

仓库安全总览

Warehouse General safety

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- 超过20年的跨国药企工作经验，涵盖了从工厂选址、新厂证照、报告的申请批准到厂房建设及交付、工厂转移和关闭的厂房全生命周期。担任过的职位，包括：机械工程师、生产主管、设计协调、项目监管经理、工厂风险管理负责人、工厂转移经理、生产运营经理和价值流主管、EHS经理和中国区EHS负责人等多种角色。相关证书：注册安全工程师、注册设备安全工程师、机电学士、质量管理硕士、六西格玛黑带



仓库安全事件分享



内容提要

仓库类型 Warehouse type

法规要求 Regulatory requirement

关键要素 Key element

常见风险 Common risk

安全建议 Safety Tips

案例分享 Case Study Examples

仓库类型 Warehouse type

- 普通仓库
General warehouse
- 危险化学品仓库（固体、液体 & 气体）
Hazard chemical warehouse (Solid, Liquid & Gas)
- 物流中心
Distribution centre
- 实验室试剂仓库
Lab solvent warehouse
- 高架仓库（自动/手动）
High rack warehouse (auto/manual)
- ...



多重风险的工作环境 A complex workplace with various risks

法规要求 Regulatory requirement...

- GB 50016 建筑设计防火规范
- GB 15603 危险化学品仓库储存通则
- AQ 3047 化学品作业场所安全警示标志规范
- 仓库防火安全管理规则
- ...

- OSHA 29 CFR 1910.176 Handling materials
- OSHA 29 CFR 1910.178 Power Industrial Trucks
- ...

- HSG 76 Warehousing and storage: A guide to health and safety
- HSG 71 Chemical warehousing: The storage of packaged dangerous substances ...

法规聚焦 Regulatory focus

2023 OSHA审查重点评估风险 OSHA inspections target hazards

- 动力工业车辆操作 Powered industrial vehicle operations
- 物料处置及储存 Material handling and storage
- 行走与工作台面 Walking and working surfaces
- 撤离通道 Means of egress
- 消防安全 Fire protection

100
20,000

Figure 1 Causes of major injuries in storage and warehousing (2005/06)

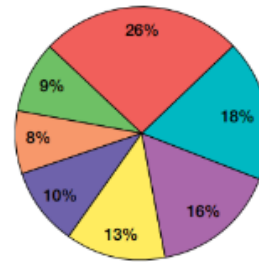
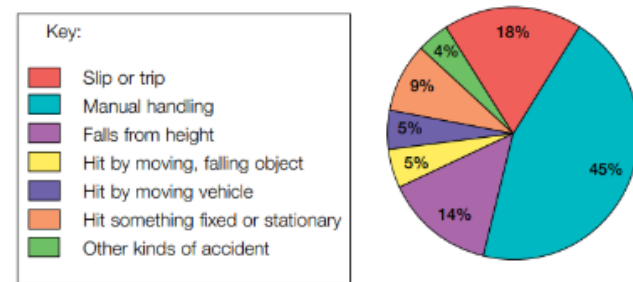


Figure 2 Causes of over-3-day absence injuries in storage and warehousing (2005/06)



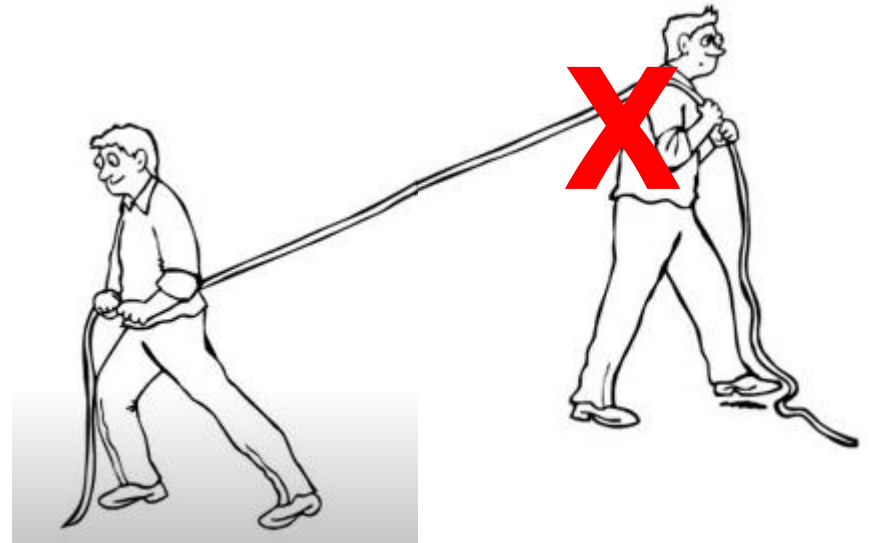
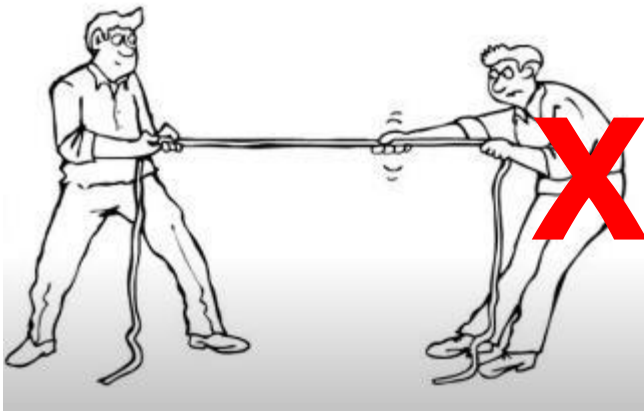
仓库储存 Warehousing and storage

安全与健康指南 (英国) A guide to health and safety UK

仓库安全关键要素 Warehouse Safety key element

- | | |
|--------------------|--|
| 1. 仓储货架 | Storage Racking |
| 2. 动力工业车辆 (叉车和托盘车) | Powered Industrial Trucks (Forklifts and Pallet Jacks) |
| 3. 运输 & 行人 | Transport & Pedestrians |
| 4. 物料处置 | Materials Handling |
| 5. 装卸货平台 | Loading Bay/Docks |
| 6. 高处坠落 | Falls From Height |
| 7. 危害沟通 | Hazard Communication |
| 8. 电气系统 | Electrical Systems |
| 9. 危险物质 | Hazardous Substances |
| 10. 机械安全 | Machinery Safety |
| 11. 消防系统 | Fire Systems |
| 12. 撤离通道 | Means of egress |
| 13. 工作场所安全 | Workplace Safety |

仓库内常见风险 Common Risks in warehouse



安全建议 Safety tips

入口标识 Signage at the entrance

C: Compatible
I: Incompatible
Caution: Self-Reactive
X: Changed by user

NFPA 2020 化学品反应矩阵 Compatibility Chart

Health	Flammability	Special	AIR, COMPRESSED	AMMONIA, ANHYDROUS	DIMETHYLDICHLOROSILANE	HYDROGEN CHLORIDE, ANHYDROUS	ISOPHORONEDIAMINE	METHANOL	METHYLDICHLOROSILANE	OXYGEN	PROPYLAMINE	SODIUM HYDROXIDE, SOLID	WATER	八甲基环硅氧烷
			AIR, COMPRESSED											
3	1	0	AMMONIA, ANHYDROUS	Y										
3	3	1	DIMETHYLDICHLOROSILANE	C	N									
3	0	1	HYDROGEN CHLORIDE, ANHYDROUS	C	N	N								
			ISOPHORONEDIAMINE	C	Y	N	N							
1	3	0	METHANOL	C	Y	N	C	Y						
4	3	2	METHYLDICHLOROSILANE	C	N	C	N	N	N					
3	0	0	OXYGEN	C	N	N	N	N	N					
3	3	0	PROPYLAMINE	C	Y	N	N	Y	Y	N	N			
3	0	1	SODIUM HYDROXIDE, SOLID	C	Y	N	N	Y	N	N	N	Y		
			WATER	Y	C	N	C	C	Y	N	N	C	C	
			八甲基环硅氧烷	Y	Y	Y	C	Y	Y	C	Y	N	Y	



安全建议 Safety tips

叉车操作员的入职培训

1. 叉车相关主题

- 操作说明、警告
- 车辆控制和仪表
- 操作限制
- 车辆能力和稳定性
- 可见性

2. 工作场所相关主题

- 路面状况
- 斜坡和其他倾斜的路面
- 载货构成
- 货物堆垛/卸货
- 行人通行区域

Forklift operator initial training

Truck related topics

Operating instructions, warnings

Truck controls and instrument

Operating limitations

Vehicle capacity and stability

Visibility

Workplace related topics

Surface conditions

Ramps and other sloped surfaces

Loads composition

Load stacking/unstacking

Pedestrian traffic area



安全建议 Safety tips

叉车驾驶 PIT driving

1. 叉车驾驶员持证上岗
Certified PIT driver
2. 系好安全带
Wear a seat belt
3. 不要骑在叉车上
Do not ride on the forks
4. 在转角按喇叭(安装反光镜)
Sound horn at blind corner (bubble mirror install)
5. 新作业开始时检查装载容量曲线
Check loading capacity curve prior to new work
6. 禁止使用手机
(warehouse change/Change control)
Do not use cell phone
7. 安装蓝灯功能
Blue light feature installed

安全建议 Safety tips

货架存储 Rack storage

1. 货架上有清晰的承载力标识
Clear capacity label on the rack
2. 立柱上所有螺栓孔都安装固定
Bolts anchoring all uprights on the ground
3. 背靠背的货架安装托盘挡块
Pallet stopper for side by side racks
4. 防止货物掉落的防护网/支撑臂
Net/support arm to prevent goods fall through
5. 固定栓定期例行检查
Fixed pin routine inspection
6. 日常货架检查
Daily rack inspection
7. 下层货架安装横梁
Lower beam install for bottom level

安全建议 Safety tips

行人安全 Pedestrian safety

1. 清楚的行人和车辆标识
2. 注意较宽的转弯半径
3. 在十字路口停下脚步
4. 不要站立/行走在抬高货物下
5. 批准的区域外禁用手机
6. 穿反光背心

Clear mark for Pedestrian and PIT

Be aware of wide rear swing radius

Make a Stop at the cross

Do not stand/walk underneath an elevated load

Do not use cell phone outside of approved area

Wear visible PPE



安全建议 Safety tips

预防滑倒、跌倒 Slip, trip and fall

1. 盖住所有电缆、电线
2. 保证所有区域均无杂物
3. 注意/标记泄露和潮湿区域
4. 穿戴个人防护装备

Cover and tape all down cables or cords

Free of debris in all area

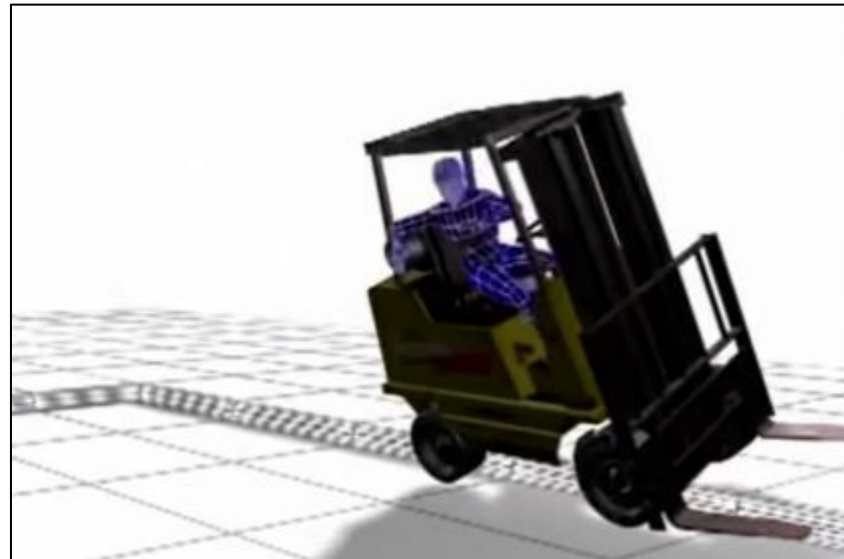
Mind/marks spill and wet area

Wear proper PPE



安全建议 Safety tips

制订应急预案 Emergency response plan available



安全建议 Safety tips

汇报隐患

huì bào yǐn huàn

Report any risk



案例分享 Case study



