Wesafe Inspection
Dare to Speak the Truth

Deliverables Insured by Insurance Institutions

WESAFE 稳图

Excellent Engineer

- Rack Engineering Inspection
- Structural Design Consultation
- Intelligent Equipment Testing
- Industry Evaluation and Certification

Dedicated to Unifying Racking Standards of China

ABOUT WESAFE

In Wesafe, we try our best to do the right thing with stability and creativity. As a leading third-party technical service provider in the warehousing equipment industry, Wesafe has a seasoned team of PhDs in structural engineering and EHS experts. We are certified with CNAS, CMA, and SEMA qualifications, covering the inspection of racks, stacker cranes, and shuttle systems. As a vice-chair member of the China Association of Warehousing and Distribution, Wesafe has led the drafting of two national standards and multiple group standards. We also collaborate with authoritative organizations to carry out industry evaluation and certification, holding over 50 patents and software copyrights. With our guiding principle "Wesafe speaks the truth," we are committed to unifying China's warehousing rack standards and driving high-quality industry development.

- Professionalism through Focus
- Adherence to authoritative standards
- Honest and proactive approach to challenges

ilac-MRA CNAS 中国认可 国际互认 检验 INSPECTION CNAS IB1145

ilac-MRA CNAS 中国认可 国际互认 检测 TESTING CNAS L19154

CMA 190908341751

APPROVED sema INSPECTOR

What Can We Do for You?

- Finite element analysis reports for rack structures
- Safety inspection reports on the usage status of racks
- Completion acceptance inspection reports for rack projects
- Unit testing reports for pallets, cantilever racks, and shelves
- Floor flatness testing reports for VNA rack aisles
- Inspection reports on rack manufacturing quality and installation precision
- Inspection reports on various parameters of the installation and use functions of the stacker crane
- Inspection report on various parameters of shuttle system installation and usage functions
- Solutions for upright verticality and floor settlement monitoring system
- CRF Personnel competency Evaluation Certificates (rack installation, design and operation)
- CQC Intelligent Warehousing Project Certification Certificates

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About CNAS

Reports bearing the CNAS mark are internationally recognized and demonstrate a company's global inspection capability.

中国认可
国际互认
检测
TESTING
CNAS L19154

中国认可
国际互认
检验
INSPECTION
CNAS IB1145


中国合格评定国家认可委员会
检验机构认可证书
（注册号：CNAS IB1145）
兹证明：
上海穗图货架安全检测技术有限公司
上海市奉贤区沪杭公路 1588 号 1 幢 2 号楼 3 楼 306 室，
201401
符合 ISO/IEC 17020：2012《各类检验机构运行的基本准则》（CNAS-CI01《检验机构能力认可准则》）A 类的要求，具备承担本证书附件所列检验服务的能力，予以认可。
获认可的能力范围见标有相同认可注册号的证书附件，证书附件是本证书组成部分。
生效日期：2023-10-07
截止日期：2029-10-06
中国合格评定国家认可委员会授权人


China National Accreditation Service for Conformity Assessment
INSPECTION BODY ACCREDITATION CERTIFICATE
(Registration No. CNAS IB1145)
Shanghai Wesafe Racking Safety Inspection Technology Co., Ltd.
(Legal Entity: Shanghai Wesafe Racking Safety Inspection Technology Co., Ltd.)
Room 306, No.2, Building 1, No.1588, Huhang Highway, Fengxian District, Shanghai, China
is accredited in accordance with ISO/IEC 17020: 2012 General Criteria for the Operation of Various Types of Bodies Performing Inspection(CNAS-CI01 Accreditation Criteria for the competence of Inspection Bodies) as Type A inspection body for the competence to undertake inspection services as described in the schedule attached to this certificate.
The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule forms an integral part of this certificate.
Effective Date: 2023-10-07
Expiry Date: 2029-10-06


中国合格评定国家认可委员会
实验室认可证书
（注册号：CNAS L19154）
兹证明：
上海穗图货架安全检测技术有限公司
上海市奉贤区沪杭公路 1588 号 1 幢 2 号楼 3 楼 306 室，
201401
符合 ISO/IEC 17025：2017《检测和校准实验室能力的通用要求》（CNAS-CL01《检测和校准实验室能力认可准则》）的要求，具备承担本证书附件所列服务能力，予以认可。
获认可的能力范围见标有相同认可注册号的证书附件，证书附件是本证书组成部分。
生效日期：2023-10-07
截止日期：2029-10-06
中国合格评定国家认可委员会授权人


China National Accreditation Service for Conformity Assessment
LABORATORY ACCREDITATION CERTIFICATE
(Registration No. CNAS L19154)
Shanghai Wesafe Racking Safety Inspection Technology Co., Ltd.
(Legal Entity: Shanghai Wesafe Racking Safety Inspection Technology Co., Ltd.)
Room 306, 3/F., Building 1-2, No.1588, Huhang Highway, Fengxian District, Shanghai, China
is accredited in accordance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake the service described in the schedule attached to this certificate.
The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule forms an integral part of this certificate.
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About CMA

Issued by provincial quality supervision bureaus, CMA certification is a prerequisite for third-party testing companies in China to issue legal inspection reports.

190908341751

About SEMA

SEMA expert certification is issued by the UK Storage Equipment Manufacturers Association and is the top choice for rack safety managers (EHS) among clients in Europe, North America, and Australia.

About CQC & CAWD

2024: Became Shanghai Office of the Technical Application and Engineering Services Subcommittee under the China Association of Warehousing and Distribution

2023: Designated as an entrusted testing laboratory by the China Quality Certification Center (CQC).

Honors and Certificates

Recognized as a National High-Tech Enterprise, National Technology-Based SME, Innovative SME, and awarded the Provincial Specialized and Innovative SME Certificate.

Patents and Software Copyrights

We have secured over 50 intellectual property rights, including invention patents, utility model patents, and software copyrights.

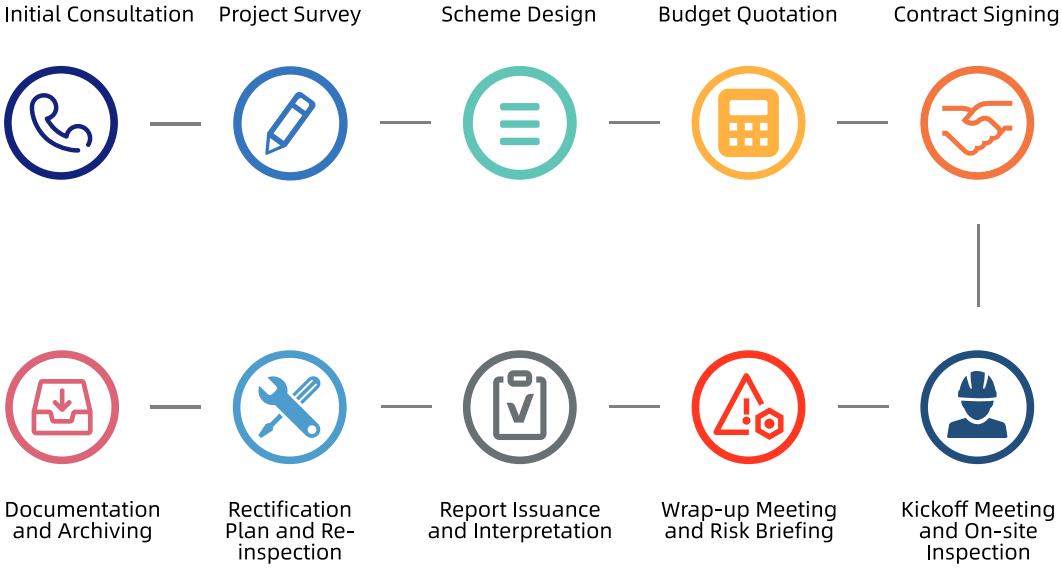
Expert Certifications

National Standardization Technical Committee

Asia-Pacific Registered Structural Engineer Certificate

Expert Certificate from the China Association of Warehousing and Distribution

Business Process & Liability Insurance



Each step in safety inspection and solution delivery must be rigorous, ensuring even the smallest bolt is clearly marked and every issue is met with effective analysis to prevent potential risks.

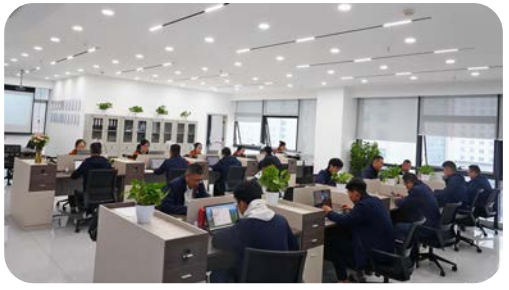
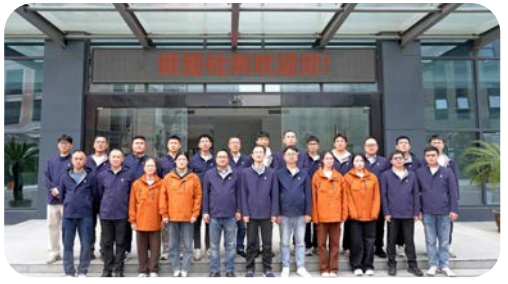

华泰保险
华泰财产保险有限公司
Huatai Property & Casualty Insurance Co.,Ltd.
承保表

All Wesafe deliverables are covered by Professional Liability Insurance.

Inspection Equipment & Expert Teams






Rack Engineering Inspection

Conducted in accordance with GB/T 39681, GB/T 41514, JB/T 11270, and T/CSCS 032, covering inspection frequency, scope, quantity ratio, and judgment criteria. Establishing a three-tiered inspection system and conducting annual professional inspections significantly reduce safety risks and prevent major losses.

Safety Status Inspection

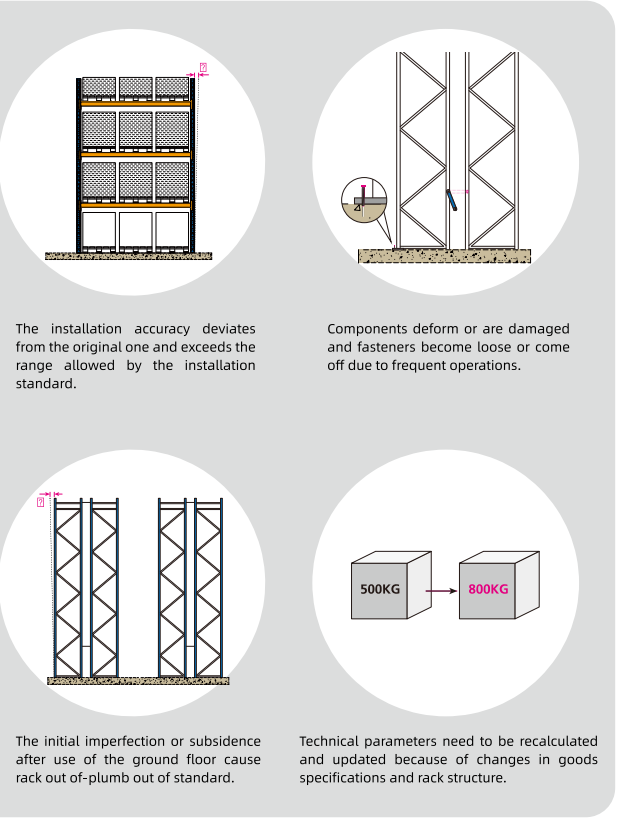
Clients may commission certified inspection organizations to assess rack components for damage, structural deviation, and load reliability, collecting data on anomalies, changes, and certifications of bearing capacity.

Completion Acceptance Inspection

Joint inspections by clients, suppliers, and qualified third parties to verify if manufacturing, installation, and design compliance meet the technical agreement, including measurements, accuracy, and structural documentation.

Component Sample Testing

Testing to confirm performance parameters such as surface treatment, axial compression, bending strength, stiffness, and beam-column joint rigidity of rack components. The testing data is documented in reports.



The installation accuracy deviates from the original one and exceeds the range allowed by the installation standard.

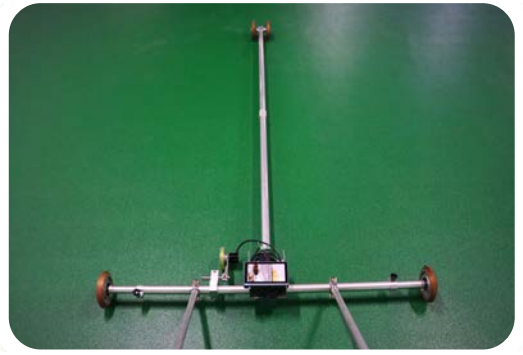
Components deform or are damaged and fasteners become loose or come off due to frequent operations.

The initial imperfection or subsidence after use of the ground floor cause rack out of-plumb out of standard.

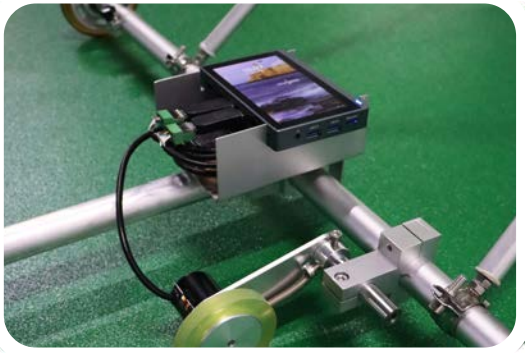
Technical parameters need to be recalculated and updated because of changes in goods specifications and rack structure.

Floor Flatness Inspection of VNA Racks

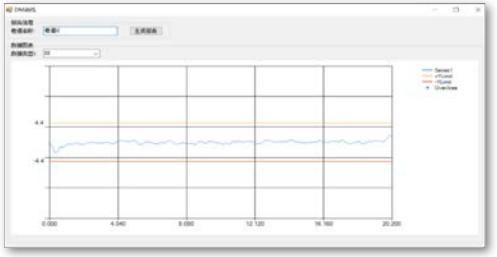
For aisles with narrow-aisle racking where specialized forklifts operate in fixed directions, and warehouse floors where standard forklifts maneuver freely before racking installation, horizontal and linear flatness are assessed based on relevant floor flatness standards.



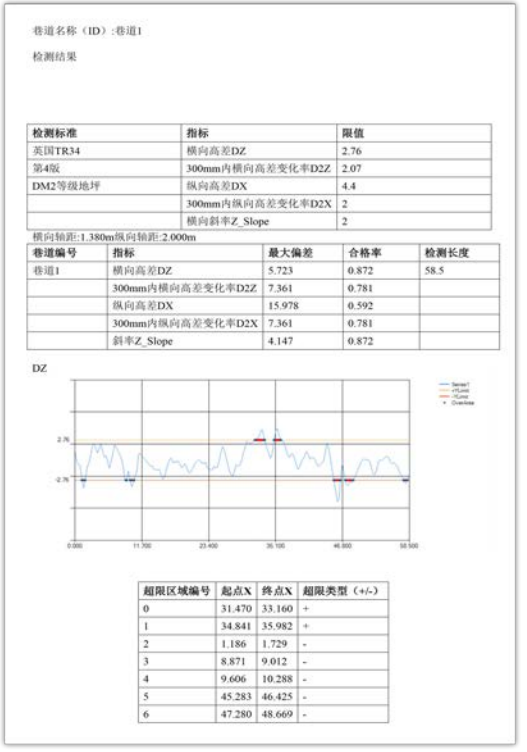
Free-Expandable inspection Frame work
Simulating Forklift Movement Trajectories
(Applicable for Narrow-Aisle VNA Floors)



Precision Sensors
(Military-grade precision: 0.001°,
millisecond-level data acquisition)



System Data Imported to
Generate DM Curves



巷道名称（ID）:巷道1

检测结果

检测标准	指标	限值
英国TR34	横向高差DZ	2.76
第4版	300mm内横向高差变化率D2Z	2.07
DM2等级地坪	纵向高差DX	4.4
	300mm内纵向高差变化率D2X	2
	横向斜率Z_Slope	2

横向轴距:1.380m纵向轴距:2.000m

巷道编号	指标	最大偏差	合格率	检测长度
巷道1	横向高差DZ	5.723	0.872	58.5
	300mm内横向高差变化率D2Z	7.361	0.781	
	纵向高差DX	15.978	0.592	
	300mm内纵向高差变化率D2X	7.361	0.781	
	斜率Z_Slope	4.147	0.872	

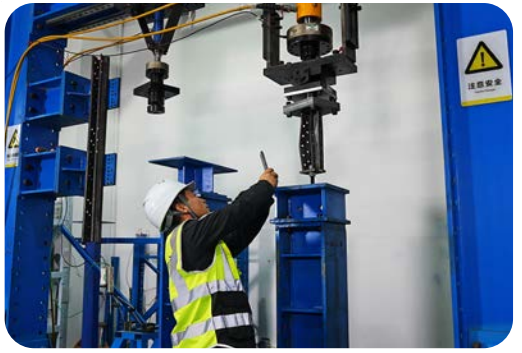
DZ

超限区域编号	起点X	终点X	超限类型（+/-）
0	31.470	33.160	+
1	34.841	35.982	+
2	1.186	1.729	-
3	8.871	9.012	-
4	9.606	10.288	-
5	45.283	46.425	-
6	47.280	48.669	-

The generated inspection report
accurately identifies over-limit
locations.

Other Testing Services

Beam End Tab Testing



Upright Axial Compression Testing

Upright Bending Testing

Load Beam Testing

Bolt Pull-out Strength Testing

Light/Medium-Duty Rack Load Testing

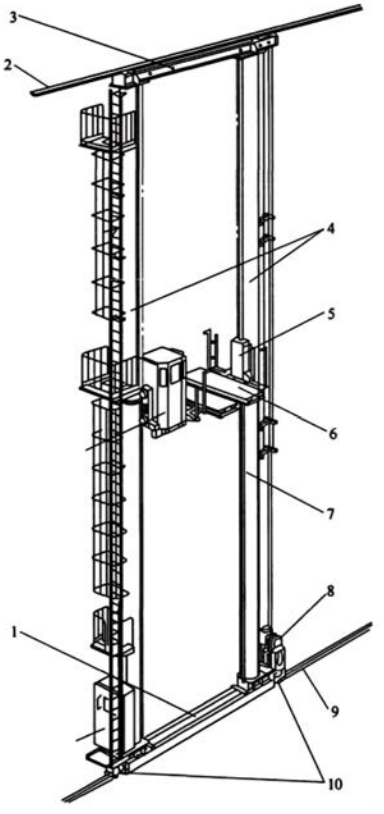
Cross Beam Load Testing

Pallet Load Testing

Intelligent Equipment Testing

The testing and inspection of Intelligent warehousing equipment such as stacker cranes, conveyor lines, and four-way shuttles —is essential to evaluating their design, installation, and operational reliability. Key evaluation parameters include manufacturing quality, installation precision, operational functionality, and safety.

Smart AS/RS Stacker Crane Testing



1、Lower Beam

2、Running Guide Rail

3、Upper Beam

4、Upright

5、Cargo Platform

6、Loading and Unloading Device

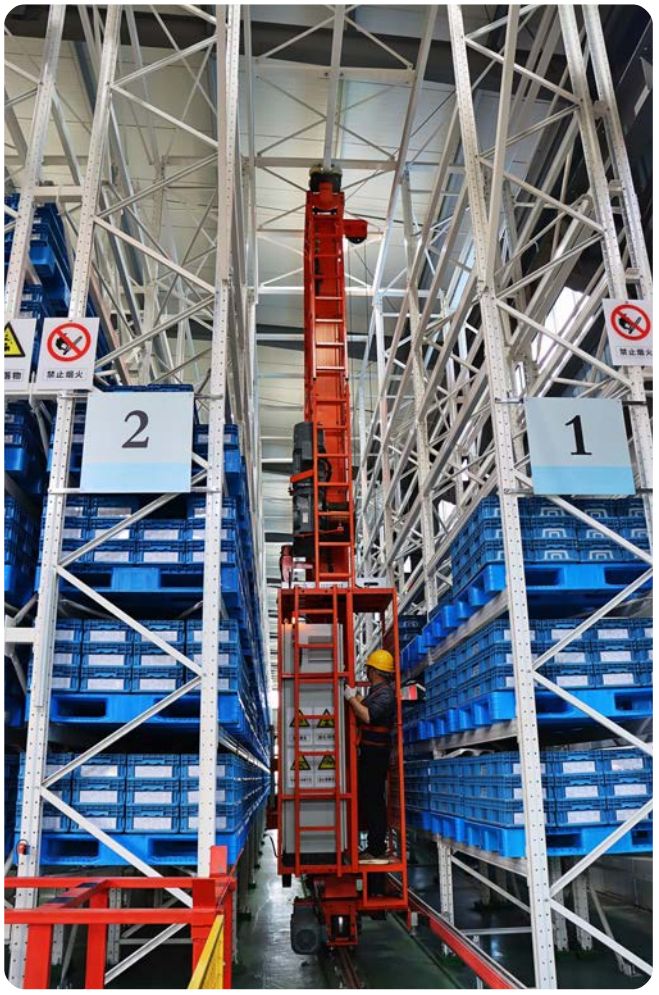
7、Lifting Guide Rail

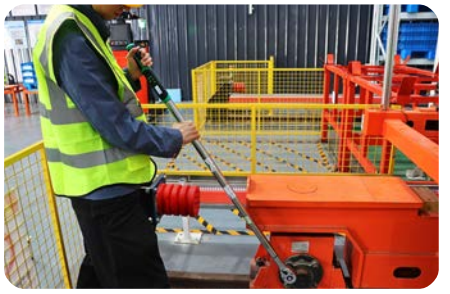
8、Lifting Mechanism

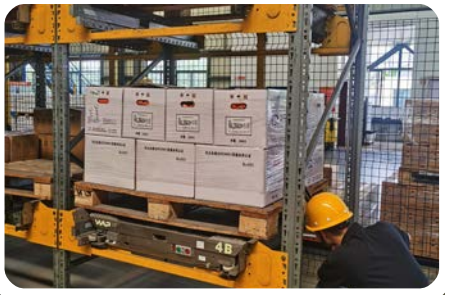
9、Running Track

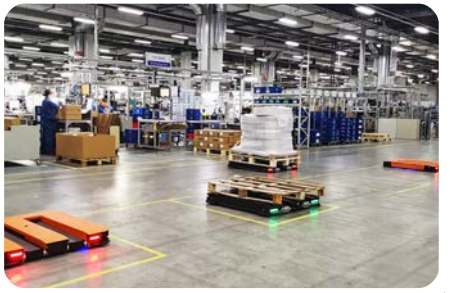
10、Running Mechanism

Intelligent Equipment Testing









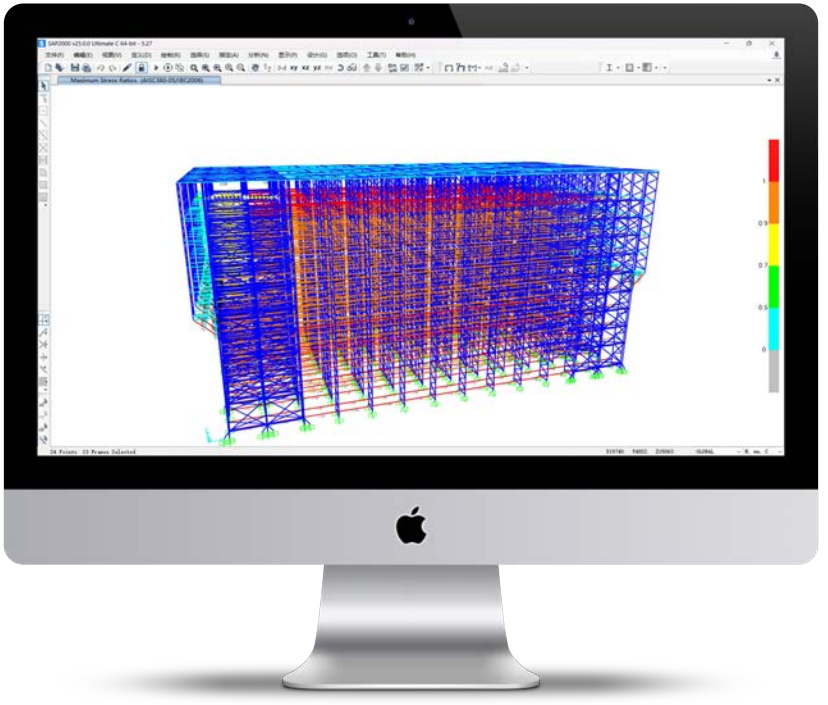
Comprehensive testing and inspection for stacker cranes, conveyor lines, four-way shuttles, and AGVs in intelligent warehousing systems.

Issuance of Structural Calculation Reports

With extensive experience in rack structural design and testing equipment for component performance parameters, we provide reliable structural selection support for entire racking projects.

Rack Structural Design Process

- Define design standards, seismic codes, and load requirements
- Specify structural layout, drawings, and component dimensions
- Perform internal force analysis using SAP2000
- Verify components per racking standards
- Provide conclusive calculation report
- Certified and interpreted by a licensed structural engineer



Standard Structural Calculation Report Template

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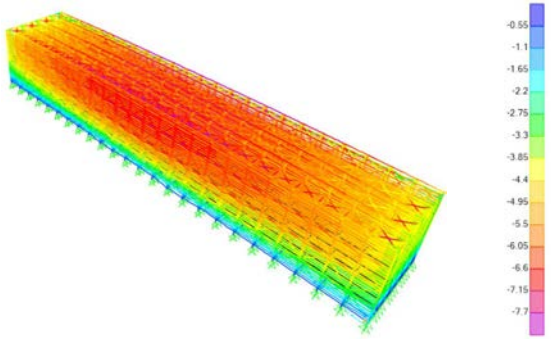
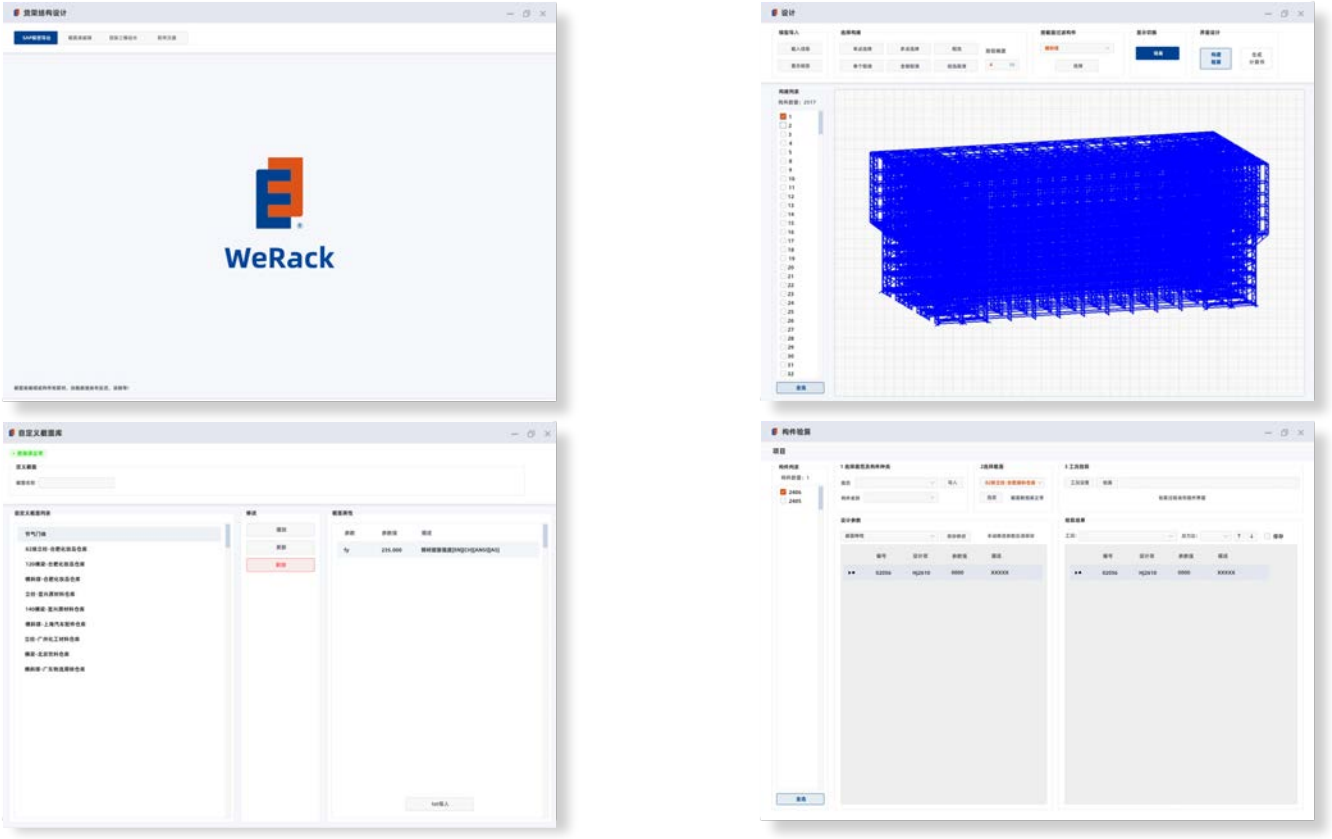


The report necessitates submission by individuals who have already obtained the national registration as a Structural Engineer certification.

Structural Design Assistance Software

WeRack is a proprietary rack structural design software developed by Wesafe. It supports GB/EN/ANSI/AS international codes and enables closed-loop intelligent verification from finite element modeling to report generation. The software automatically generates structural reports with less than 0.5% error and improves efficiency by 80% compared to manual verification. Successfully deployed in multinational warehousing projects, it helps engineers deliver compliant designs across countries.



WeRack – The World's First Dedicated Rack Structural Design Verification Software

Intelligent Warehousing Project Management

For automated AS/RS system projects, we provide end-to-end technical services, including project initiation, solution design, implementation supervision, and final acceptance. Our services help clients clearly define project requirements, select optimal solutions, and ensure compliant and efficient project delivery. Full acceptance reports and certifications can be issued.

Project Initiation

Define project background and objectives; analyze business types and scenarios; assess feasibility of logistics automation and recommend equipment selection; provide investment budget suggestions.

Solution Design Review

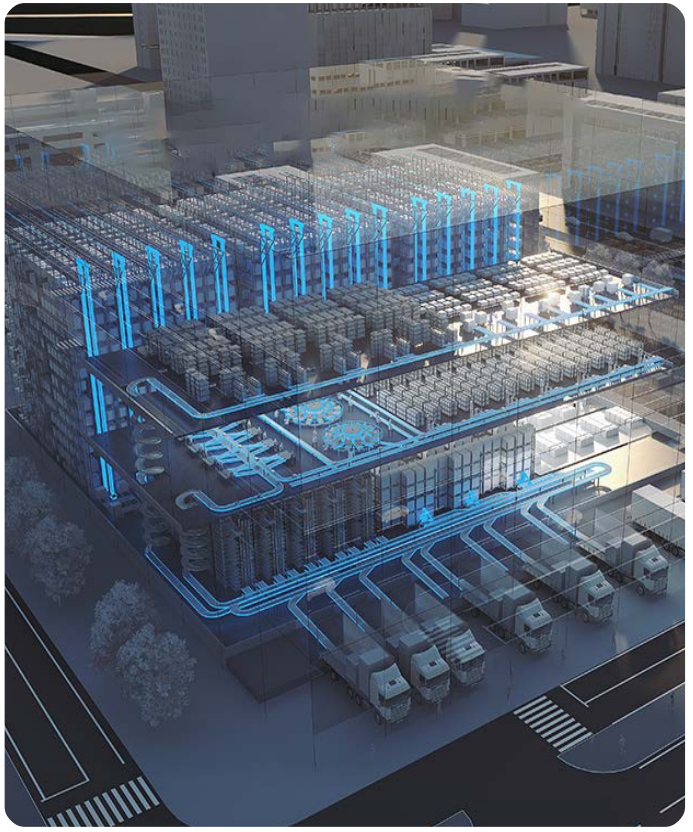
Review business operation models, facility layout plans, warehousing equipment configurations; assess software system requirements and conduct cost-benefit analysis.

Project Implementation Management

Oversee overall project implementation plan; monitor layout planning, hardware design, installation, and key quality checkpoints; design software system requirements, supervise development, conduct remote testing and deployment; facilitate joint debugging and integration testing

Acceptance and Evaluation

Assess basic performance of automation equipment, operational efficiency, capacity metrics, safety and stability; evaluate software system and O&M platform functionalities



Evaluation & Certification

The China Rack Technology Federation (CRF) is a leading authority in China's racking industry, composed of major domestic rack manufacturers. Through dedicated working groups, it establishes full-chain industry guidelines covering design, installation, and inspection. It promotes both ISO9000 and CRF-exclusive quality systems, and provides member enterprises with qualification audits, technical training, and product traceability services. Its certification mark indicates compliance with international safety standards in design, manufacturing, and installation, and is widely recognized both domestically and internationally.

The China Association of Warehousing and Distribution is a national non-profit industry association. It has established subcommittees in areas such as cold chain, hazardous materials, financial warehousing, self-storage, smart logistics, collaborative distribution, dealer warehousing, cloud warehousing, traditional Chinese medicine storage, spare parts logistics, and technical application and engineering services. The association also serves as the secretariat of the International Federation of Warehousing and Logistics Associations (IFWL), and is dedicated to advancing modernization in China's warehousing and logistics sector.

The China Quality Certification Center (CQC) is a nationally authorized quality service organization (Certification License No. 001), officially recognized by the Chinese government and accredited by numerous international authorities. It is a member of leading international certification bodies and represents China as the National Certification Body (NCB) in the IECEE system. CQC's expert team includes many individuals who serve in the leadership of international certification organizations or hold internationally recognized credentials. It has issued several landmark certifications and led or participated in over 100 national and provincial-level projects, contributing to the development and release of nearly 340 national standards.

Evaluation & Certification (Rack Safety Management Personnel)

Raining Content: Fundamentals of racking systems, classification and features, project lifecycle, design standards, safety overview, legal and regulatory requirements, safety inspection, and maintenance measures.

Target Participants: Management, supervisors, operators, department heads, safety representatives of end-users, rack suppliers, and related safety experts.

Training Duration:3 days, including theoretical training and hands-on practice, delivered in person.

Assessment&Certification: Certification is issued upon successful completion of the training and passing the final assessment. Digital certificates can be verified on the CRF platform.

Rack Safety Management Personnel Evaluation Certificate

Evaluation & Certification (Rack Installation Personnel Competency)

Training Content: Installation standards, installation procedures, operational skills, safety precautions, and quality control

Target Participants: Individuals aged 18 and above intending to work in rack installation

Training Duration: Within 30 days, combining online and offline learning formats

Assessment & Certification: Certification is issued after theoretical and on-site practical evaluations. Digital certificates are available for verification via the CRF platform.

Rack Installation Personnel
Competency Evaluation Certificate

Evaluation & Certification (Rack Structural Engineer Competency)

Training Content:
Phase 1: Theory (16 hours)
Phase 2: Fundamentals and Practice – Finite Element Modeling (16 hours)
Phase 3: Fundamentals and Practice – Component Design Verification (16 hours)
Phase 4: Fundamentals and Practice – Structural Calculation Report Preparation (8 hours)
Phase 5: Advanced Practice – Beam-type, bracket-type, and shuttle-type AS/RS racking systems (24 hours)

Target Participants:
1.Entry-level learners: Graduates from science and engineering backgrounds involved in racking technology
2.Transitioning engineers: Structural designers and warehouse planners from other fields
3.Technical managers: Rack company technical directors, project managers
4.Inspectors and assessors: Engineers and safety assessors from third-party testing organizations

Assessment & Certification:
Dual-track evaluation system: 1) Competency assessment; 2) Project-based evaluation. Digital certificates are available for verification via the CRF platform.

Rack Structural Engineer Competency Evaluation Certificate

Evaluation & Certification (Enterprise Capability & Product System)

Rack Design System Evaluation

Through inspection and review, assess whether a company's design team and management system consistently meet specific standards and can stably deliver compliant racking structures. Written verification is issued.

Rack Installation System Evaluation

Through inspection and review, assess whether an installation company's personnel and processes consistently meet requirements for standard-compliant racking installation. Written verification is issued.

Rack Product Quality Evaluation

Through inspection and testing, verify that components or rack structures comply with relevant standards or technical specifications. Written certification is provided.

Evaluation & Certification (Intelligent Warehousing Project Certification)

The China Quality Certification Center (CQC) as the certification body, the China National Institute of Metrology as the implementation body, and Wesafe as the implementation and liaison body have jointly launched the Intelligent Warehousing Project Certification program—also known as the CQC Intelligent Warehousing Certification. For AS/RS and shuttle racking systems, comprehensive quantitative and qualitative testing is performed post-completion across three dimensions: information systems, automated equipment, and storage racks. Upon successful evaluation, a CQC certification is issued.

- Certification is based on inspection, testing, and evaluation
- Certification reflects tec-hnical excellence and leadership
- Certification empowers high-quality development in intelligent warehousing

CQC Intelligent Warehousing Project Certification

Certification for Export-Oriented Rack Projects

Green Warehouse Evaluation

Definition & Objectives

A green warehouse achieves efficient and environmentally responsible warehousing through energy, land, water, and material savings across its full lifecycle.

Core Goals:Reduce operational energy consumption by over 30%; improve resource utilization; minimize carbon emissions

Evaluation Standards & Process

Based on GB/T 28581-2012 “General Warehouse and Storage Area Planning Parameters” , SB/T 11164-2016 “Green Warehouse Requirements and Evaluation” , and the “China Green Warehouse Certification Guidelines” .

Process: Self-assessment → Application → On-site Audit → Public Notice → Award (1–3 star levels, 3 stars max)

Key Indicators

Energy: Energy use per square meter must be lower than industry average

Land: Optimize space usage (e.g., high-bay racks, underground space)

Environment: Greening rate ≥ 20%, better temperature, ventilation than standard warehouses

中国绿色仓库
China Green Warehouses

CAWD

Green Warehouse Evaluation

Energy and Resource Savings

Compared with conventional warehouses, energy use per square meter is reduced by over 30%; integrated water and electricity savings reduce utility costs by 20%–40%; optimized space design and energy-saving equipment (e.g., solar panels, natural lighting) lower long-term maintenance costs.

Policy Incentives & Financial Support

Governments in cities like Jinan, Zhengzhou, and Changsha offer one-time rewards ranging from RMB 100,000 to 600,000 for certified enterprises; certified companies may access low-interest loans or green funding, with total financing cost savings exceeding RMB 40 million (e.g., GLP, Vanke Logistics)

ESG & Brand Value

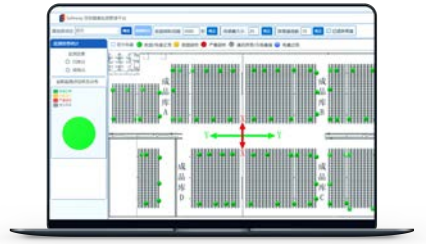
Green warehouses enhance ESG reporting (e.g., SF Express, COFCO) and demonstrate environmental responsibility; recognized under the GRESB framework, supporting overseas investment and global partnerships (e.g., GLP attracting international capital via certification).

Certificate

Plaque

Rack Health Monitoring System

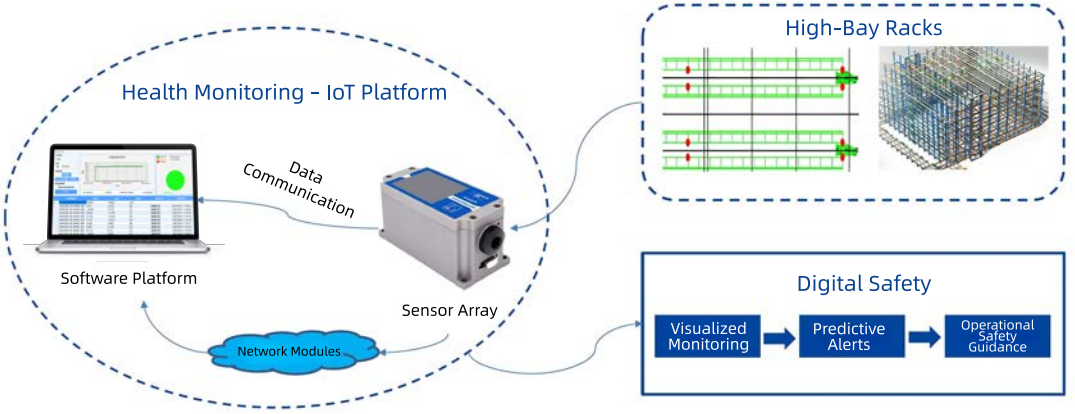
Foundation for Predictive Decision-Making and Preventive Maintenance



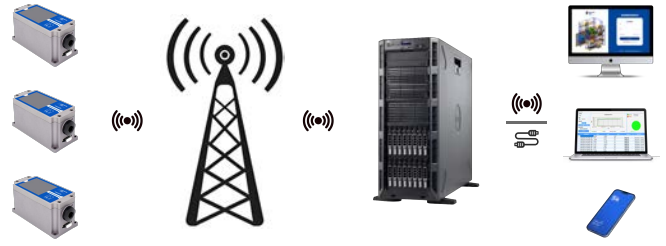
With the rise of intelligent high-bay racking systems in AS/RS automated warehouses and shuttle-based dense storage scenarios, risks of rack deformation are increasing—due to design flaws, installation errors, or floor settlement. Excessive rack tilt can lead to equipment failures for stacker cranes and shuttles, directly impacting operational efficiency and personnel safety. The Rack Health Monitoring System performs real-time tracking of verticality (tilt) in high-bay uprights, identifies trends in structural changes, issues alerts for threshold exceedances, and provides data support for manual interventions.

System Architecture of the Rack Health Monitoring System

The Rack Health Monitoring System is based on IoT technology, integrating software, sensors, and network equipment. Hardware collects data and transmits it to a central processing platform, where back-end systems analyze and visualize structural health in real time. Exceedances are flagged automatically, and regular reports and recommendations are generated.



Public Network Deployment – NB-IoT



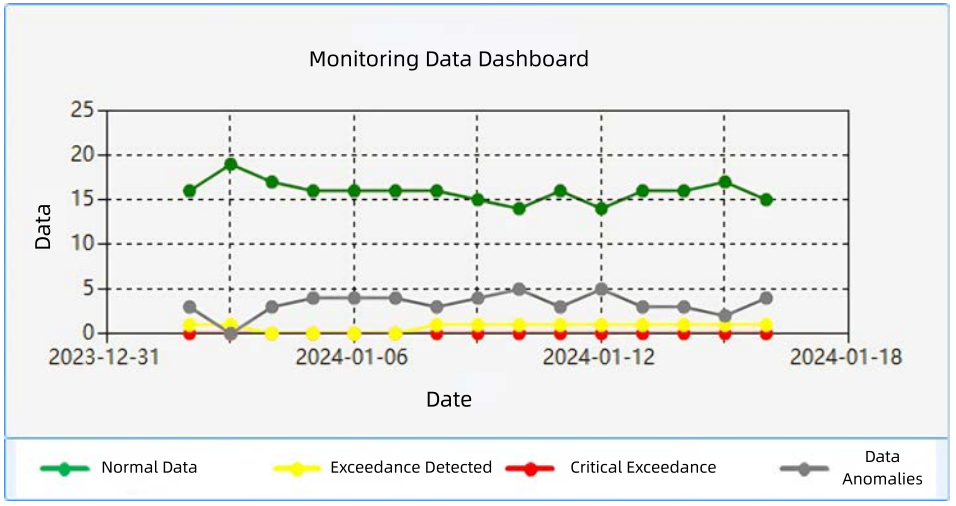
NB Sensors | Carrier Base Station (e.g., China Mobile) | Server | User Terminal

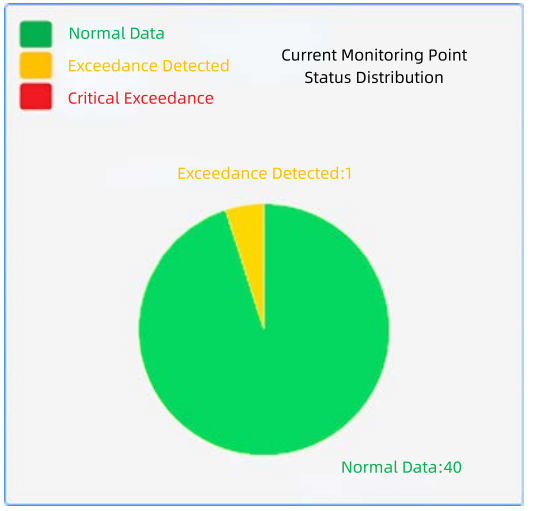
Private Network Deployment – LoRaWAN

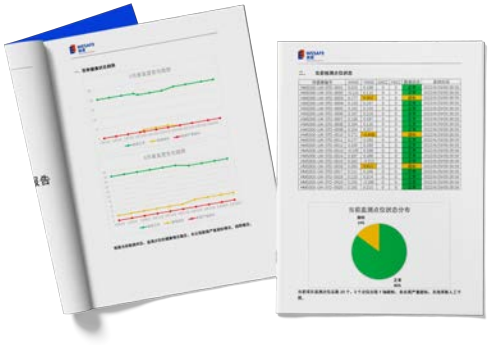
LoRa Sensors | LoRaWAN Gateway | Local Server | User Terminal

System Functions of the Rack Health Monitoring System

Based on standards and warehousing equipment parameters (e.g., stacker cranes), the system dynamically sets threshold values for upright tilt and categorizes exceedances into "Warning" and "Critical." When abnormal data is detected, the system sends alerts via SMS, pop-ups, and other channels, while logging key parameters like timestamp and displacement. Historical data can be traced to analyze correlations between rack deformation and equipment failures (e.g., stacker crane jamming), supporting fault attribution.







Global Health Map: A heat map shows the overall health of the racking system, allowing quick identification of high-risk areas (e.g., zones with concentrated tilt). Single-Point History Curves: Track changes in individual monitoring points to predict structural fatigue. Rack safety managers can generate monthly monitoring reports via the backend system, which also serve as maintenance references.

Scope of Services – Rack Health Monitoring System

001
Project Survey
Analysis of user racking configuration
Collection of rack layout drawings
Preliminary zoning analysis for monitoring

002
Proposal & Quotation
Monitoring point scheme design
Confirmation of technical requirements
System quotation and contracting

003
Hardware Installation
Initial measurement of upright verticality and floor settlement Data verification,sensor installation
Sensor commissioning and fine-tuning

004
Software Deployment
Backend database integration
On-site user interface deployment
System operation training and documentation handover

005
System Maintenance
Monthly: Data analysis reports
Quarterly/Annually: Structural health reports and recommendations

Hardware Warranty & Maintenance	3-year warranty for sensors, batteries, and communication modules, 6 years of free system maintenance (software updates and network tuning)
Data Services	Automatically generate "Monthly Rack Health Analysis Reports", 24/7 multi-level alert system (SMS/email/pop-up)
Flexible Adjustment Services	Free adjustment of sensor placement schemes, compatible with third-party systems (WMS/ERP)
Case Example	In an AS/RS warehouse, data at a monitoring point exceeded limits. After system alert, the after-sales team analyzed remotely and proposed a temporary solution: "pause operations + adjust local rack positions." On-site reinforcement was completed within 3 days, preventing rack collapse.






Patent Application: Rapid Upright Repair Solution

When racking systems are damaged, timely repair is key to minimizing operational disruption. We offer a comprehensive and efficient solution combining proprietary jacking and rapid-cutting tools, minimizing the need to unload goods and ensuring fast maintenance with minimal interference.

- **Wide Applicability**
- **Minimal Operational Impact**
- **Fast Turnaround**

Installation Quality Acceptance Report Provided

All rapid repair solutions are tested and certified by professional engineers to ensure safety and durability. Upon completion, an Installation Quality Acceptance Report is issued. WE FLEX components have a service life of several decades.

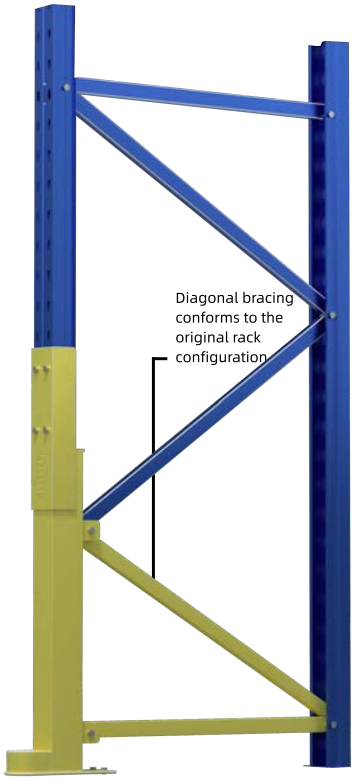
Patented Rack Repair Equipment

Rack Jacking Device (Patent No. ZL 2023 2 0347719.7), Rapid Cutting Device (Patent No. ZL 2023 2 0905411.X)

Case Study – International Perfume Brand

Enabled zero-downtime rack repairs for a global perfume leader. Spark-free operation and no need to unload 70% of the goods ensured continuous warehousing and high-end perfume safety. This showcases the value of modular repair solutions in luxury supply chains.

Rapid Upright Replacement Components



A fast, non-intrusive rack repair solution. All components are designed and manufactured in strict accordance with national or industry standards, certified by independent third parties, and compatible with the vast majority of upright specifications. Racks bear clear certification marks and load-bearing data labels, ensuring that the original load-bearing capacity is maintained after component replacement.

WE FLEX Upright Replacement Assembly

A new-generation upright maintenance solution designed to protect your rack system from forklift collisions.

High Strength & Customizable

A customizable, reusable, and durable repair solution. Precisely engineered and rigorously tested to safeguard warehouse rack systems and extend service life. WE FLEX is adjustable to fit various rack sizes and types and incorporates patented designs capable of withstanding severe impacts.

Flexible Installation

Modular repair solutions offer flexible, cost-effective installation. No need to dismantle the rack system—simply unload goods adjacent to the damaged upright to create sufficient repair space. No welding is involved, and upright cutting produces no sparks. Repairs can be completed in as little as one hour.

Third-Party Certification

All standard upright replacement assemblies are mechanically tested and load-rated by independent institutions (Shanghai Wesafe Racking Safety Inspection Technology Co., Ltd.) to meet applicable performance control standards.

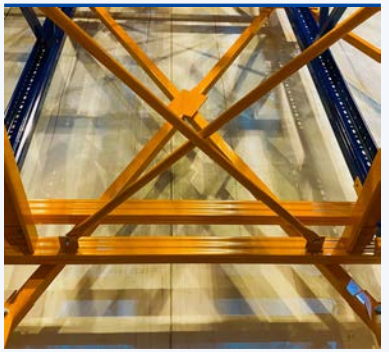
Patent Application: Structural Reinforcement Components

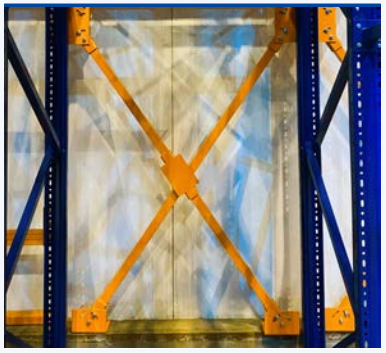
We conduct comprehensive assessments of existing racking systems, evaluating the strength, stability, and corrosion status of critical components such as uprights, beams, and connectors. Weak points (e.g., weld seams, loose bolts) are identified to provide the technical foundation for reinforcement solutions. Based on the results, we develop targeted reinforcement schemes—such as back and top diagonal bracing—to strengthen critical sections and connections, thereby mitigating the risk of rack tilting or collapse and ensuring personnel and cargo safety.

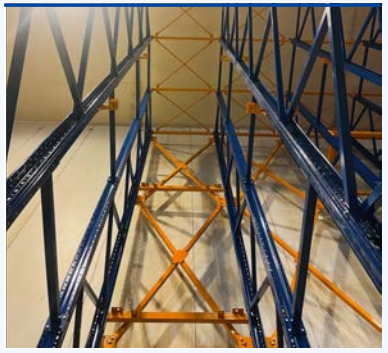
- **Scientific & Professional**
- **Significant Safety Improvement**
- **Customizable & Flexible**

Installation Quality Acceptance Report Provided

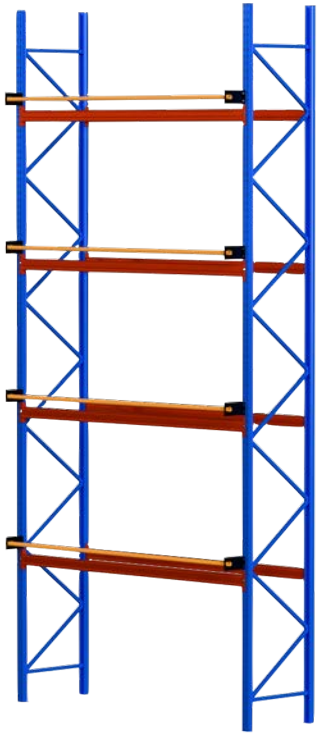
All reinforcement solutions are tested and certified by professional engineers for safety and durability. Upon completion, an Installation Quality Acceptance Report is issued.







Patent Application: Elastic Back Stop Bars



[Safety Notice] Two types of back stop bars are often confused in current rack designs: cushioning-type bars, which help guide forklifts during loading, and standard-type bars, which serve solely as physical stops. Mistakenly using standard bars as cushioning elements may cause forklift impact forces to transfer directly into the rack's main structure. While the bar itself can be replaced, the main structure could sustain irreversible damage. To address this, we developed the Elastic Back Stop Bar.

Elastic Back Stop Bar

WESAFE Third-Party Certified

Available in custom lengths to fit various beam-style racks; supports quick installation and collaborative multi-point protection.

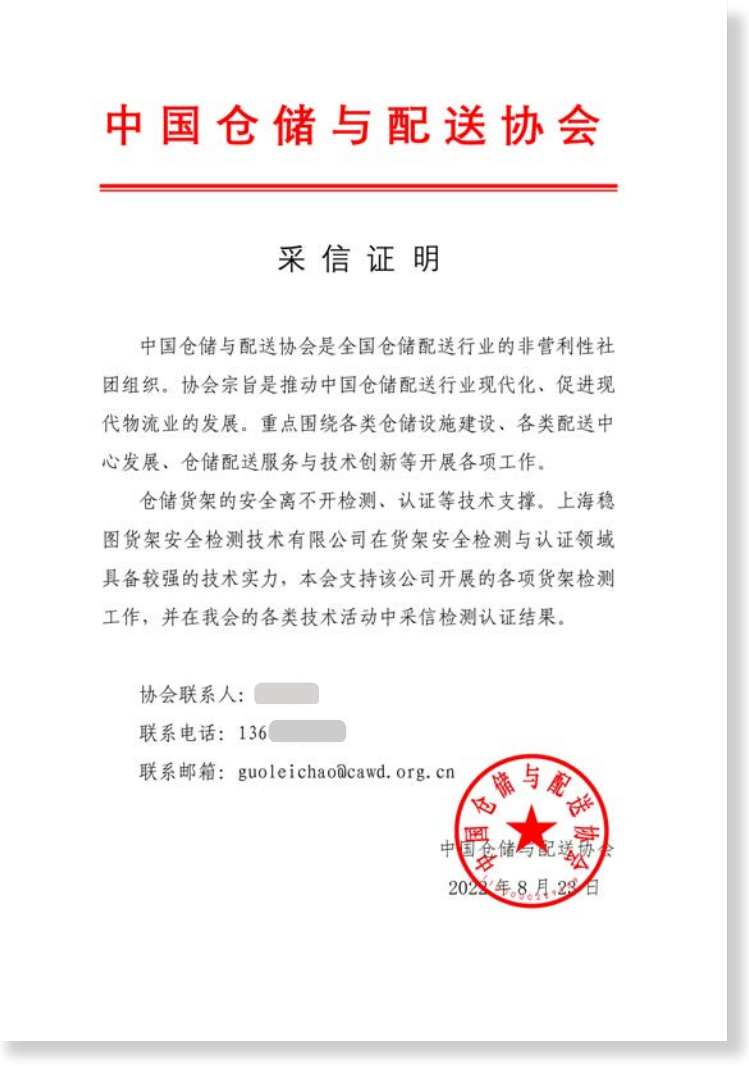
Efficient Energy Absorption

Through elastic deformation, the bar converts impact energy into strain energy, reducing shock force by 60%–80%, thereby protecting structural integrity.

Self-Resetting System

Automatically returns to its original form within 0.5 seconds after unloading—no manual intervention required. Comp-ared to traditional rigid bars, it reduces maintenance frequency by 70% and lowers lifecycle O&M costs by 40%.

Traditional Rigid Bar	Elastic Back Stop Bar (Patented)
Permanently deformed after impact; must be replaced	Permanently deformed after impact; must be replaced
Impact force transmitted directly to the rack	Impact force transmitted directly to the rack
High maintenance cost and significant safety risk	High maintenance cost and significant safety risk



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协会联系人：

联系电话：136

联系邮箱：guoleichao@cawd.org.cn

中国仓储与配送协会

2022年8月29日

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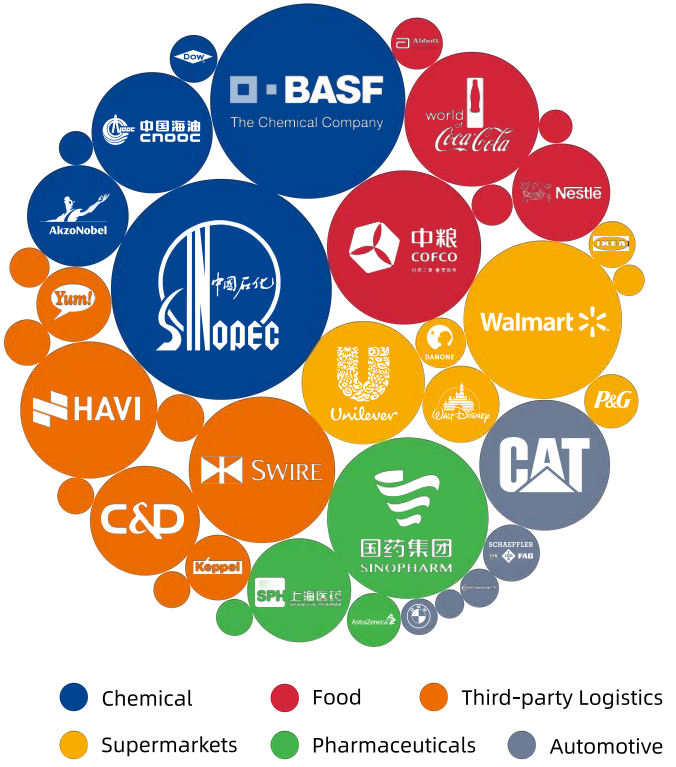

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Wesafe Recommended Standards List:

Design Category

· CECS23:90 The specification for design of steel storage racks
· GB/T 39681-2020 Racking design code for steel static storage systems
· GB/T 39830-2021 Code for seismic design of steel static storage systems

Installation Category

· GB/T 39060-2020 Technical requirements of manufacturing and installation consulting service for automated storage and retrieval system
· JB/T 11270-2024 Assembled steel rack structure for high-bay warehouse — Technical requirements
· WB/T 1066-2017 Technological conditions of rack installation and acceptance

Product Category

· WB/T 1044-2012 Pallet rack
· WB/T 1076-2018 Cold storage racking
· JB/T 14173-2021 Pallet units storage shuttle racking

Testing Category

· GB/T 41514-2022 Standard for safety and evaluation of steel structure racks
· T/CSCS 032-2022 Standard for the inspection and assessment of steel storage rack structures
· T/WD 115-2022 Specification for inspection of steel storage rack in service

WESAFE
稳图
Excellent Engineer

Headquarters: Room 306, Building 2, Fengchuang Valley Science & Technology Park, No. 1588 Huhang Highway, Fengxian District, Shanghai

Safety Center: Room 109, 1st Floor, Building 1, No. 8 Xiaoye Road, Fengxian District, Shanghai

Branch Office: Room 802, Jinfeng Building, No. 5 Siyun Road, Economic Development Zone, Xuzhou

Tel: 021-6715 7048

Email: service@wesafesh.com

www.wesafesh.com

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