

Marking of non-electrical equipment for use in potentially explosive atmospheres

Conditions and subdivisions				
Conditions and subdivisions			Required marking on the usable operating equipment	
Flammable materials	Temporary behaviour of explosive atmosphere	Classification of hazardous areas	Group as defined in directive 94/9/EC	Equipment category as defined in directive 94/9/EC
gases vapours	is present continuously or for long periods or frequently	zone 0	II	1G
	arises in normal operation occasionally	zone 1	II	2G or 1G
	is not likely to arise in normal operation, or if it does, will persist for a short time only	zone 2	II	3G or 2G or 1G
dusts	is present in the form of a cloud continuously, or for long periods or frequently	zone 20	II	1D
	occasionally develops into a cloud during normal operation	zone 21	II	2D or 1D
	is not likely to develop into a cloud during normal operation, or if it does, for a short time only	zone 22	II	3D or 2D or 1D
methane carbon dust	Operation during risk of explosion industry	Mining industry	I	M1
	Activation during risk of explosion	Mining industry	I	M2 or M1

Subdivisions of gases and vapours						
Gases and vapours			Assignment of gases and vapours according to the ignition temperature	Temperature class	Maximum surface temperature of equipment	Permissible temperature classes of equipment
ammonia, methane, ethane, propane	town gas, acrylnitril	hydrogen	> 450 °C	T1	450 °C	T1 to T6
ethyl alcohol, cyclohexane, n-butane	ethylene, ethylene oxide	ethine (acetylene)	> 300 °C ... ≤ 450 °C	T2	300 °C	T2 to T6
gasoline, n-hexane	ethylene glycol, hydrogen sulphide		> 200 °C ... ≤ 300 °C	T3	200 °C	T3 to T6
acetaldehyde	ethyl-ether		> 135 °C ... ≤ 200 °C	T4	135 °C	T4 to T6
			> 100 °C ... ≤ 135 °C	T5	100 °C	T5 to T6
		sulphide of carbon	> 85 °C ... ≤ 100 °C	T6	85 °C	T6

Use of the operating equipment	
Conditions	Marking
operating equipment can be used without restriction	without
special conditions of use	X
operating equipment with partial certificate, CE conformity is certified when it is installed into a complete item of operating apparatus	U

Explosion groups		
IIA	IIB	IIC
Permissible equipment groups		
IIA, IIB, IIC	IIB, IIC	IIC

CE 0044* Ex II 1G c IIB T4 NB 04 ATEX 1234* X

Official notified bodies		
Code number	Notified bodies	Country
0589	BAM	Germany
0158	DEKRA EXAM	Germany
0600	EECS (BASEEFA)	UK
0637	IBExU	Germany
0344	KEMA	Netherlands
0081	LCIE	France
0102	PTB	Germany
0518	SIRA	UK
0044	TÜV (NORD CERT)	Germany

Protection principle/types of protection						
Applications	Protection principle	Application	Symbol	Marking code	Device category	Norm
All Applications	-	General requirement		-	-	DIN EN 13463-1
Brakes	Prevents outward transmission of the explosion	Flow-restricting enclosure		d	2	DIN EN 13463-3
Coupling, belt drive, agitator, fan, mill	Prevents outward transmission of the explosion	Flameproof enclosure		c	2	DIN EN 13463-5
Plain bearing, pump, agitator, vacuum pump	Prevents sparks and hot surfaces	Protection by constructional safety		b	2	DIN EN 13463-6
Complex machine	Ex atmosphere is kept at a distance from the source of ignition	Pressurized enclosure		p	2	DIN EN 13463-7
Complex machine	Ex atmosphere is kept at a distance from the source of ignition	Flow-restricting enclosure		fr	3	DIN EN 13463-2
Gear	Ex atmosphere is kept at a distance from the source of ignition	Liquid immersion		k	2	DIN EN 13463-8

— Marking according directive 94/9/EC
 — according norm EN 13463-1 ff
 * applies only to category 1 devices

