



## *Information about HADEF hoists in explosion-proof configuration*

## Information about hoists in explosion-proof configuration

EU-Directive 94/9/EG was issued 1994 in order to standardize rules for explosion protection. It determines requirements for explosion-proof equipment and protection systems laying down fundamental safety requirements (GSA) for member states of the European Union. These rules are also known as ATEX 95.

This directive is valid for all industrial areas with risk of explosion, including mining and also refers to explosive dust and is valid for all electric as well as mechanic equipment and protection systems. Furthermore, the directive determines equipment categories as well as certification and marking.

In areas with risk of explosion only equipment must be used that complies with the requirements and is marked suitably. EU-Directive 94/9/EG is valid since 01.03.1996 for putting explosion-proof operating material into circulation.

HEINRICH DE FRIES GmbH offers explosion-proof hoists according to Machine Directive 94/9/EG (ATEX 95).


Since 2003, according to ATEX 95 regulations (EG-Directive 94/9/EG), it is up to the responsibility of the manufacturer to produce its hoists in compliance with the valid rules and regulations for explosion-proof operating material, to classify them into EX-classifications and to mark them accordingly.

HADEF explosion-proof equipment is suitable for the following EX-classifications or lower classifications:

### Manual and Pneumatic Equipment

-  II 2G IIB c T4 for gas
-  II 2D c 135°C for dust
-  II 2G IIB c T3 for gas
-  II 2D c 200°C for dust

### Electric Equipment

-  II 2G IIB c T4 for gas
-  II 2D c 135°C for dust
-  II 2G IIB c T3 for gas
-  II 2D c 200°C for dust

Our sales team can give advice regarding the selection of the equipment that can be supplied for the desired EX-classification.



**It is up to the responsibility of the owner to determine the classification which is needed for the purpose of use.**

The relevant directives and prescriptions (i.e. of the Association of chemistry, etc.) that apply for installation, assembly and operation of explosion-proof equipment must be adhered by the owner.

This brochure is an extract and gives an overview of the use of equipment in area prone to explosion. It does not replace acquisition of specialized knowledge regarding the relevant directives and standards that apply.

## HADEF Hoists in explosion-proof configuration

In mining, chemical industry and other industries it may be needed to use explosion-proof equipment. Emission of combustible gas, vapour, mist or dust forms an explosive atmosphere in connection with oxygene/air mixture. When this ignites there is an explosion which can cause severe injury of persons or damage to equipment.

HADEF offers explosion-proof hoists for the following maximum conditions of use in area with risk of explosion.

### Manual and Pneumatic Equipment

Equipment class II  
Equipment category for gas 2G + 3G  
Equipment category for dust 2D + 3D  
Zone 1; 2 + 21; 22  
Explosion group for gas IIB  
Temperature class T3 or T4  
Explosion group for dust  
Temperature class 135°C or 200°C

### Electric Equipment

Equipment class II  
Equipment category for gas 2G + 3G  
Equipment category for dust 2D + 3D  
Zone 1; 2 + 21; 22  
Explosion group for gas IIB  
Temperature class T3 or T4  
Explosion group for dust  
Temperature class 135°C or 200°C



**HADEF hoists must not be used for IIB-Gas „hydrogen sulphide“ and „ethylene oxide“ as well as light metal dust and impact-sensitive dust.**

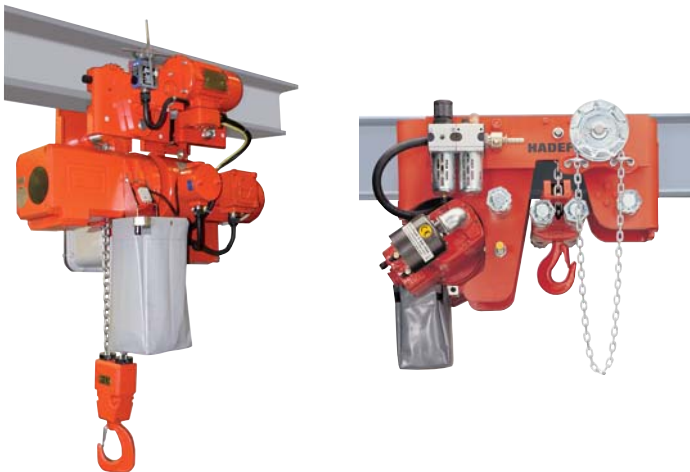



**ATTENTION!**



It is not allowed to use explosion-proof equipment when there is explosive atmosphere with gas and dust at the same time.

HADEF offers manual chain hoists, electric and pneumatic chain hoists in compact design, low and ultralow headroom configuration as well as trolleys and winches in explosion-proof version.



Explosion-proof hoists are marked with  in HADEF price catalogues.

Prices for these hoists are available on request.

## General Information

### EX Zones

Areas with explosion hazard are classified in zones. Information about explosion zones are given in IEC 60079-10 and in the national standards. The following table shows the zones in relation to the equipment category.

Gas Mist Vapour	Equipment category	Dust	Equipment category	Explosive atmosphere exists...
Zone 0	1G	Zone 20	1D	permanently, long lasting or often
Zone 1	2G	Zone 21	2D	from time to time
Zone 2	3G	Zone 22	3D	seldomly or shortly

G= gas D= dust

HADEF offers equipment suitable for zones 1; 2 resp. 21; 22.

### Explosion Groups for Gas

Combustible gases and vapours can be classified into the following temperature classes according to their inflammability.

Substance	Inflammation temperature	Temperature class	Explosion group
Acetone	540°C	T1	IIA
Ammonia	630°C	T1	IIA
Benzol (pure)	555°C	T1	IIA
Ethanoic Acid	485°C	T1	IIA
Ethane	515°C	T1	IIA
Ethylacetat	460°C	T1	IIA
City gas (lighting gas)	560°C	T1	IIB
Hydrogen Sulphide	270°C	T3	IIB
Hydrogen	560°C	T1	IIC
Ethanol	425°C	T2	IIB
Acetylene	305°C	T2	IIC
Heating Oil	300°C	T3	IIA
Ethanal	140°C	T4	IIA
Ethyl Ether	180°C	T4	IIB

Extract from the temperature table for gas

### Temperature Classes

The maximum temperature of the hoist must always be lower than the inflammation temperature of the gas/vapour air mixture. It is possible to use the hoists in lower temperature classes if they are classified for higher temperature classes. HADEF hoists are not suitable for temperature class T5 for gas/air mixtures and for temperature class T6 i.e. carbon disulphide (IIC) as this only applies seldomly.

Temperature class	Inflammation temperature of gas °C	max. surface temperature of hoist °C
T1	>450	450
T2	>300 <450	300
T3	>200 <300	200
T4	>135 <200	135
T5	>100 <135	100
T6	>85 <100	85

## Selection of hoists in explosion-proof configuration

In areas with hazard of explosion by combustible dust, the maximum surface temperature of the hoist may not exceed 2/3 of the inflammation temperature (in °C) of the dust/ air-mixture. HADEF hoists are suitable for use in areas with environmental temperature between – 20°C and + 40°C.

The following HADEF equipment can be supplied in explosion-proof configuration:		max. EX class for gas or dust
<b>HADEF Monorail Trolleys</b>		
- push travel trolley	Type 19/90	II 2G IIB c T4 / II 2D c 135°C
- hand geared trolley	Type 22/90	II 2G IIB c T4 / II 2D c 135°C
- push travel-/ hand geared- and pneumatic trolley	Type 20/94	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Spur Gear Hoists</b>		
- capacities up to 10t/4	Type 9/98	II 2G IIB c T4 / II 2D c 135°C
- capacities from 10t/2 up	Type 9/98	II 2G IIB c T3 / II 2D c 200°C
<b>HADEF Spur Gear Hoists combined with Trolley</b>		
- with push travel and hand geared trolley up to 10t/4	Type 24/98	II 2G IIB c T4 / II 2D c 135°C
- with hand geared trolley from 10t/2 up	Type 24/98	II 2G IIB c T3 / II 2D c 200°C
<b>HADEF Spur Gear Hoists combined with Trolley – low headroom configuration</b>		
- with push travel and hand geared trolley up to 5t/3	Type 28/98	II 2G IIB c T4 / II 2D c 135°C
- with hand geared trolley from 10t/2 up	Type 28/98	II 2G IIB c T3 / II 2D c 200°C
<b>HADEF Spur Gear Hoists combined with Trolley – ultralow headroom configuration</b>		
- with hand geared trolley up to 6,3t/4	Type 29/98	II 2G IIB c T4 / II 2D c 135°C
- with hand geared trolley from 10 t/2 up	Type 29/98	II 2G IIB c T3 / II 2D c 200°C
<b>HADEF Pneumatic Chain Hoists</b>		
- stationary - with push travel-/ hand geared- and pneumatic trolley	Type 70/06	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Pneumatic Chain Hoists combined with Trolley – low headroom configuration</b>		
- with push travel-/ hand geared- and pneumatic trolley	Type 28/06	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Pneumatic Chain Hoists combined with Trolley – ultralow headroom configuration</b>		
- with hand geared- and pneumatic trolley	Type 29/06	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Pneumatic Winch</b>	Type 43/86P	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Pneumatic Winch</b>	Type 42/87P	II 2G IIB c T4 / II 2D c 135°C
<b>HADEF Electric Chain Hoists</b>		
- with push travel-/ hand geared-/ and electric trolley	Type 90/09EX	II 2G IIB T4 / II 2D IIB 135°C
<b>HADEF Electric Chain Hoists combined with Trolleys – ultralow headroom configuration</b>		
- with hand geared- and electric trolley	Type 91/09EX	II 2G IIB T4 / II 2D IIB 135°C
<b>HADEF Electric Winch</b>	Type 43/86E	II 2G IIB T4 / II 2D IIB 135°C
<b>HADEF Electric Winch</b>	Type 42/87E	II 2G IIB T4 / II 2D IIB 135°C



### ATTENTION!



HADEF hoists may **not** be used in:  
 Zone 0 and 20, and Zone 1; 2; 21 and 22 with IIC Gas or IIB Gas  
 Hydrogen Sulphide and Ethylene Oxide as well as light metal dust and  
 impact-sensitive dust.

## EX-Classification

The EX-classification of the hoist, according to the specifications of the owner/user, is mentioned on a special EX-Type plate.

Hoists in explosion-proof configuration must only be used for the mentioned classification or lower classification.

### Example of an ATEX classification:



CE	CE-marking		European Union
Ex	explosion-proof equipment		
II	equipment class / kind of use	I II	mines with hazard of fire damp other areas with hazard of explosion
2	equipment category	1 2 3	use in zone 0 use in zone 1 use in zone 2
G	EX-atmosphere	G D	...caused by gas, vapour, mist ...caused by dust
IIB	explosion class	IIA IIB IIC	max. experimental safe gap (MESG) > 0,9 mm max. experimental safe gap (MESG) 0,9 - >= 0,5 mm max. experimental safe gap (MESG) > 0,5 mm
c	type of protection	c k	safety factor liquid cladding
T4	temperature for gas (for dust only the temperature is indicated in °C)	T1 T2 T3 T4 T5 T6	limit temperature 450°C limit temperature 300°C limit temperature 200°C limit temperature 135°C limit temperature 100°C limit temperature 85°C



Foto: Øyvind Hagen