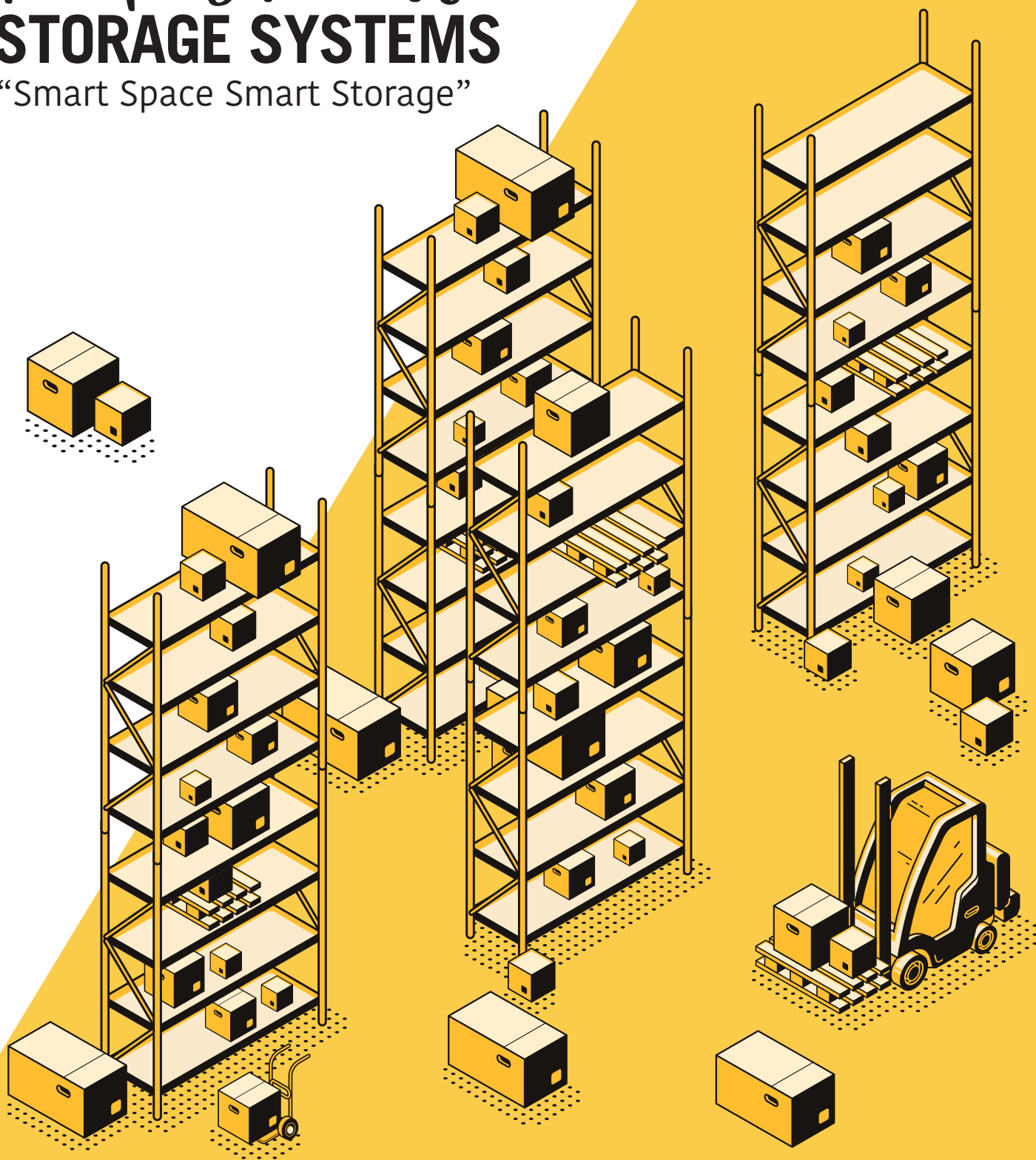




# Industrial STORAGE SYSTEMS

“Smart Space Smart Storage”



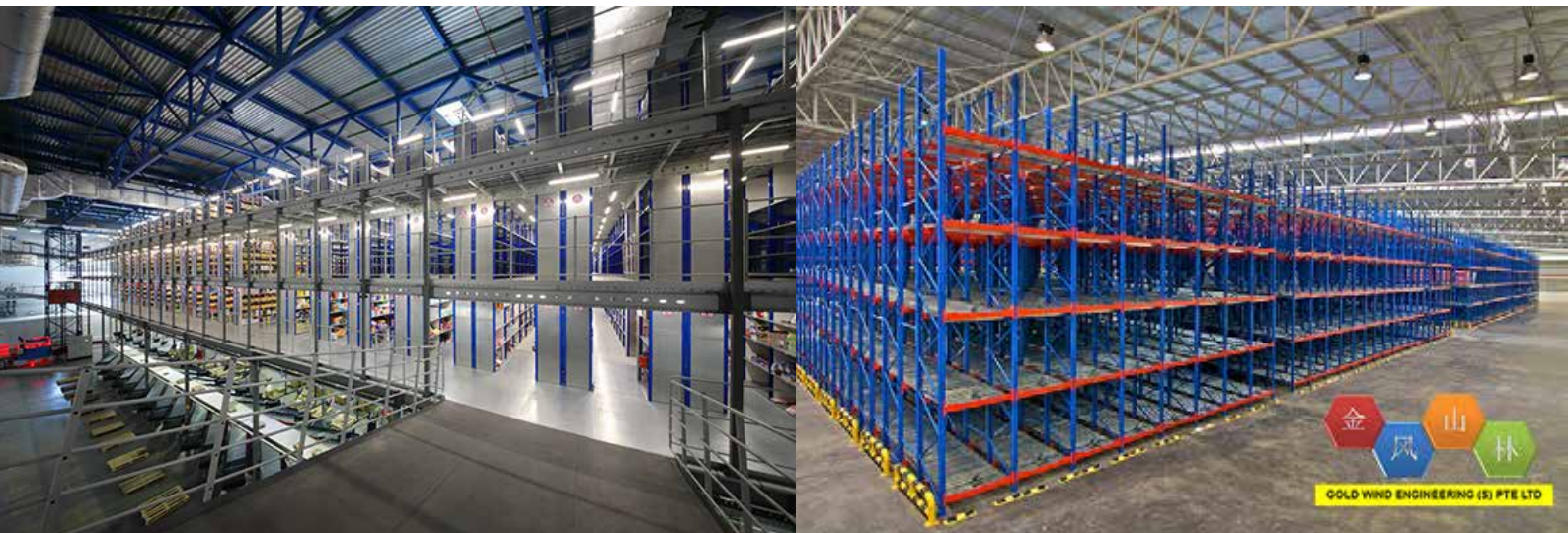
# Content

## Page

1	Introduction
2	Selective Racking
4	VNA Racking
5	Drive-in Racking
7	Shutter Racking
10	Pallet Flow Racking
12	Carton Flow Racking
13	Cantilever Racking
14	Push Back Racking
15	Multi Tier Racking
16	Sigma Mezzanine Floor
18	Medium Racking

## Page

20	T Post Shelving
21	Pallet Tainer
22	Boltless Shelving
23	Part Box Rack
24	Fencing System
24	Longspace Shelving
24	Mobile Ladder Trolley
25	Roll Container
25	Pallet Mesh
26	Mobile Compactor Shelving
27	Rack Inspection
29	Automated Storage System





# Introduction



Gold Wind Engineering (S) Pte Ltd is the Design, Fabricate & Build Organization based located in Singapore & Malaysia. Offering its customers total storage solutions with advance design, reliable engineering, Top notch manufacturing and highly effective project management.

Gold Wind designed products and services reach out to an extensive market industrial within Singapore & Malaysia project. Our services from site survey, engineering designed, structure calculation work procedure, coating, project installation and management. These important activities have been provided in policy. Customer success and satisfaction is standing in Gold Wind team mind in helping our customer to the new and better logistics result by finding solution to save operation cost and gain more profit.

## Our Core Services

- Supply Storage Racks
- Customised Design
- Roll Container Trolley
- Mezzanine Floor Design
- Structural Inspection
- Upgrade Design
- Engineer Structural Calculation
- Automation Design Project
- Warehouse Handling Equipment.
- Special Design Fabrication Work

金风工程(新)有限公司位于新加坡和马来西亚，是一家提供设计、制造和安装储存货架的企业。以先进的设计，可靠的工程技术，一流的制造和高效的项目管理，为客户提供全面的货物库存方案。

金风设计的产品和服务广泛地涉及新加坡和马来西亚市场。我们的服务包括现场勘测，工程设计，结构计算，涂层，项目安装和管理。金风团队会寻找解决方案，帮助客户获得更好的物流运输，节省运营成本并获得更多利润。

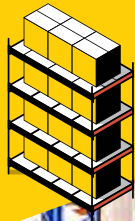
## 我们的核心服务

- 供应存储架
- 定制设计
- 滚动集装箱手推车
- 阁楼架构设计
- 结构检查
- 升级设计
- 工程师结构计算
- 自动化工程设计
- 仓库处理设备
- 特殊设计制造工作





# Selective Racking



This system suits to store various types of goods. Our structure is designed to be strong for the very heavy weight goods, suitable to use as customers can select storage positions easily and no limitation for the pallet used in industrial factories, warehouse for stocking or storing raw materials waiting for dispatch.

这个装置适合存放各类物品。我们的设计结构坚固，适用于非常重的物品，客户可以轻松选择库存位置，货盘的使用不受限制，能存货或着存放等待派送的物品。

## Advantages of Using

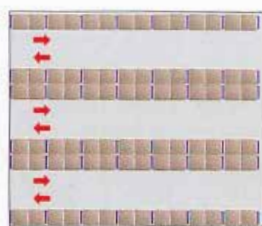
- Suitable for laying goods on pallet
- Various types of goods and heavy loaded
- Load per level up to 4000kgs
- Double-deep storage increase warehouse capacity by up to 30% compared to single-deep storage

## 使用的优点

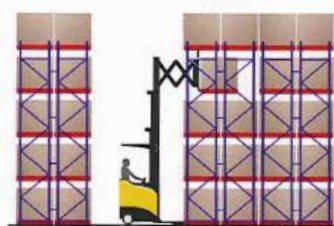
- 适合在货盘上铺设货物
- 承载各种重装的货物
- 每层能承载高达4000kgs
- 双倍的仓库库存量，增加高达30%的储存空间



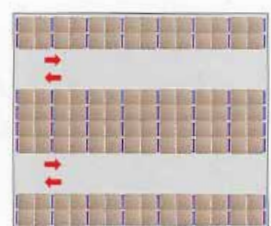
Traditional Forklift



Single Deep Layout



Double Deep Forklift



Double Deep Layout





OMEGA UR90 POST  
50/70/90/115  
Thickness : 1.6/2.0/2.5mm



Horizontal Brace  
1.5mm

Diagonal Brace  
1.5mm

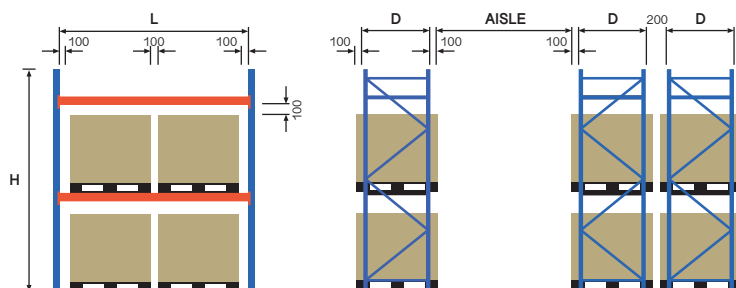


SINGLE BOX BEAM  
50/80/90/100/120/140  
Thickness 1.6/1.8mm

DOUBLE BOX BEAM  
180/200/240/280  
Thickness

## Racking Components

- |                     |       |
|---------------------|-------|
| 1 Rack Frame        | 货架柱片  |
| 2 Row Spacer        | 隔离杆   |
| 3 Base Plate        | 底盘    |
| 4 Box Beam          | 横梁    |
| 5 Connector         | 连接器   |
| 6 Shelf Support Bar | 货架支撑杆 |
| 7 Upright Protector | 直立保护器 |
| 8 Protector Barrier | 保护者障碍 |
| 9 Wire Mesh Decking | 网格层板  |
| 10 Steel Shelf      | 钢层板   |
| 11 Plywood          | 木层板   |



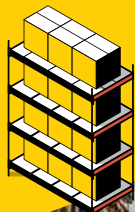
## Standard Dimension

Depth (D) : 600, 900, 1200mm  
Length (L) : from 1250mm to 3900mm  
Height (H) : from 1800mm to 12000mm

Note: Others size available on Project.



# VNA Racking



VNA racking is the selective racking with the driving lane that is reduced to 1.5~1.8m to gain more space to store the goods up to 50% more comparing to the general selective racking system stock height can be made up to 14m so it suitable for warehouse which required bigger storage capacity, VNA Racking work well with the VNA Truck which is the narrow aisle driving truck with the guide rails.

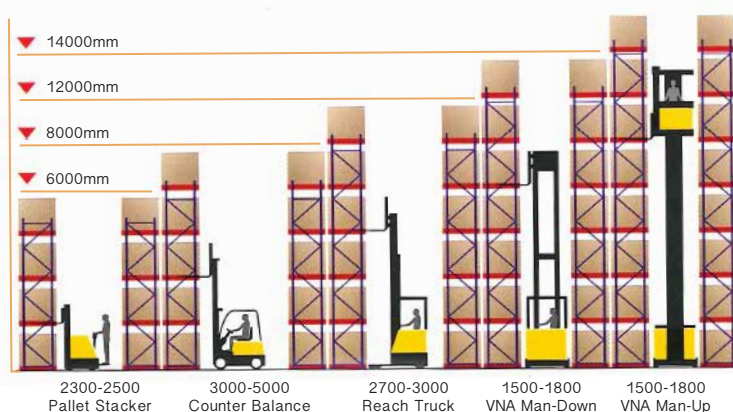
窄巷道货架是选择性货架，其行驶车道减少1.5~1.8米，以获得更多的空间存放高达50%的货物，与一般选择性货架系统相比，库存高度可达14米，因此适合存储容量大的仓库，窄巷道货架与窄巷道卡车一起使用。

## 使用的优点

- 适合存放多种类型，体积大的商品
- 比传统货架更好的利用地板空间
- 满足货品先进先出要求
- 与其他系统相比，窄巷道货架的投资更低

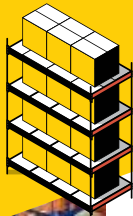
## Advantage of Using

- Suit for storing goods that has many type and has a big volume
- Better floor utilization than conventional selective racking
- Meets the FIFO requirements
- Low investment in rack compare to other system





# Drive-in Racking



Suitable for one sort of goods with large quantity. Type of storage: same kind of goods at same row. This system is serve as First-In, Last-Out (FILO) which means first storing goods will be last de-store.

## Advantage of Using

- Providing higher density storage capacity
- Higher floor space utilization
- Suitable for storing the big volumn goods with high turnover
- Low cost investment comparing with the storage capacity

适用于大批量的同一种商品。储存类型：同类型的产品在同一排。该系统用作先进后出（FILO），这意味着先入库的货物将被最后一次出库。

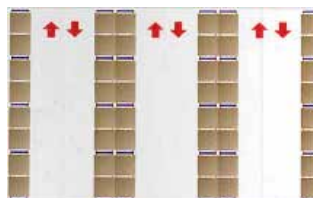
## 使用的优点

- 提供更高的密度存储容量
- 更高的占地面积利用率
- 适合存放大宗货物，营业额高
- 低成本投资

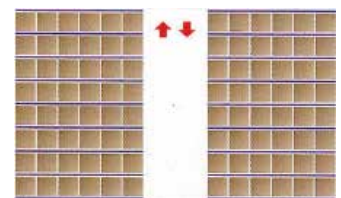


Front View

Side View



Selective Layout

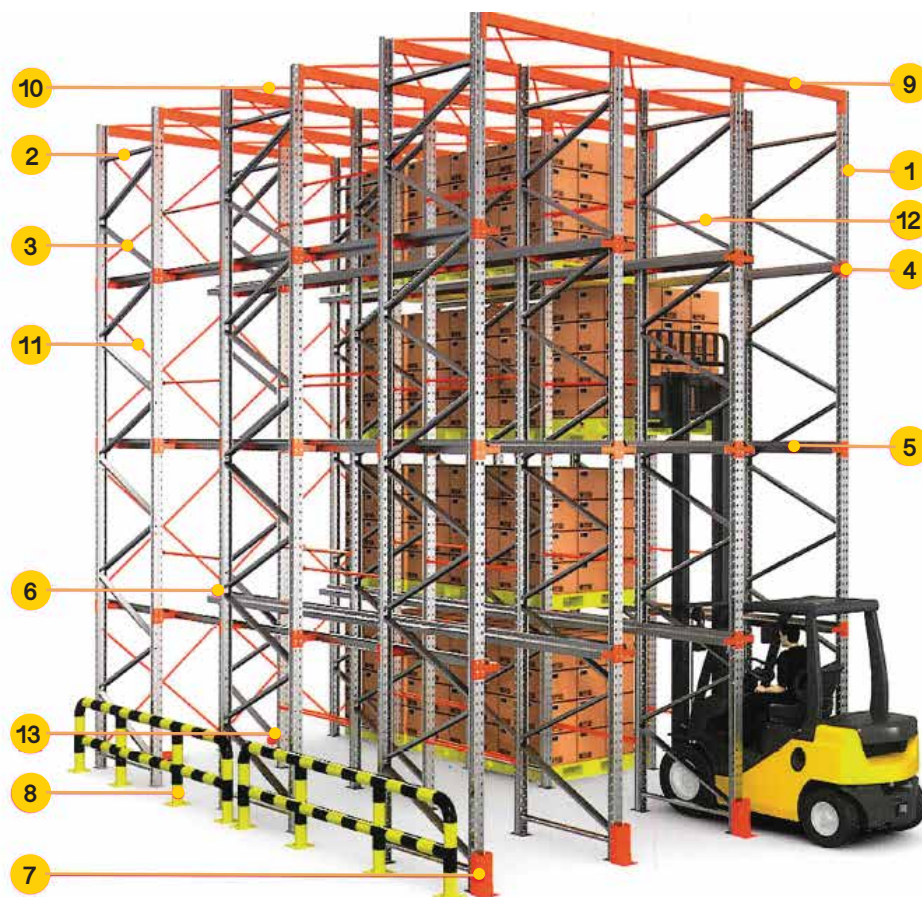


Drive-in Layout



In the same space, selective racking can store approx 80% less product than a more efficient Drive-In Racking.





SINGLE SIDED ARM  
Thk. 3mm



PALLET RAIL (GI)  
Thk. 2.5/3mm

DOUBLE SIDED ARM  
Thk 3mm



HOR. BRACE  
1.5mm

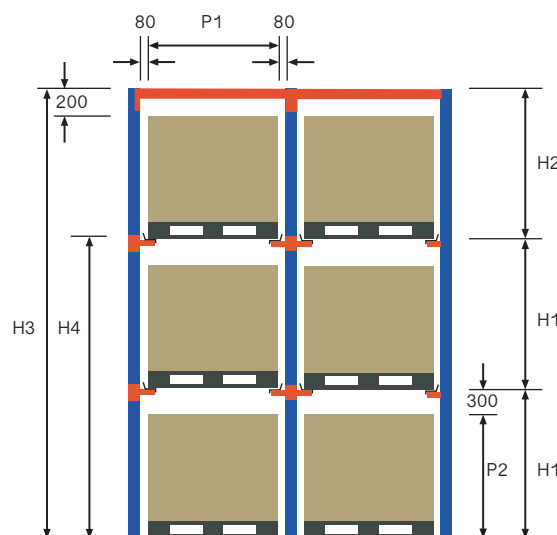
DIA. BRACE  
1.5mm



## Racking Components

## Drive-in Racking Parameters

- 1 Column
- 2 Hor. Bracing
- 3 Dia. Bracing
- 4 Bracket Arm
- 5 Pallet Rail
- 6 Pallet Stopper
- 7 Post Protector
- 8 Wall Protector
- 9 Top Beam
- 10 Top Bracing
- 11 Back Bracing
- 12 Between Bracing
- 13 Pallet Stopper



P1: Pallet Width (1200mm = minimum size)

P2: Pallet Height

H1: Pallet Height + 300mm

H2: Pallet Height + 200mm

H3: Frame Height

H4: Max forklift reach

H1, H2 and H3 must always be multiples of 75mm



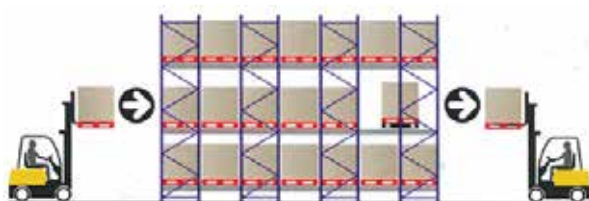
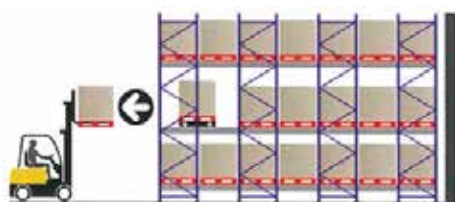
# Shutter Racking



Shutter Racking is a new innovation of Semi-Auto Warehouse Management that can store up to 90% of the total area. With the usage of Shutter Car that can be controlled by the remote unit. This process of taking cargoes in and out from the rack can be speedy and accurately with the position control system.

## Advantage of Using

- Can store up to 90% of the storage space
- Can store with both First-in, First-out (FIFO) and Last-in, First-out (LIFO) system
- Can reduce craches between forklift and rack

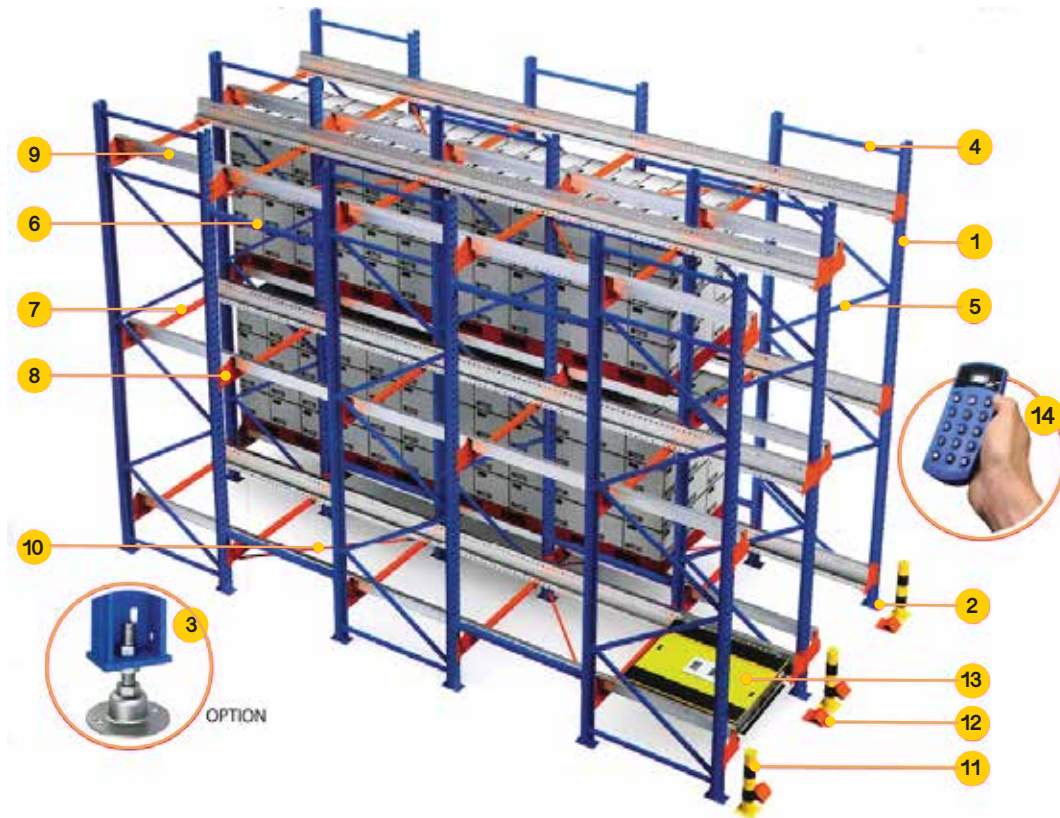




## High-Density Storage Comparision

	Drive-in	Push Back	Pallet Flow	Shutter Rack
Low Investment	✓			
High Floor Utilization	✓	✓	✓	✓
High Volumn Utilization	✓	✓	✓	✓
Skill Labor			✓	✓
Good at individual pallet access		✓	✓	✓
FIFO can be obtained			✓	✓
Good at handling mixed articles		✓		✓

✓ Best Option  
 ✓ A Good Option



## Racking Components

- 1 Column
- 2 Floor Plate
- 3 Adjustable Foot Stand
- 4 Horizontal Bracing
- 5 Diagonal Bracing
- 6 Row Spacer
- 7 Supported Beam
- 8 Rail Bracket
- 9 Rail
- 10 Lateral Bracing
- 11 Post Guard
- 12 Forklift Stopper Plate
- 13 Shutter Car
- 14 Remote Control

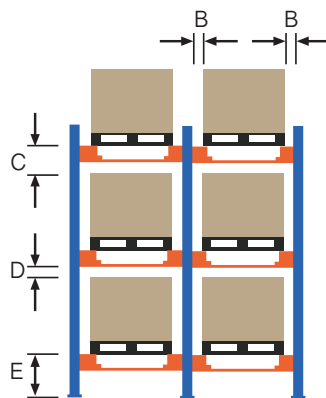
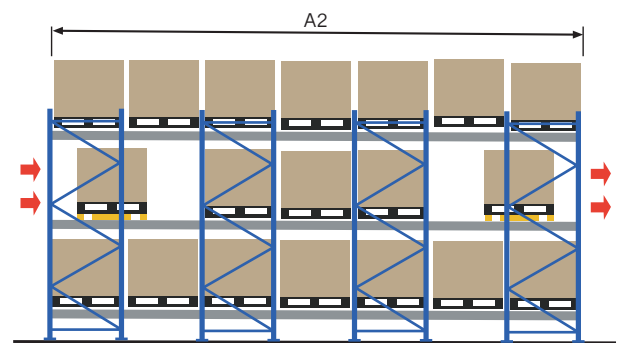
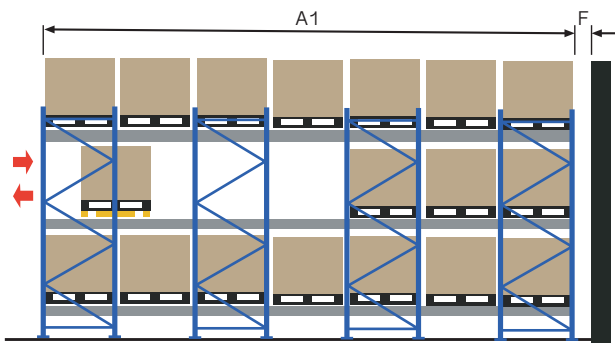


Able to modify the traditional Drive-in Rack to work with the Shutter Cars



## Shutter Car Specification

Category	Value	Category	Value
Rated Load Capacity	≤ 1500kg	Battery Capacity	26V / 60A
Speed without Load	1.0 m/s	Battery Duration	≥ 8 hours
Speed with Full Load	0.8 m/s	Charge Time	≤ 7 hours
Battery Type	LiFePO4	Remote Distance	100m



## Shutter Racking Parameters

### Depth of LIFO

$$A1 = 300 + (n \times (\text{Pallet Depth} + 20)) \text{ mm}$$

### Depth of FIFO

$$A2 = 300 + (\text{Pallet Depth} + 20) + 300$$

$$B = 75\text{mm (min clearance)}$$

$$C = 335\text{mm (min clearance)}$$

$$D = 60\text{mm (min clearance)}$$

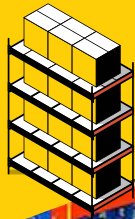
$$E = 400\text{mm (lowest level)}$$

$$F \geq 150\text{mm}$$





# Pallet Flow Racking



GOLD WIND ENGINEERING (S) PTE LTD

The best solution for the storage of products which required perfect rotation based on the FIFO (First in, First out) basis.

The loading is transported on rollers which come from advanced technology, for smooth operation, another advantage is that it can utilize most of the available space to the highest with minimum cost of forklift and manpower.

## Advantages of Using

- Can store up to 90% of storage space
- First in, First out inventory control
- Time and labour savings



GOLD WIND ENGINEERING (S) PTE LTD



货物储存的最佳方法是作轮回式的FIFO(先进先出)。

装载工作采用先进技术的滚轮运输，运行平稳，另一个优点是能以最低成本的工业搬运车和人力资源，作最大限度的空间运用。

## 使用的优点

- 可储存高达90%的储存空间
- 先进先出库存控制
- 节省时间和人力



Pallet Flow Racking

Case Picking From The Pallet

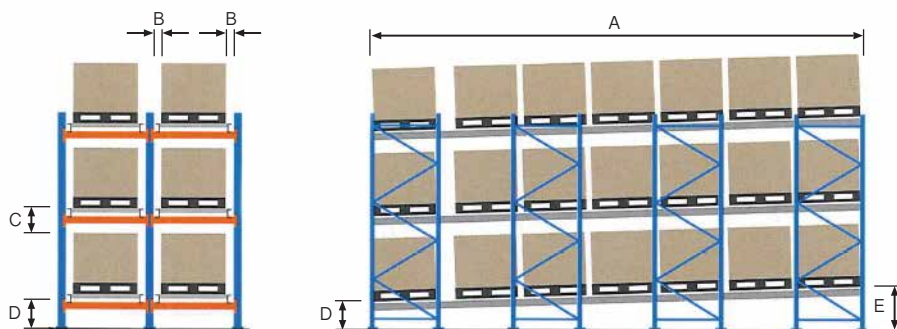




## Racking Components

- 1 Column
- 2 Foot Plate
- 3 Horizontal Bracing
- 4 Diagonal Bracing
- 5 Row Spacer
- 6 Supported Beam
- 7 Flow Rails
- 8 Rollers
- 9 Brake Rollers
- 10 Entry Guide
- 11 Safety Separator
- 12 Separator End Stop
- 13 End Stop
- 14 Forklift Stopper Plate

## Pallet Flow Racking Parameters



$$A = (\text{Pallet Depth} \times \text{Number of pallets}) + 400\text{mm}$$

$$B = 100\text{mm}$$

$$C = 400\text{mm}$$

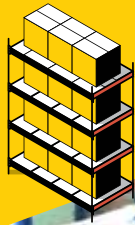
$$D = 300\text{mm}$$

$$E = \text{The usual gradient of the slope is } 4\%$$





# Carton Flow Racking



Carton flow is a type of shelving that uses a gravity feed rear-load design. Merchandise is loaded in the rear of each runway. As an item is removed from the front the item directly behind it slides forward in place of the previous one continuously.

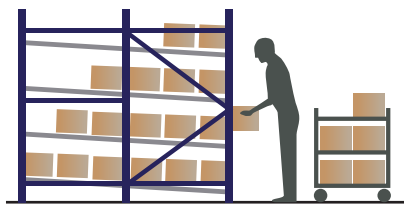
纸箱流是一种使用重力装载设计的货架，物品装在每条跑道的后部。当物品从前面移除时，其后的物品将连续向前滑动以代替前一个物品。

## Advantage of Using

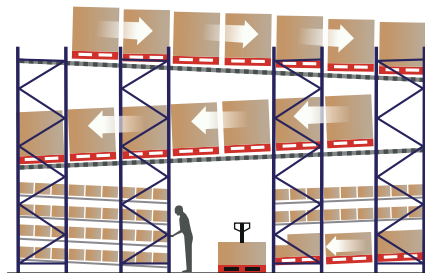
- FIFO System (First in First out)
- Support for many SKUs at the front of rack
- Reducing process time for order preparation

## 使用的好处

- FIFO系统(先进先出)
- 支持许多库存进出计量
- 缩短订单准备的处理时间



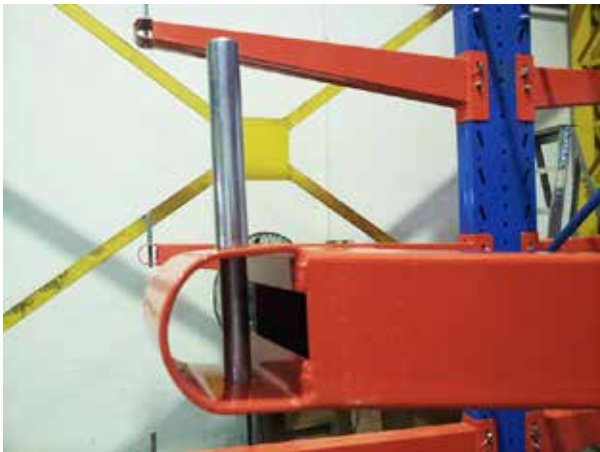
Picking from boxes



Picking from boxes & picking from the pallet



# Cantilever Racking



For storage of products that are length 6m. This is an ideal system for storing all types of lengthy profiles such as steel pipe, aluminium, wood panel, timber etc

## Advantage of Using

- Easy to assembly
- Structure of great simplicity and strength
- Single and double side options



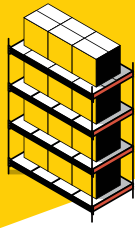
适用于存放长度为6米的产品。这个系统适用于存储所有长型物件，如钢管，铝，木板，木材等

## 使用的好处

- 易于组装
- 结构简单而有力
- 单面和双面选项



# Push Back Racking



Each level in a push back racking system holds a series of nested rolling carts which operate in a lane that slope upwards away from the pick face. This rack acquired its name because the lift truck operator lines up in front of the first pallet and pushes against it, causing the first pallet to roll away from the pick face and expose the next carts.

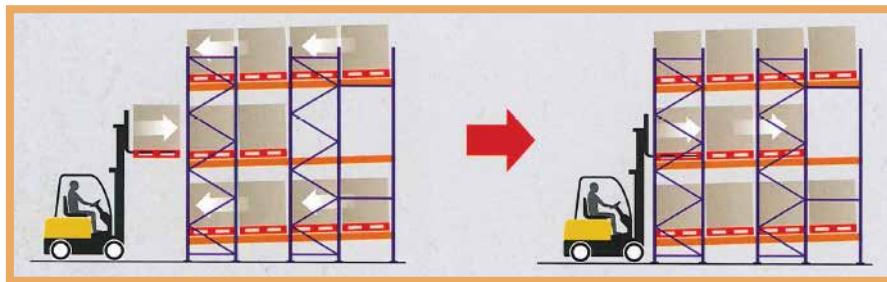
推回式货架系统中的每一层都装有一系列倾斜的滚动推车。这个货架之所以得名，是因为叉车操作员在第一个托盘前面排成一行并向其推动，导致第一个托盘从拣货面滚开并露出下一个推车。

## Advantage of Using

- Quick easy access to all storage lanes
- Maximum use of floor space
- Each level can be used to store a different SKU

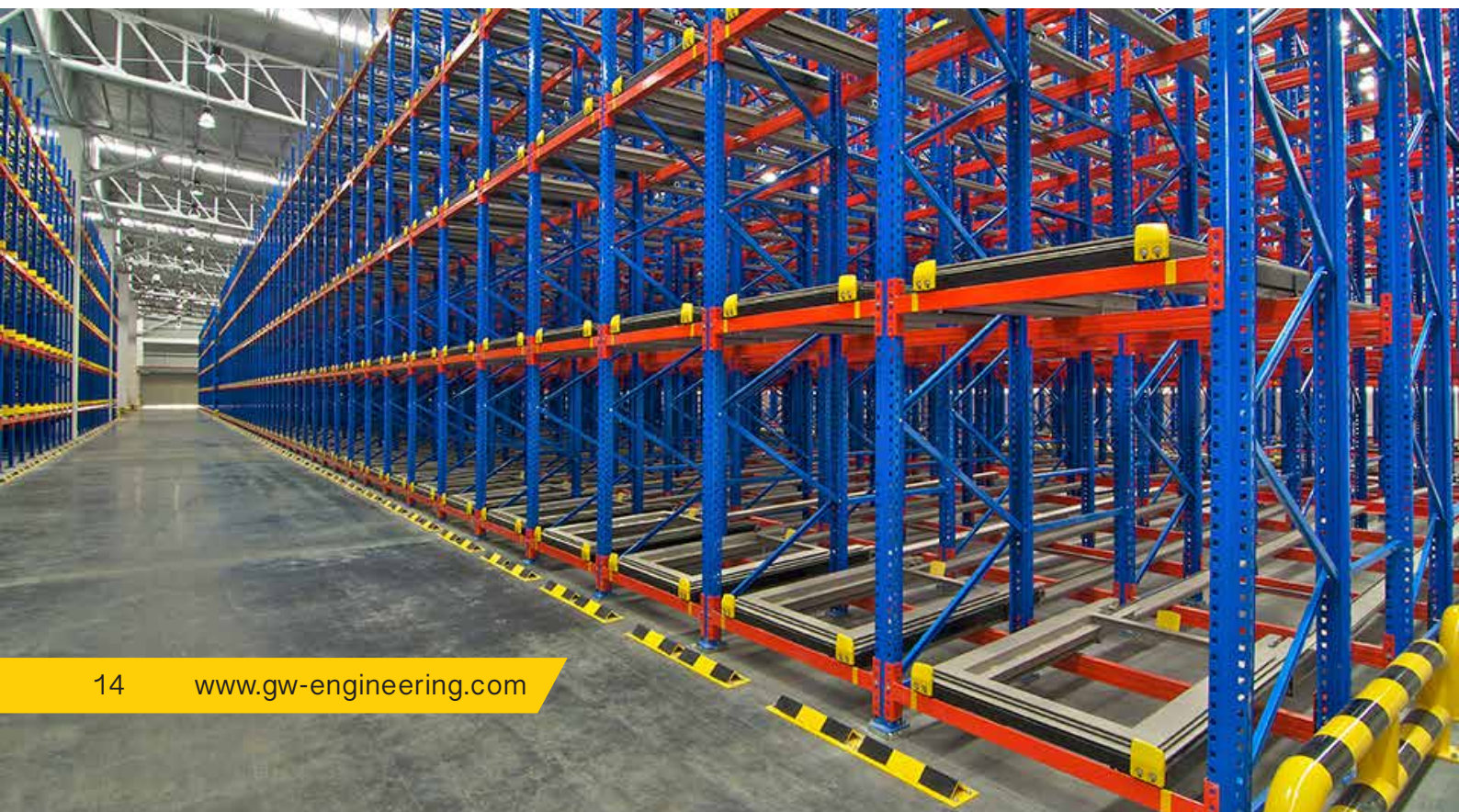
## 使用的好处

- 快速轻松访问所有存储通道
- 最大限度地利用地面空间
- 每个级别可用于存储不同的SKU



Last-in, First-out (LIFO)

Available in 2 to 4 pallets deep





# Multi Tier Racking



Ideal for businesses that need a cost effective way of creating a raised storage area for hand loaded goods that are not heavy in nature. Slow moving stock can be stored on upper level leaving the ground floor for fast moving stock items. Also it suits growing businesses that may need to dismantle and relocated the storage area in the future.

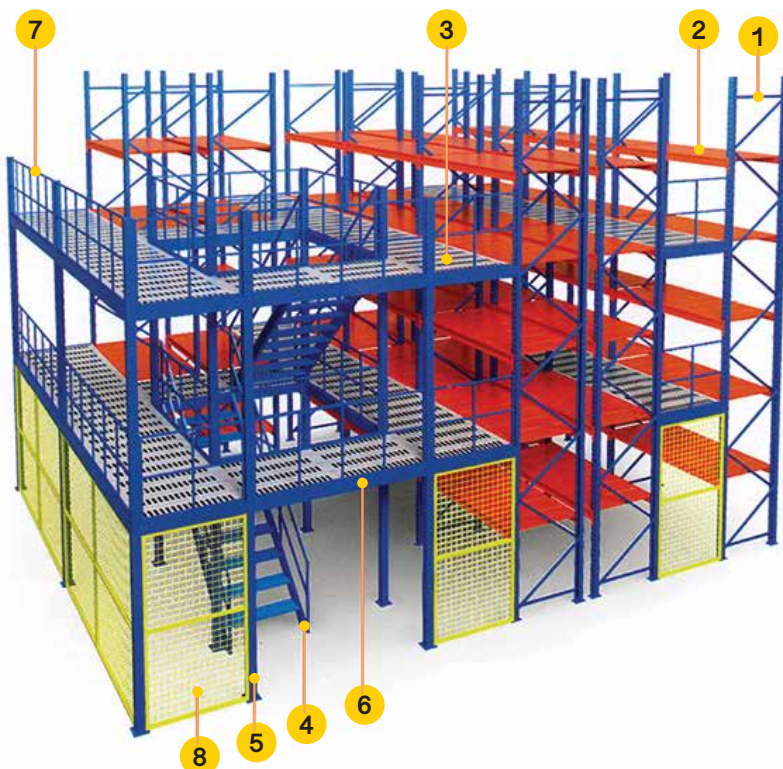
## Advantages of Using

- Utilize existing overhead space
- Can combine pallet storage & small goods storage
- Auxiliary facilities can be equipped for mezzanine rack: elevator conveying belt and etc

适合需要以经济方式创建手力卸货空间的企业。物流慢的库存可以存储在上层，底层为物流快的库存物品。此外，它适用于未来可能需要拆除和重新安置储存区域的成长型企业。

## 使用的优点

- 利用现有的上方空间
- 可以结合货盘储存和小货物储存
- 夹层机架可配备辅助设施：电梯转运带等



## Racking Components

- 1 Selective Racking
- 2 Steel Shelf Plate
- 3 Floor Grating
- 4 Staircase
- 5 Floor Support Columns
- 6 Main Support Beams
- 7 Handrail
- 8 Wire Partitions



# Sigma Mezzanine Floor



Sigma mezzanine floor structure type was designed to solved that problem with space in industrial manufacture and warehouse, able to assemble to various floor level with staircase and handrails, efficient for multi-purpose such as increase storage space in warehouse, increase area for production process of machines and equipment etc. The floor can be designed according to the weight desired.

## Advantages of Using

- Increase working space for the existing area
- Structure designed according to the engineering principle, assure the safety
- The unique designed of sigma beam mezzanine floor can be modified and mobilized easily.

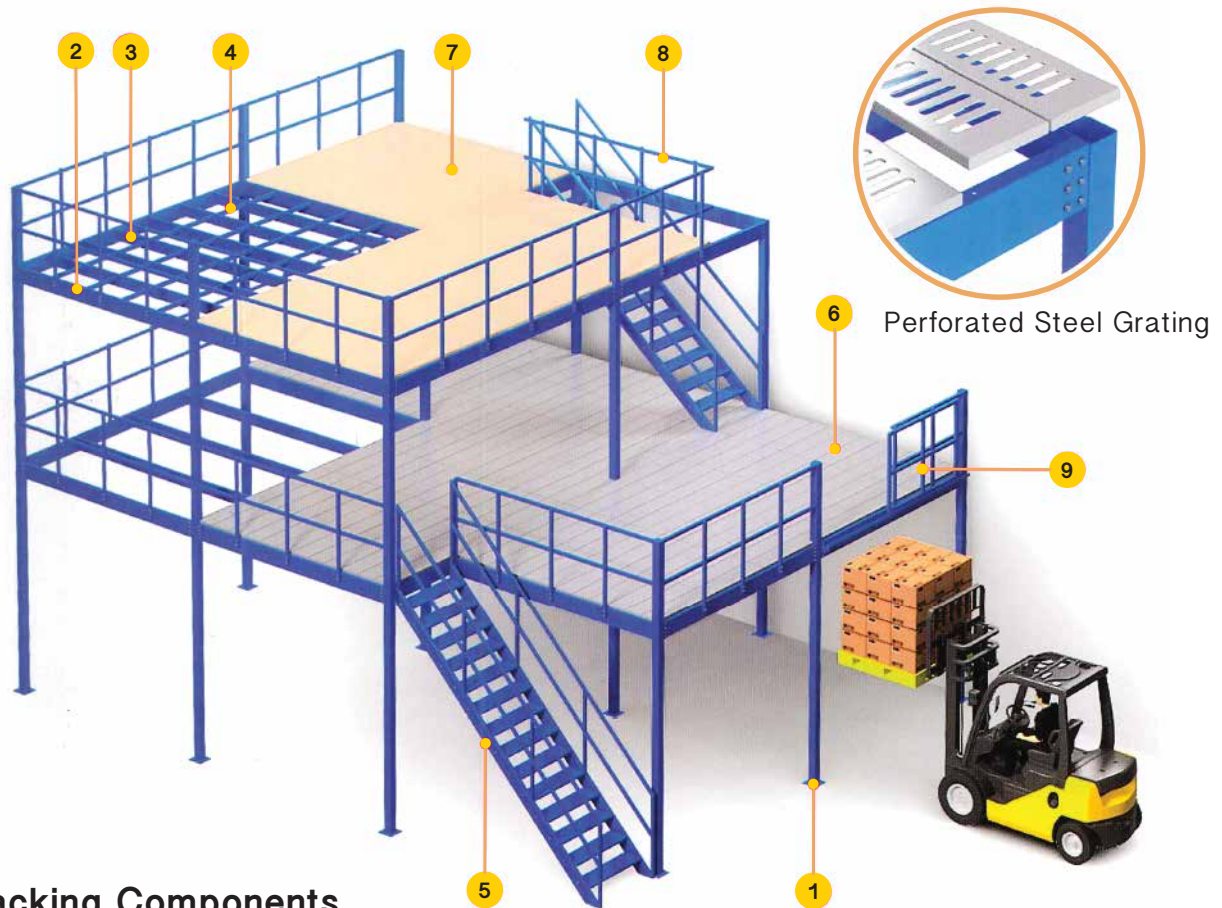
新马阁楼的结构设计用于解决工业制造和仓库中的空间问题，能够把楼梯和扶手组装到各种楼层，高效多用途如增加仓库的存储空间，机器设备的生产空间等。地板也可根据所需重量设计。

## 使用的优点

- 增加现有货仓的工作空间
- 结构按工程原理设计，确保安全
- 独特设计的新马阁楼可以轻松修改和调动

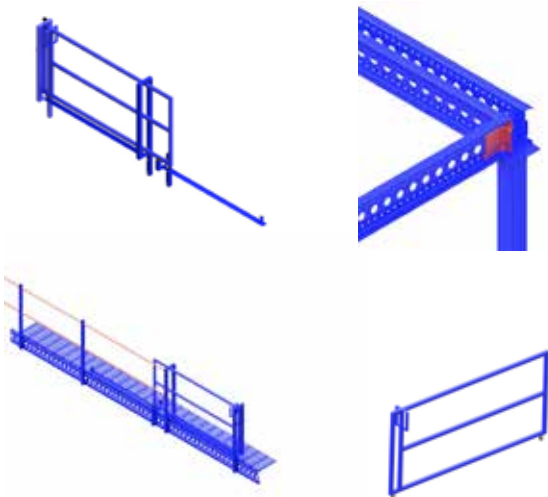






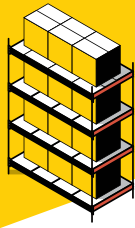
## Racking Components

- 1 Column Upright
- 2 Main Beam
- 3 Beam
- 4 Sub Beam
- 5 Staircase
- 6 Floor Grating
- 7 Plywood
- 8 Handrail
- 9 Slide Door





# Medium Racking



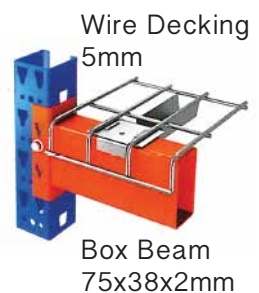
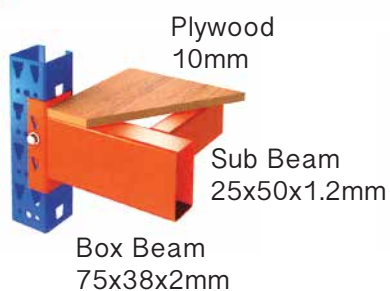
Medium Racking is the storage shelving similar to selective racking which is designed to store medium to heavy weight materials approx 300kgs~600kgs per level. It is suitable for medium size warehouse. Its shelf surface can be plywood, steel panel or wire mesh decking.

中型货架是类似于选择式货架的储物货架，其设计用于存储中等至重量级材料，每层300kgs~600kgs。适用于中型仓库。其货架表面可以是木层板或金属丝板。



## Racking Components

- 1 Frame 货架柱片
- 2 Bracing 支撑
- 3 Box Beam 横梁
- 4 Sub Beam 货架支撑杆
- 5 Plywood 木层板
- 6 Step Beam 阶梯横梁
- 7 Steel Panel Shelf 钢层板
- 8 Wire Decking 网格层板
- 9 Wire Mesh Cover 金属丝网盖



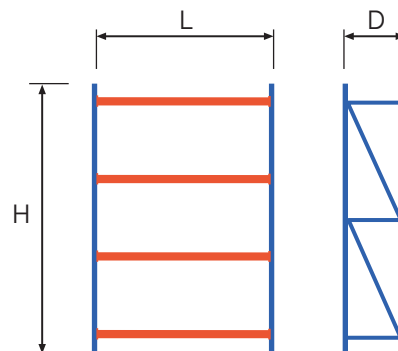




## Racking Components

- |                     |       |
|---------------------|-------|
| 1 Medium Frame      | 货架柱片  |
| 2 Steel Shelf Plate | 钢层板   |
| 3 Beam              | 横梁    |
| 4 Plywood           | 木层板   |
| 5 Column upright    | 直立保护器 |
| 6 Main Beam         | 支撑横梁  |
| 7 Staircase         | 楼梯    |
| 8 Floor Grating     | 阁楼板   |
| 9 Handrail          | 栏杆    |

## Medium Racking Parameters



### Standard Dimensions:

Depth (D) : 600-800mm  
 Length (L) : 1800-2400mm  
 Height (H) : 2000-3000mm

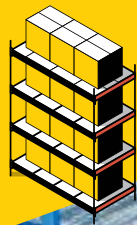
### Loading:

Load / Level : 500kg





# T Post Shelving



T Shelving is the multi purpose shelving system which can be used in any warehouses, hardware shop, vehicle spare parts storage warehouse / services center. The shelf plate can be the load of 100~200kg / Level. Able to adjust the level height to suit the size of goods storing with the clip system support shelf plate. It's knock down structure made it easily assembled.

T 系统货架是多用途货架系统，可用于任何仓库，五金店，车辆备件仓库/服务中心。搁板可承受100~200kg /级的载荷。能够调整水平高度以适应货物的存放尺寸。它的结构使其易于组装。



Shelf Support Clip System

Shelf Boltfree



## Racking Components

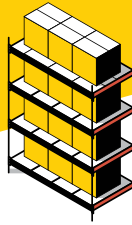
- 1 T Post Frame
- 2 Shelf Plate
- 3 Floor Grating
- 4 Handrail
- 5 Staircase
- 6 Column Upright
- 7 Main Beam
- 8 Upright Connector
- 9 Wire Mesh Panel



Join of Shelf / Upright and Bracket



# Pallet Tainer

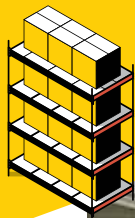


It designed to store goods having same aspects, which are often moved. As the goods can be stored in many aspects, it can save space both before and after using by overlapping storage.





# Boltless Shelving



GOLD WIND ENGINEERING

## Standard Ex-Stock Size

Height	1840mm, 2160mm, 2440mm, 3040mm
Dept	305mm, 457mm, 610mm
Length	915mm, 1220mm, 1524mm, 1829mm
Surface	HDF Board, Metal Panel
*Others size available upon request	





# Part Box Rack



The stand for storage of car parts, motorcycle parts, computer parts electronic work and etc, easy to find because of the clear structure design that the parts inside can be clearly and easily seen. Strong structure are made from Electro-Static Powder Coated steel sheet. The bin itself made of Polyethylene which is durable and has multi colours.



Jumbo Box



Part Box



Plastic Tray

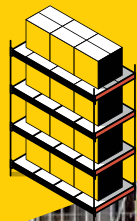


Part Box

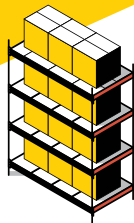




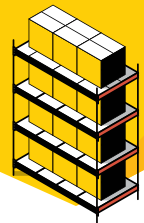
# Fencing System



# Longspace Shelving



# Mobile Ladder Trolley

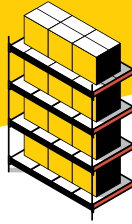




# Roll Container



# Pallet Mesh



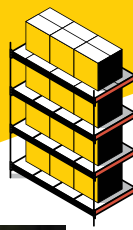


# Mobile Compactor Shelving





# Rack Inspection



## Why should we have racking system inspection?

Pallet racking is classified as 'Work Equipment' and therefore requires regular documented inspections and maintenance.

Operator error, poor housekeeping or overloading; 'DIY' repairs; lack of maintenance and failure to comply with the manufacturer's operating instructions, all contribute to seriously threaten the safety of racking structures.



## Which type of inspection service Gold Wind offer?

Gold Wind offer regularly inspection service without extra charge to our existing customer once a year. The professional inspection service includes investigation into the causes of damage results in improved operating methods, damage reduction, and help customer reduced maintenance costs without damage to existing racking system.



## How often should we have a Racking Inspection?

Normally every 6 months we recommend rack safety inspection is required.





## What's the content of inspection service Gold Wind Provided?

- Check all the components offer by Gold Wind deeply.
- Offer damage report(if any) to customer with technical data
- Check all the safety pin fully secure on load beam
- (Free 30 pcs of Safety pin replacement to Gold Wind Racking)
- Provided Safety Load Chart for every Gold Wind Customer.
- Which can help customer increase product lifetime and save cost.



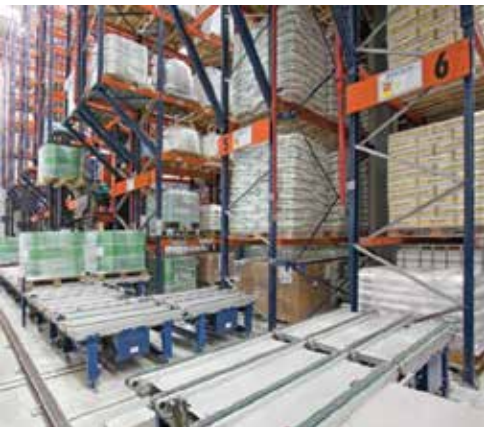


# Automated Storage System



## Conveyor systems

In high bay warehouses of this type, transporting pallets from the docking area to the rack's main conveyor circuit can be automated. The warehouse is equipped with roller and chain conveyors for that purpose. In some installations, shuttles are also used. These move the pallets to and from the rack's entry and exit points.

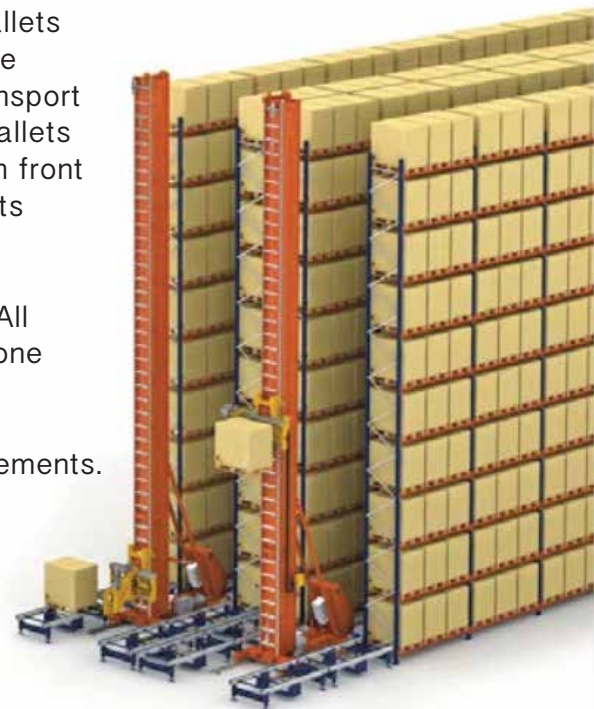


## Automatic trilateral stacker cranes

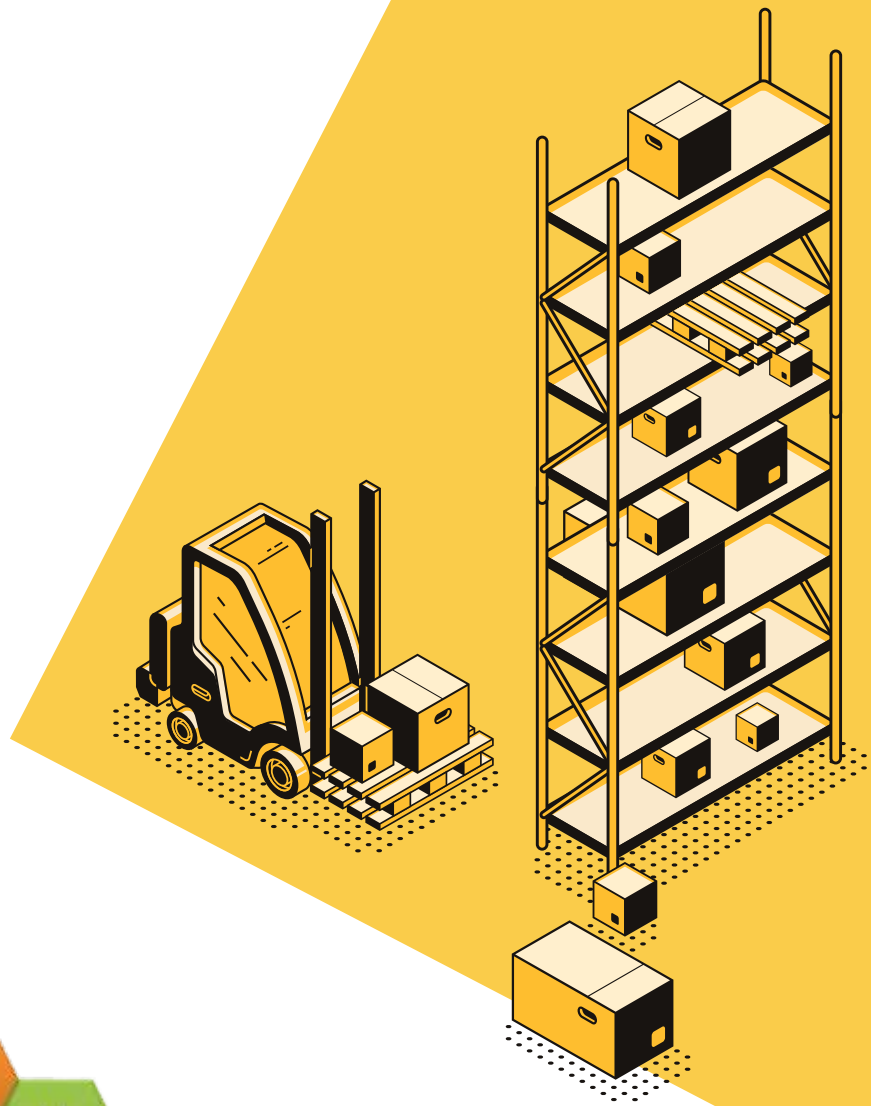
A warehouse with up to 15 m high conventional racks can be easily automated using this solution.

The stacker crane moves the pallets to the end of the aisle leaving the load on a rack or automated transport system. It picks up and leaves pallets in three different positions, i.e., in front and at either side, by means of its rotating head.

Operations are fully automated. All stacker crane movements are done according to storage or retrieval commands sent from the control system, which optimises its movements.







### **Gold Wind Engineering (S) Pte Ltd**

39 Woodlands Close Mega@Woodlands

#03-23 Singapore 737856

Tel: +65 6482 7098

Fax : +65 6482 7097

Email : support@gw-engineering.com



Whatsapp  
Singapore



### **Gold Wind Engineering & Trading**

No.20 Jalan Mutiara Emas 7/4,

Taman Mount Austin 81100 Johor Bahru, Johor, Malaysia

Tel: +607 532 1054

HP: +6019 722 6580

Email: JB@gw-engineering.com



Whatsapp  
Malaysia



**[www.gw-engineering.com](http://www.gw-engineering.com)**