areas of operation that could be annoying, without harming maintenance operations.

To make final assembly as easy as possible, the conveyors come out of the factory with an electrical pre-installation that will be completed by connecting to your C-Box control cabinet using quick-connect wiring and running the necessary power supply.

ULMA

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DATA SHEET

ROLLER CONVEYOR FOR PALLETS

TECHNICAL DATA

Roller conveyor por pallets				
• Loading unit (pallet + load)		Up to 1.200	Pallets dimensions	Up to 1.500
• Admissible load		from 1 to 4 pallets	de 1 a 8 pallets dimensions	from 1 to 4 pallets
• Pallets dimensions	mm	800x1.200 1.000x1.200	1.000x1.200 1.200x1.200	1.000x1.200 1.200x1.200
• Structure				
Manufactuted structure		Laminated Steel profile	Laminated Steel profile	Laminated Steel profile
• Transmission chain				
Transmission type		Chain	Chain	Chain
Chain size		roller to roller	roller to roller	roller to roller
Chain type		10-B1	10-B1	10-B1
• Rollers		Simple	Simple	Simple
Diameter	mm	DIN-8187	DIN-8187	DIN-8187
Passage between rollers	mm	Ø80	Ø60	Ø89
• Drive unit		167	103,2	167
Transmission type		Electric motor	Electric motor	Electric motor
Powers	Kw	0,37 - 1,1	0,37 - 1,1	0,55 - 1,5
Motors		LENZE / SEW	LENZE / SEW	LENZE / SEW
• Speed				
Transport speed	m/min	9-24	9-24	9-24
• Conveyor length	mts	Up to 6	Up to 6	Up to 6
• Maximum flow	pal./h	410	410	410

- High flexibility
- Easy to maintain
- Low noise emission
- Easy assembly of accessories (tops, photocells, etc.)
- Protection and safety elements as per Safety Regulations
- High Performance
- Electrical pre-installation for connecting to the C-Box with high-speed connections.

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4 Economic Study

Budget Nº	EP14-000413

TRANSPORT SYSTEM FOR PALLETS OF 800/1000W X 1000L X2000/2500 H AND 1.000 KG. MAXIMUM WEIGHT ***(Plan L0001 Lay out general)***

4.1 AUTOMATIC INSTALLATION

1) Transport system

. Motorized rollers conveyor L= 6.000mm	8 units.
. Motorized rollers conveyor L= 1800mm	2 units
. Single mast electric lifter	1 unit
. 2-part rollers conveyor	2 units

)

2) **Safety fences** with access doors to the lifter 2 units

with emergency stop at the opening.

3) **Power and control cabinet** (1 unit)

4) PLC control software

5) Installation and setting up