Yale

ATEX

COLUMBUS McKINNON

Yale is the leading brand for standard manual hoisting equipment in Europe. As early as 1877, Yale produced the first spur-geared hand chain hoist incorporating the Weston screw-and-disc type load brake – a design principle which is still used today. In 1936, hoist manufacture started in Velbert with the production of the world renowned PUL-LIFT®.

The product range as well as all new and further developments of Yale in the individual product sectors constantly raise the benchmark for quality, reliability and safety.

The comprehensive range of products includes hoists, cranes, load hoisting tackles and crane weighers, balancers, textile lifting and lashing equipment, material handling equipment and load moving systems, hydraulic tools, bolting technology as well as workshop equipment.

The prominently yellow products, which are delivered ready for operation, are used world-wide for the most varied industrial and commercial applications.

www.yale.de

Pfaff-silberblau – the name of this company with its long-standing tradition and history of more than 140 years has become the synonym for power, dynamics and safety.

Material handling equipment as well as rope winches and rack and pinion jacks of the Pfaff-silberblau brand are used wherever high loads need to be lifted, turned or moved in an environment with demanding safety requirements.

In logistics, industrial production or outdoor applications, the innovative products and application-specific designs provide the solution to numerous lifting applications – as standard products, tailor made solutions or as complete systems.

www.pfaff-silberblau.de

The brand Yale has already been a successful partner within the international corporate network of Columbus McKinnon Corporation for more than ten years. Since 2008, the brand Pfaff-silberblau has extended the portfolio of products and services of the company.

Today, the two trademarks of Yale and Pfaff-silberblau are combined under the name of Columbus McKinnon. This enables us to offer a comprehensive product pallet for many challenging applications.

Experience, know-how and innovative strength combined with a far-reaching understanding of user requirements is the formula for success on which our portfolio of hoisting and material handling equipment products has been based for a long time.

Our tradition of close customer relationships and customer services as well as our constant striving for optimisation provide the basis for all new and further developments of the Yale and Pfaff-silberblau brands.

As a premium supplier of two leading brands, we have set ourselves the target of offering our customers high-quality hoisting and material handling equipment that is designed for moving, lifting, positioning and securing heavy loads both ergonomically and safely.

Columbus McKinnon Corporation is the World Leader for products and application know-how that supports customers with lifting, moving and positioning of loads.
The company group is the leading manufacturer and supplier of products and service in the area of materials handling, cranes and rigging attachments. With its 140 year tradition, the company concentrates on commercial and industrial application, by which safety and security are always at the forefront.

Columbus McKinnon Corporation
Corporate Headquarters
205 Crosspoint Parkway
Getzville, New York 14068
www.cmworks.com

Training

As a manufacturer, we have many years of experience in the testing and repair of products in the field of lifting technology. We would like to pass this knowledge on to our customers and offer seminars in our training center in Wuppertal to become a "Qualified Person" according to DGUV regulation 54 for winches, lifting and pulling devices.

The centres offer not only product training but also seminars providing up-to-date insider information and a consolidated knowledge in the usage of rope, lifting and lashing practices.

Modern communication technologies, hands-on experience and well designed training documentation guarantees quick and lasting training success.


COLUMBUS McKINNON

Zertifikat

Herr Max Mustermann
World Industries
Globusstrasse 4 - 8
54321 Wuppertal

hat am 10. Januar 2014
an einer Schulung zur befähigten Person für

Winden, Hub- und Zuggeräte

mit Erfolg teilgenommen.

Er wurde gemäß der BetrSichV und BGV D8 unterwiesen.

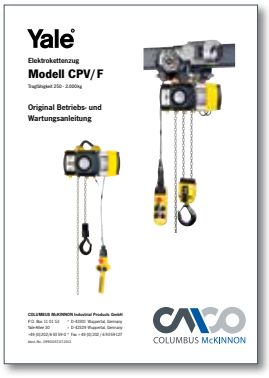
Wuppertal, 10. Januar 2014

COLUMBUS McKINNON Industrial Products GmbH

Schulungsleiter

INFO

If required, training seminars can be held at other locations.


Yale

Elektrokettenzug
Modell CPV/F

Tragfähigkeit 250 - 2.000kg

Original Betriebs- und Wartungsanleitung

COLUMBUS McKINNON Industrial Products GmbH
P.O. Box 10 01 53 · D-42201 Wuppertal, Germany
Nürnberger Str. 62 · D-42279 Wuppertal, Germany
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COLUMBUS McKINNON


Yale

Original Betriebsanleitung
Translated Operating Instructions.
Traduction de mode d'emploi

Stirnradflaschenzug
Hand chain hoist
Palans à main

Yalelift 360
WLL 500 - 20.000kg

COLUMBUS McKINNON

Certified security

You are in safe hands - Every unit is supplied with operating instructions, CE declaration of conformity resp. manufacturers works test certificate, which confirms the perfect tested status of the product.
Additional documentation, e.g. spare parts manuals or maintenance and repair instructions are available on request or at our homepage.

www.yale.de

Offering advice

Our qualified personnel are there for you around the globe at all our locations, as well as specialised dealers who provide competent know-how and service.

Business hours:

Monday - Thursday 08:00 a.m. - 04:30 p.m.
Friday 08:00 a.m. - 03:30 p.m.

Shipping:

Monday - Thursday 06:30 a.m. - 04:30 p.m.
Friday 06:30 a.m. - 03:00 p.m.

EN ISO 9001

Columbus McKinnon Industrial Products GmbH manufactures world wide according to uniform, controlled standards of EN ISO 9001. This is a guarantee for our business partners that given standards in design and development, manufacturing, assembly and service are complied with.

Certified since November 1991

Special documentation

Additional inspections with test report 2.2 resp. inspection certificate 3.1.B according to EN 10204, GOST R certificates or specific pre-shipment inspections e.g. by DNV or GL can be carried out at cost on request.

The roots of explosion protection lie in the mining industry where the miners are in danger from firedamp, which describes the methane gas escaping underground. The fine coal dust reacts with the air creating an explosive mixture (firedamp explosion).
Explosive atmospheres may however occur in other branches of industry too, for example in the chemical or petrochemical industries. Not only electrical equipment, but also non-electrical equipment must be designed in a way that they cannot form effective ignition sources.

In order to avoid serious injuries and damage to material and the environment, safety regulations, laws, decrees and standards have been established in most states. Hence a high degree of safety has developed in explosion protection across the world. As the physical laws regarding the occurrence of explosions and the measures taken to prevent them are based on similar principles everywhere, the aim is to harmonise approval conditions and regulations regarding conformity on international level.

This brochure merely outlines the European explosion protection directives which however, correspond largely to the international IECEx regulations. It cannot take the place of an intensive analysis of national legal principles and standards, though.
The explosion protection of electrical and non-electrical machines is an important prevention measure for the safety of persons and production, storage and distribution facilities of all kinds, wherever mixtures of flammable gases or dusts and air occur.

ATEX

Examples of explosion hazards in different industries:

Chemical industry

Energy supply

Shipbuilding

Offshore industry

Waste disposal and recycling companies

Gas supply companies

Metal processing companies

Wood processing companies

Paint shops

Agriculture

Food and feed industry

Pharmaceutical industry

Refineries

ATEX

By defining the ATEX product directive 2014/34/EU (ATEX 95) and the ATEX user directive 1999/92/EC (ATEX 137) the European Community has established the basis for uniform European explosion protection.

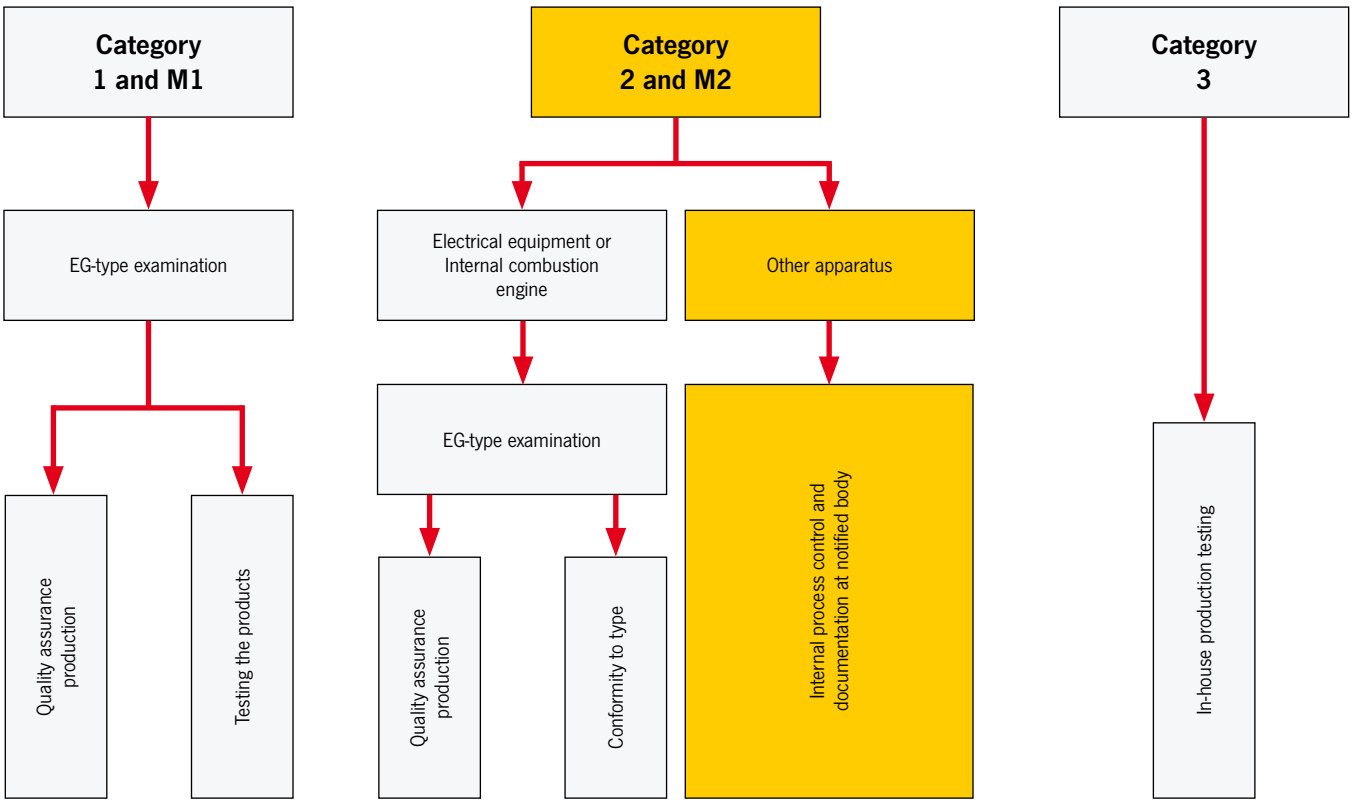
This safety concept is applicable both for manufacturing electrical and non-electrical apparatus and for operating this apparatus in the respective industrial plants. The legislators of the individual member countries implement these directives in equivalent statutory regulations.

In Germany for example these are the Explosion Protection Ordinance ExVO (implementation of directive 2014/34/EU), the Industrial Safety Ordinance (implementation of directive 1999/92/EC) and the Technical Regulations for Industrial Safety (TRBS), the regulations issued by the Employers' Liability Insurance Associations (e.g. BGR 104, BGR 109 and BGR 132), the Employers' Liability Insurance Association information sheets (e.g. BGI 740) and the regulations issued by the VDI (Association of German Engineers) (e.g. 2263 and 3673).

ATEX directive 2014/34/EU defines the properties required by apparatus for safe use in explosive areas.

This includes classification into equipment groups and categories, the respective conformity assessment procedures to be followed, manufacturers' responsibility including EU conformity marking, basic safety requirements for the development and manufacture of explosion-protected equipment and recognised quality management measures to be implemented during production.

ATEX directive 99/92/EC defines the obligations of users and employers for employees' protection in explosive areas. Furthermore, the user must assess the risk and classify the potentially explosive areas into corresponding zones so that the apparatus required by directive 2014/34/EU can be used in safety.



IECEx

The international IECEx scheme also aims to assess conformity and certify apparatus, systems and services for use in explosive areas. The IECEx system, introduced in 1996, supports the standardisation of norms and the issuing of certificates of conformity (CoC) unrelated to specific countries or regions, in order to simplify the free global movement of goods. There is an extensive agreement as to classes and requirements between the European ATEX directives and the IECEx regulations.

IECEx is of great importance outside Europe. A total of 26 countries have acceded to IECEx and there are 34 recognised IECEx certification bodies (ExCB) and 36 recognised test laboratories (ExTLs) around the world. In countries which recognise IECEx, apparatus with the corresponding certification can be commissioned without further testing.

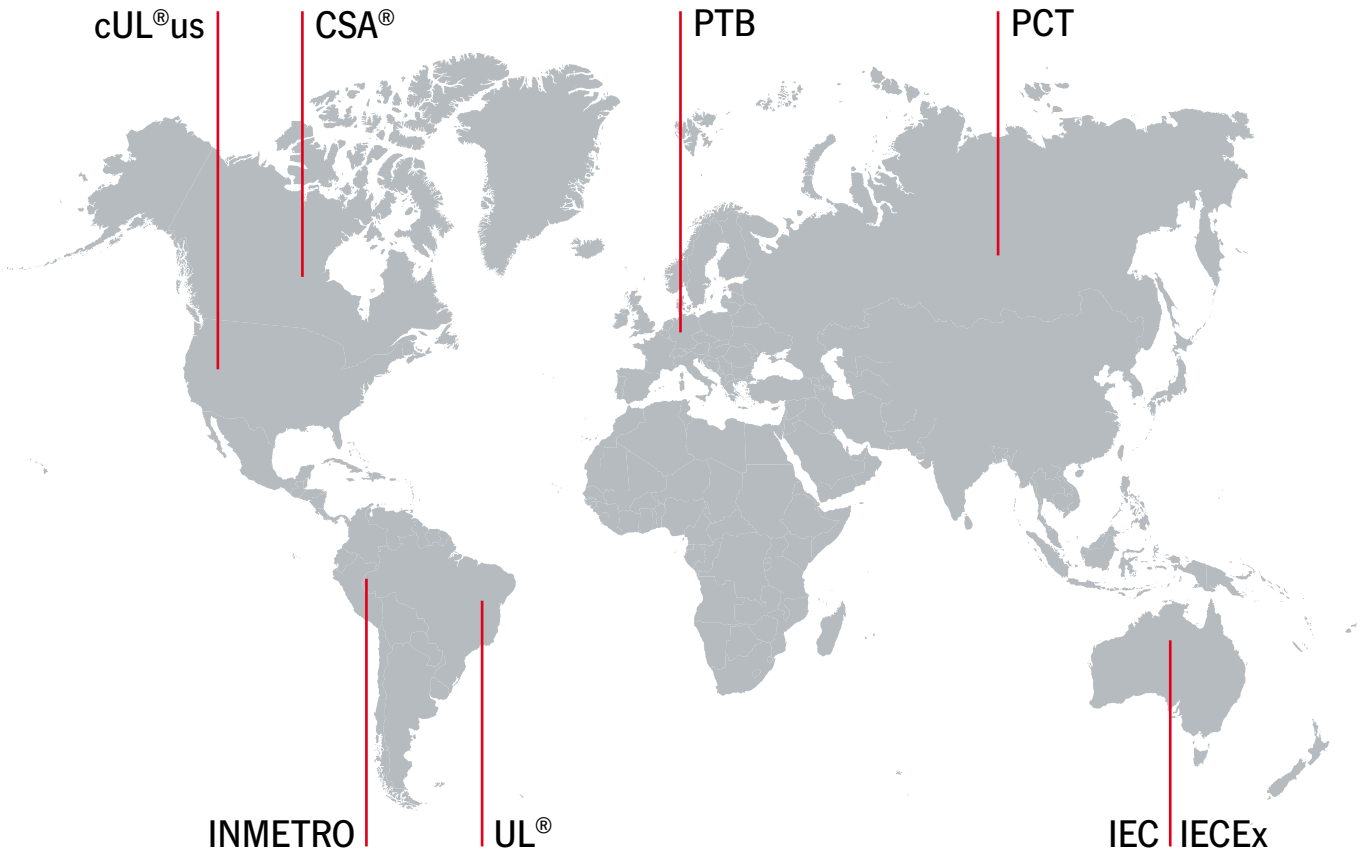
At present, however, IECEx is still used in most cases only for electrical equipment.

You will find further information on the IECEx system and its provisions including regulations, handbooks and procedures at:
www.iecex.com

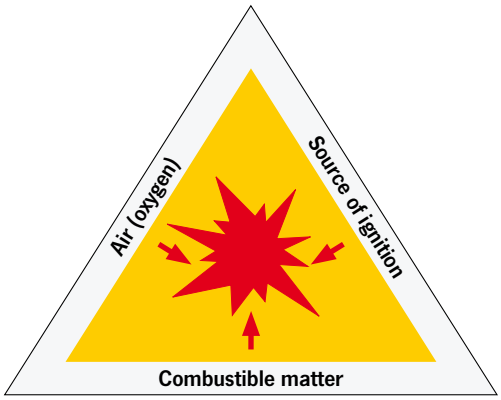
ATEX and IECEx in comparison

System	ATEX legally required in the EU	IECEx on a voluntary basis in the EU
Inspection and conformity of **non-electrical equipment**	**Equipment category 2* and 3** • Internal process control • EU Declaration of Conformity • CE marking *Documentation deposited at notified body	**Equipment protection level (EPL a, b, c)** not yet clarified, in all probability similar to electrical devices Standard: ISO 80079-36 and -37
Certificate	Certificate with deposit number of the notified body	IECEx Online Database
Repair workshops	is regulated nationally (no EU-certified workshops)	Certified Service Facilities
Service personal	is regulated nationally (no EU-certified personnel)	Certfied Competent Employees

International testing authorities



Explosive atmospheres can occur wherever flammable gases, vapours, mist or dust can be generated. This is a mixture which, when it encounters the oxygen in the air, undergoes a reaction which can trigger an explosion at the slightest spark (e.g. a hot surface).



It is therefore important to avoid ignition or to minimize the effects of an explosion to a safe level. Therefore, all equipment which will be used in potentially explosive atmospheres must be designed, produced and marked in accordance with the applicable regulations and standards.

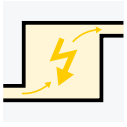
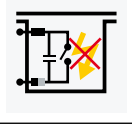
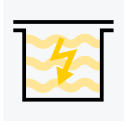
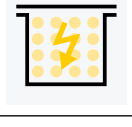
The classification of the devices into groups and categories according to the ATEX directive or EPL according to IECEx standards results from their areas of application or the degree of safety of the protective measures and the frequency of occurrence of an explosive atmosphere.

The manufacturer must test the product under the most unfavorable conditions in order to eliminate potential ignition sources. In areas where an explosive atmosphere may occur, only explosion-proof equipment may be used.

This equipment, both electrical and non-electrical, is designed in accordance with the corresponding standard series DIN EN IEC 60079 and DIN EN ISO 80079 in various types of protection. The ignition protection type selected by the manufacturer depends on the type and function of the device. All standardized ignition protection types within a category are equivalent.

The manufacturer confirm that the product complies with the ATEX directives. The EU makes the declaration of conformity accompanying the technical documentation.

Types of protection for non-electrical equipment in explosive atmospheres

Type of protection	Symbol new	Diagram	Main application	Standard
basic methods and requirements				ISO 80079-36 EN ISO 80079-36
constructional safety „c“	h		couplings, pumps, gear drives, chain drives, belt drives old marking according to EN 13463-5: c	ISO 80079-37 EN ISO 80079-37
control of ignition sources „b“	h		pumps, belt drives old marking according to EN 13463-6: b	ISO 80079-37 EN ISO 80079-37
liquid immersion „k“	h		submerged pumps, gears old marking according to EN 13463-8: k	ISO 80079-37 EN ISO 80079-37
flameproof enclosures „d“	h		brakes, couplings old marking according to EN 13463-3: d	IEC 60079-1 EN 60079-1
protection by enclosure „t“	h		equipment for explosive dust atmospheres	IEC 60079-31 EN 60079-31
pressurized enclosure „p“	h		pumps	IEC 60079-2 EN 60079-2

ATEX directive 1999/92/EC defines users' obligations for the protection of employees working in potentially explosive atmospheres. The user is obliged to establish technical and organisational measures to prevent explosions occurring.

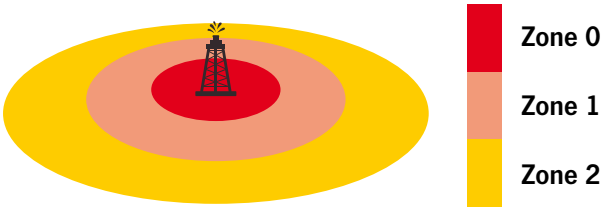
In this respect he must for example assess the potential danger and explosion risk, ensure that the working environment has been designed for safety and classify the hazardous areas into zones in accordance with the directives for safe operation of the apparatus which has been classified into categories.

In addition, he is obliged to issue and maintain an explosion protection document.

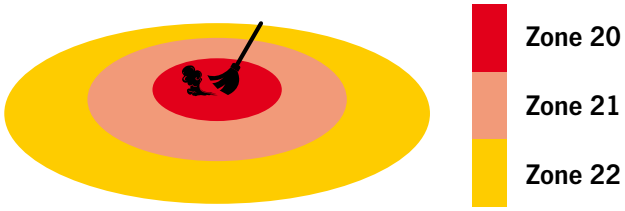
Naturally further issues are defined in directive 1999/92/EC in order to implement explosion protection effectively. After a system has been commissioned in due form it must be monitored and maintained so that the safe condition of the system is ensured and all dangers can be excluded. The plant's expert has product-specific documents (rating plate, operating instructions, EC prototype test certificate, declaration of conformity, etc.) and universally valid documents (legal ordinances, industrial safety ordinance, technical regulations TRBS, norms and standards, etc.) at his disposal.

The full product-specific documentation must be managed and retained throughout the period of use of the apparatus and placed at the disposal of the experts entrusted with maintenance work.

Gases, mists and vapors

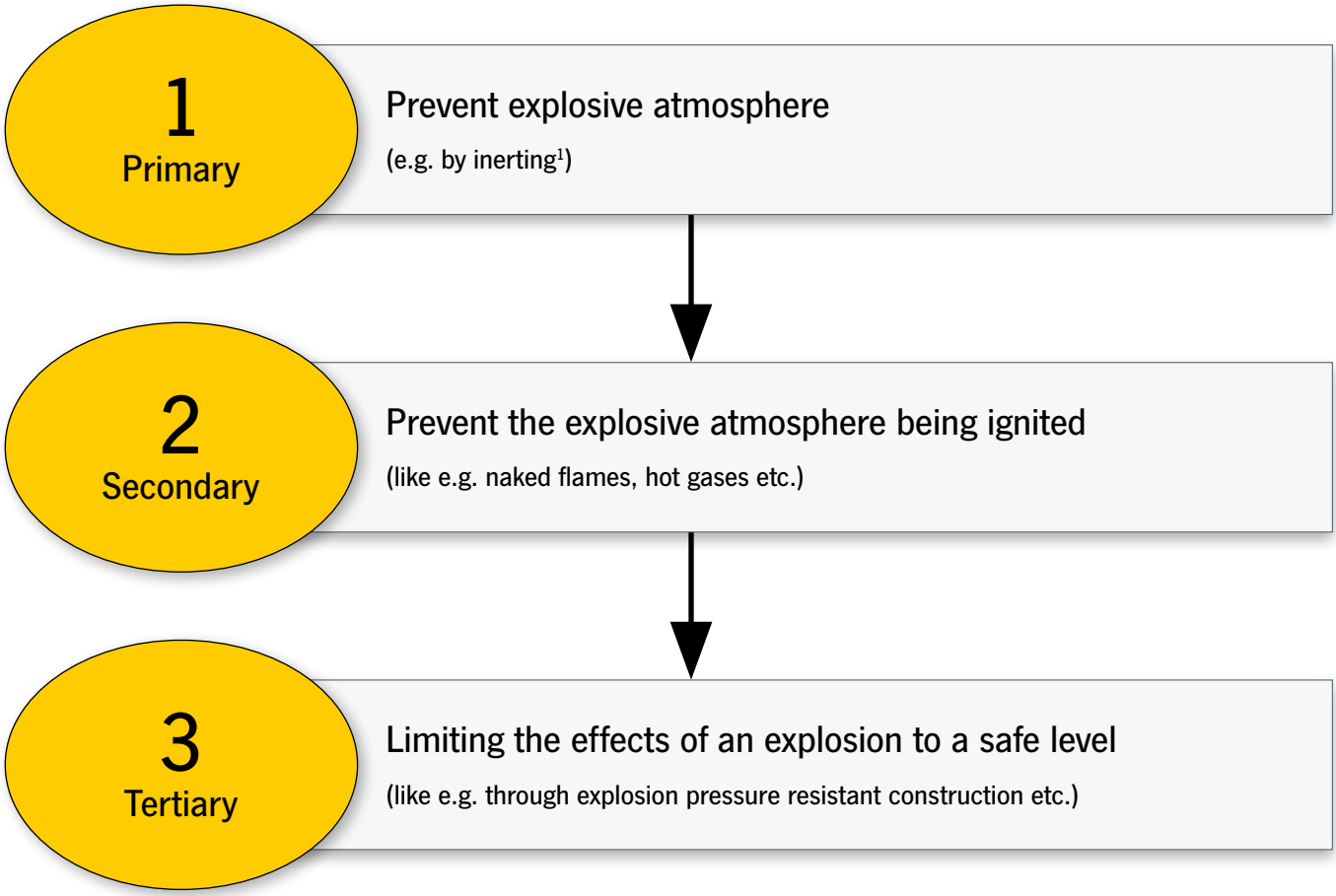


Dust



Principle of integrated explosion protection

Explosion protection measures have to be taken in a certain order.



[1] Inerting substances

Inerting substances means their transformation or processing into slow-reacting (inert) substances. Inert substances are, for example, inert gases, glass and porcelain. In refuse dump systems, inerting is used, for example, to render hazardous waste substances harmless. Substances containing heavy metal, which are radioactive or otherwise detrimental, are, for example, often glazed in order to make it possible to finally dispose of them.

Inerting rooms

Inerting rooms means to displace the oxygen contents in the air or potentially reactive or explosive gases or gas mixtures in rooms by adding inert gases or vapours. When inerting as a protection against fire and explosion (industry example: chemicals storage or production facilities), the oxygen contents in the air are displaced by adding inert gas (e.g. argon, nitrogen, carbon dioxide) in order to prevent an explosive atmosphere. In fire protection, this is also called “active fire prevention by permanent inerting”.

Equipment for potentially explosive atmospheres is divided into groups, categories and temperature classes in Directive 2014/34/EU. This is necessary because the same requirements do not have to be placed on equipment for every application and for every hazard level.

Equipment category and equipment protection level (EPL)

According to EU directive 2014/34/EU (ATEX)		According to IEC and CENELEC	Sufficient safety	
Equipment group	**Equipment category**	**EPL**		
Mines susceptible to firedamp				
I	M1	Ma		during rare malfunctions
I	M2	Mb		until de-energizing of the equipment
Explosive gas atmosphere				
II	1G	Ga	Zone 0	during rare malfunctions
II	2G	Gb	Zone 1	during expected malfunctions
II	3G	Gc	Zone 2	in normal operation
Explosive dust atmosphere				
II	1D	Da	Zone 20	during rare malfunctions
II	2D	Db	Zone 21	during expected malfunctions
II	3D	Dc	Zone 22	in normal operation

Groups

IEC/CENELEC/NEC 505/NEC 506		NEC 500	
Group I	**Mines susceptible to firedamp**		––
	Methan		
Group II	**Explosive gas atmosphere**		**Class I**
Subdivisions	**typisches Gas**		**Subdivisions**
IIA	propane	propane	Class I, Group D
IIB	ethylene	ethylene	Class I, Group C
IIC	hydrogen	hydrogen	Class I, Group B
	acetylene	acetylene	Class I, Group A
Group III	**Explosive dust atmosphere**		**Class II, Class III**
Subdivisions	**Typical dust**		**Subdivisions**
IIIA	combustible flyings	fibers/flyings	Class III
IIIB	non-conductive dust	non-conductive dust	Class II, Group G
IIIC	conductive dust	carbonaceous dust	Class II, Group F
		combustible metal dust	Class II, Group E

The ignition temperature is the lowest temperature of a heated surface at which the ignition of a gas/air or vapour/air mixture occurs. In other words, it is the lowest temperature at which a hot surface can ignite the corresponding explosive atmosphere.

The maximum surface temperature of the equipment must therefore always be lower than the ignition temperature of the gas/air or vapour/air mixture.

Temperature classification

Maximum surface temperature	Gas temperature classes		Maximum surface temperature	Gas temperature classes	
	Equipment marking			Equipment marking	
	NEC 500	CENELEC/ IEC/NEC 505		NEC 500	CENELEC/ IEC/NEC 505
450°C	T1	T1	200°C	T3	T3
300°C	T2	T2	180°C	T3A	
280°C	T2A		165°C	T3B	
260°C	T2B		160°C	T3C	
230°C	T2C		135°C	T4	T4
215°C	T2D		120°C	T4A	
Dust: indication of the max. surface temperature in °C.			100°C	T5	T5
			85°C	T6	T6

Dust cannot be classified as finely as the chemically defined gases and vapours. Therefore, dusts are classified according to their type and conductivity. EN ISO IEC 80079-20-2 describes the test method for determining the specific electrical resistance of dusts.

Dusts are divided into 3 subgroups according to their resistance:

IIIA combustible flyings

IIIB non-conductive combustible dust
with a specific electrical resistance $> 10^3\ \Omega$

IIIC conductive combustible dust
with a specific electrical resistance $< 10^3\ \Omega$

The minimum ignition energy of combustible dusts is determined according to IEC 61241-2-3.

Ignition and glow temperature of dusts:

Category	Substance	$T_{zünd}$ [°C]	T_{glimm} [°C]
Dusts from natural products	Wood	≥ 410	≥ 200
	Coal	≥ 380	≥ 225
	Milk powder	≥ 440	≥ 240
	Paper	≥ 540	≥ 300
Dusts from chemical-technical products	Petroleum coke	≥ 690	≥ 280
	Sulfur	≥ 280	≥ 280
Metal dusts	Aluminium	≥ 530	≥ 280
	Iron	≥ 310	≥ 300

Safety characteristics of dusts

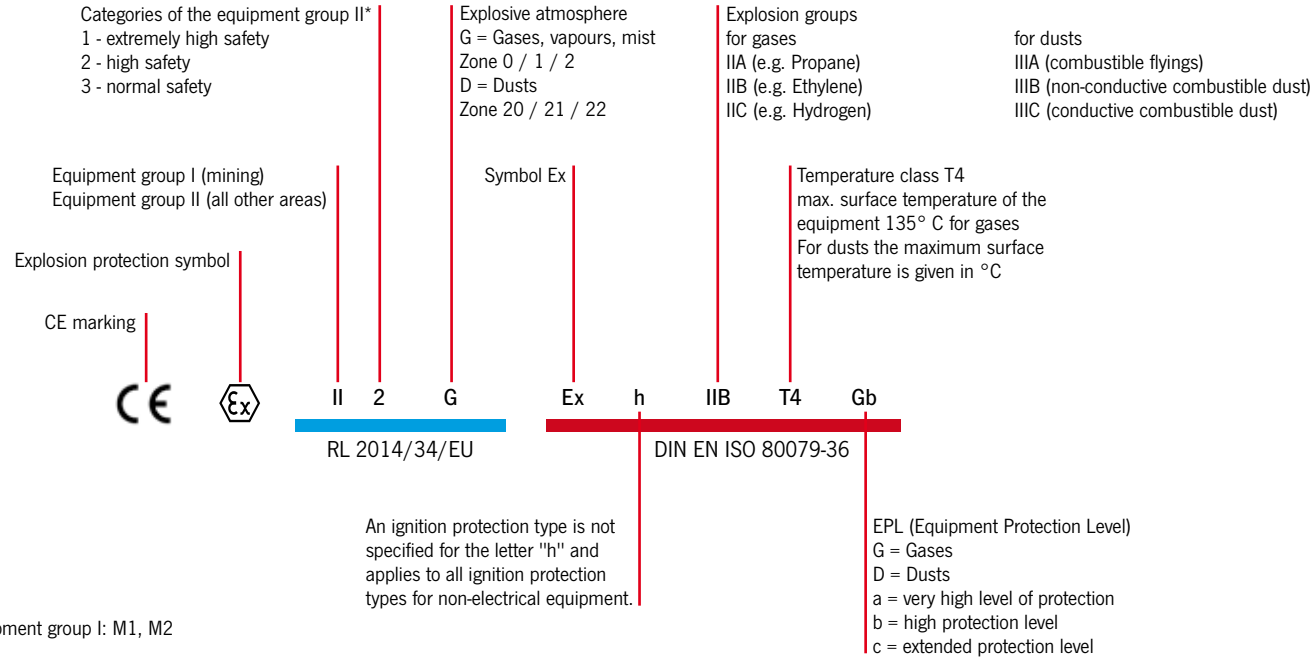
Characteristic	Definition/description	Remarks
Particle size	Dust with a particle size larger than 400 µm is not considered to be ignitable. Dust particles are ignitable when they measure less than 20 µm up to 400 µm.	Due to abrasion, the transportation and processing of coarse dust result in the formation of fine dust.
Explosion limits	For most dust/air mixtures of combustible substances the lower explosion limit is approx. 20... 60 g/m³ air and the upper explosion limit approx. 2... 6 kg/m³ air.	In this case allocation of particle size, density, humidity as well as the ignition point is decisive.
Maximum explosion pressure	In enclosed containers of simple design, combustible dust can reach explosion pressures of 8... 10 bar.	For light metal dusts the explosion pressure can exceed this value.
KSt value	This is a classification value which expresses the shattering effect of the combustion. Numerically, it is equal to the value of the maximum rate of explosion pressure rise during the explosion of a dust/air mixture in a 1 m³ vessel.	This value is the basis for calculating explosion pressure relief surfaces.
Moisture	The moisture of dust is a significant factor for its ignition and explosion behaviour. Currently it is only known that a higher moisture content requires a higher ignition energy and impedes the formation of dust swirls.	
Minimum ignition energy E_{min}	Lowest energy of an electrical spark which is sufficient to effect ignition of the critical (most easily ignitable explosive) dust/air mixture under defined framework conditions.	Not every spark is ignitable. The decisive factor is whether sufficient energy is introduced into the dust/air mixture to initiate a self-sustaining combustion of the entire mixture.
Ignition temperature $T_{zünd}$	The lowest temperature of a hot inner wall (e. g. furnace) on which the dust/air mixture is ignited after brief contact. The surface temperature must not exceed 2/3 of the ignition temperature in ° C of the relevant dust/air mixture, e. g. starch/milk powder/gelatine: Ignition temperature 390 °C x 2/3 = 260 °C max. permissible surface temperature $T_{max} \leq \frac{2}{3} T_{zünd}$	
Smouldering temperature T_{glimm}	The lowest temperature of a hot surface on which ignition occurs in a dust layer with a thickness of 5 mm. On surfaces where a dangerous deposit of ignitable dust is not effectively prevented, the surface temperature must not exceed the ignition temperature reduced by 75 K of the respective dust. With layer thicknesses over 5 mm, a further reduction of the temperature of the surface is necessary: e. g. wood, grinding dust Ignition temperature 290 °C - 75 °C = 215 °C max. permissible surface temperature $T_{max} \leq T_{glimm} - 75\,K$	The smoldering temperature is usually well below the calculated ignition temperature of a dust cloud. The smoldering temperature decreases almost linearly with an increase in the layer thickness. For acceptable surface temperatures safety clearances have to be adhered to.

As a result of the current series of standards, a new marking is also required for non-electrical equipment, which is structured as follows:

Non-electrical equipment

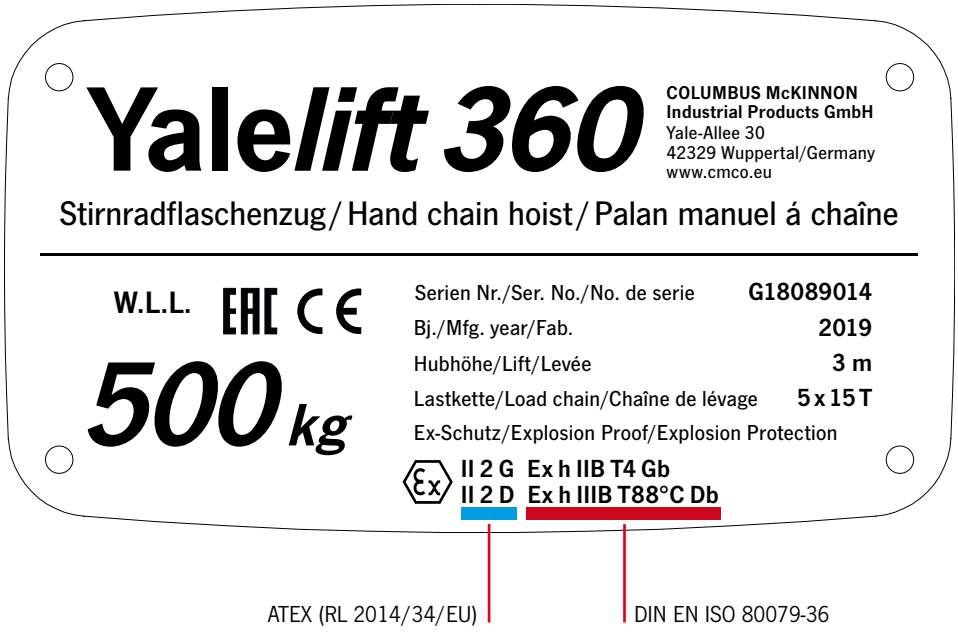
Labeling new							
Gases	Ex	II 2 G	Ex	h	IIB	T4	Gb
Vapours	Ex	II 2 D	Ex	h	IIIB	T135°C	Db
Labeling old							
Gases		II 2 G		c k	IIB	T4	
Vapours		II 2 D		c k	IIB	T135°C	

Identification key



*Equipment group I: M1, M2

Type label



Explosion groups and temperature classes of some gases and vapours (selection)

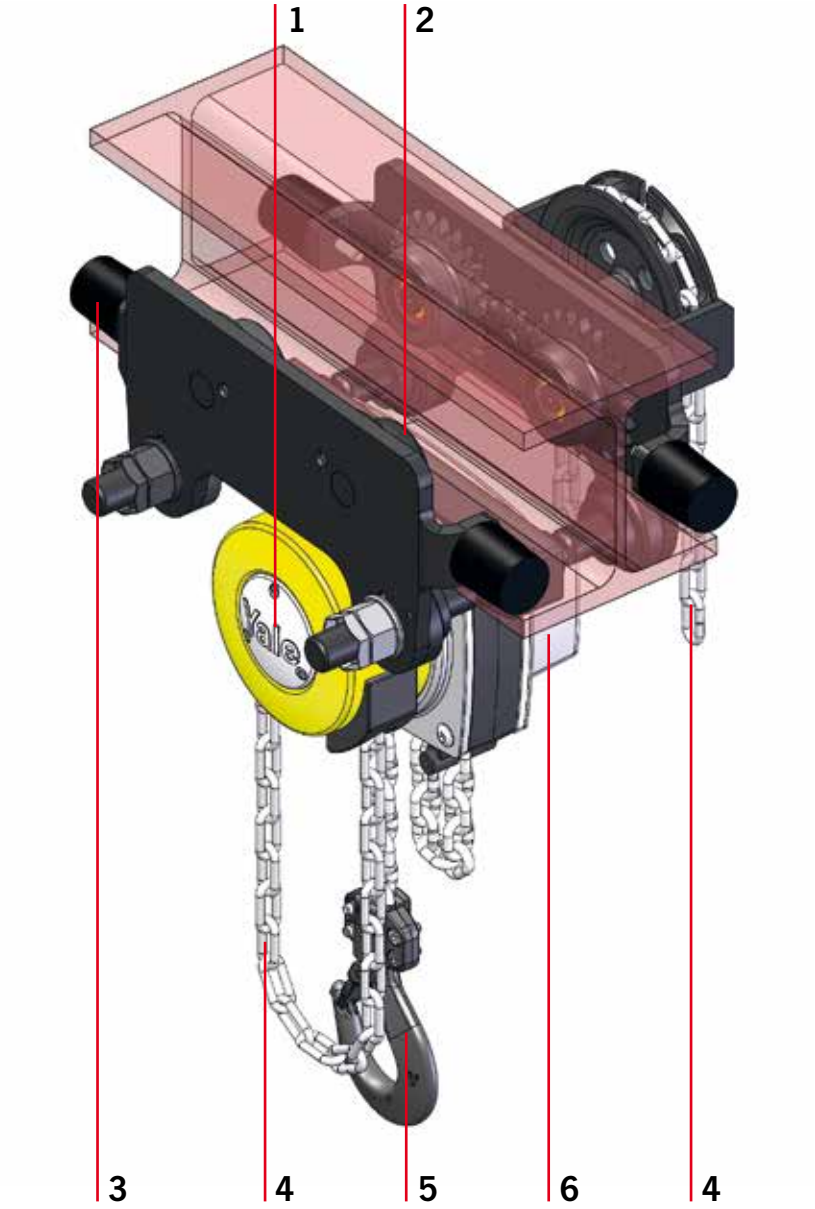
Classification of combustible gases, vapours, mists

Ex group	Temperature classes					
	T1	T2	T3	T4	T5	T6
	Ignition temperature range of the mixtures					
	> 450 °C	> 300 ≤ 450 °C	> 200 ≤ 300 °C	>135 ≤ 200 °C	>100 ≤ 135 °C	>85 ≤ 100 °C
	Permissible max. surface temperature of the equipment					
	450 °C	300 °C	200 °C	135 °C	100 °C	85 °C
IIA	Acetone	Ethanol	Petrol (general)	Acetaldehyde		
	Ammonium	i-Amyl acetate	Diesel fuels			
	Benzene (pure)	n-Butane	Aircraft fuels			
	Acetic acid	n-Butanol	Fuel oil DIN 51603			
	Ethane	Cyclohexan	n-Hexane			
	Ethyl acetate	Acetic anhydride				
	Ethyl chloride					
	Carbon monoxide					
	Methane					
	Methanol					
	Methyl chloride					
	Naphthalene					
	Phenol					
	Propane					
	Toluene					
IIB	City gas	Ethylene	Ethylene glycol	Ethyl ether		
		Ethylene oxide	Hydrogen sulfide			
IIC	Hydrogen	Acetylene				Carbon disulphide

In lifting and driving technology there are non-electrical components and parts that can cause an explosion in a potentially explosive atmosphere.

Columbus McKinnon Industrial Products GmbH therefore offers non-electrical equipment that is specially designed for the use in potentially explosive gas and dust atmospheres. This is done in accordance with the currently valid guidelines and standards.

All Atex products have been classified according to the ignition hazard assessment for categories 2 and 3 or M2 and the corresponding documentation is deposited with TÜV Rheinland. A corresponding certificate can be supplied upon customer request.



1 Load brake system

To reduce the temperature (hot surface) a cooling hub is additionally used on the Yalelift 360 series. This allows the temperature to be better dissipated.
This is not necessary for all other models.

2 / 3 Trolley wheels and buffers

From the **Medium** version upwards, they are made of solid bronze.
Basic trolley wheels are MKS coated (micro corrosion protection system). In addition, all trolleys are fitted with buffers to prevent mechanically generated sparks when hitting the end points.

4 Hand chain

The hand chains used on all hand chain hoists and geared trolleys are made of stainless steel. This applies to **Basic**, **Medium** and **High**.

INFO

The protection type is constructive safety "c".

5 Bottom block and top hook

All bottom blocks from **Medium** upwards are copper plated. This also applies to the corresponding top hooks. The bottom blocks and top hooks are MKS coated on **Basic**.

6 Gearbox

For all manual hoists, the gearbox is sufficiently greased. On the OMEGA Atex model and all air pressure chain hoists, the gear parts run in oil, so the liquid encapsulation "k" is added here. Lubrication (grease or oil) prevents sparking in the gear unit.

Design
Protection classification
Pneumatic chain hoist model CPA ATEX 1-13 / 2-10 / 5-5 / 10-9
Pneumatic chain hoist model CPA ATEX 20-8 bis 100-3
Hand chain hoist model Yalelift 360 ATEX
Hand chain hoist with integrated push or geared type trolley model Yalelift 360 IT ATEX
Hand chain hoist with integrated push or geared type trolley (low headroom) model Yalelift 360 LH ATEX
Push and geared trolley model HTP/G ATEX
Ratchet lever hoist model CD85 ATEX
Ratchet lever hoist model UNOplus-A ATEX
Wall-mounted rack and pinion jacks model ZWW-L ATEX

NOTE: The measured maximum surface temperatures can be taken from the corresponding operating instructions or the name plate! This only applies when using the units in dusty conditions.

	BASIC	MEDIUM	HIGH	MINING
	II 3 G Ex h IIA T4 Gc II 3 D Ex h IIIA T135°C Dc	II 2 G Ex h IIB T4 Gb II 2 D Ex h IIIB T135°C Db	II 2 G Ex h IIC T4 Gb II 2 D Ex h IIIC T135°C Db	I M2 Ex h Mb
			on request	
	see page 46			

INFO

Due to the use of stainless steel load chains for the HIGH design a reduction of the load capacity is necessary. Please do refer to the table "technical data" for appropriate values.

BASIC

- Load chain galvanic zinc-plated, stainless steel hand chain
- Trolleys with buffers
- Brake with cooling element (Yalelift range only)

MEDIUM

- Load chain galvanic zinc-plated, stainless steel hand chain
- Top and load hook copper-plated
- Trolleys equipped with buffers and bronze trolley wheels
- Brake with cooling element (Yalelift range only)

HIGH

- Stainless steel load and hand chain
- Load and top hook copper-plated
- Trolleys equipped with buffers and bronze trolley wheels
- Brake with cooling element (Yalelift range only)