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

	Conditions and subdivisions							Subdivisions of gases and vapours						
Conditions and s			Required marking	ng on the usable op	erating equipment		Gases and vapo			Assignment	Temperature	Maximum	Permissible	
Flammable naterials	Temporary behaviour of explosive atmosphere	Classification of hazardous areas	Group as defined in directive	Equipment category as defined in directiv		Equipment protection level (EPL) as defined in				of gases and vapours accordance to the ignition temperature		surface temperature of equipment	temperature classes of equipment	
ases apours	is present continuously or for long periods or frequently	zone 0	2014/34/EU	2014/34/EU 1G	EN ISO 80079-36	EN ISO 80079-36 Ga	ammonia, methane, ethane, propane	town gas, acrylnitril	hydrogen	> 450 °C	T1	450 °C	T1 to T6	
	arises in normal operation occasionally	zone 1	II	2G or 1G	II	Gb or Ga	ethyl alcohol, cyclohexane, n-butane	ethylene, ethylene oxide	ethine (acetylene)	> 300 °C ≤ 450 °C	T2	300 °C	T2 to T6	
	is not likely toarise in normal operation, or if it does, will persist for a short time only	zone 2		3G or 2G or 1G	II	Gc or Gb or Ga	gasoline, n-hexane	ethylene glycol, hydrogen sulphide		> 200 °C ≤ 300 °C	Т3	200 °C	T3 to T6	
lusts	is present in the form of a cloud continuously, or for long periods or frequently	zone 20	II	1D	III	Da	acetaldehyde	ethyl-ether		> 135 °C ≤ 200 °C > 100 °C ≤ 135 °C	T4 T5	135 °C 100 °C	T4 to T6 T5 to T6	
	occasionally develops into a cloud during normal operation	zone 21	II	2D or 1D	III	Db or Da			sulphide of carbon	> 85 °C ≤ 100 °C	T6	85 °C	T6	
	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 or1D	III	Dc or Db or Da	Explosion group	os .						
methane carbon dust	operation where there is a risk of explosion disconnection where there	-	1	M1 M2 or M1	1	Ma Mb or Ma	IIA Permissible equ	IIB	IIC					
	is a risk of explosion	-	'	M2 OF WIT	'	MID OF Ma	IIA, IIB, IIC	IIB, IIC	IIC					
		(C)				- 10 la	ШП		T A	Ch			7	
Gas	C € NB	* (Ex)	26	C	EX N	IIB		T4	Gb	NB* 16	ATEX 12	234	
			_				_	_						
Dust	C € NB	\times \times		2D	C	Ex h	IIIB	T1	10°	C Db	NB* 16	ATEX 12	234	
Protection pri Applications	inciple/types of protection Flammable ma			Protection principle Type of protection		Symbol		3		Norms	Use of the operating equipment Marking Conditions			
all applications	gases, vapours (i	G) and dusts (D)		gener	al requirements	_	very high level of	high level of pro-	enhanced level of protection	EN 13463-1	rest	erating equipment can b triction	e used without	
an approaciono	guoto, vapouro (ay and data (b)		gonor	ar roquiromonto		·			EN ISO 80079-36 EN 60079-0	U ope CE-	ecial conditions of use erating equipment with p -conformity is certified v	when it is installed	
Coupling, belt drive agitator, ventilator,			This protection princip that a source of ignitio occur.		ructional safety	×	С		c Ex h	EN 13463-5	into	a complete item of ope	erating apparatus	
Plain bearing, pum	np, agitator, gases, vapours (0) 11 1 (D)	-				Ex h	Ex h	EX II	EN ISO 80079-37				
			This protection princip a source of ignition fro		ol of ignition sources	· C	b	b	b	EN 13463-6	permissible tempe	perature of dust $T_{adm.C} =$	T _{5 mm C} - 75 K	
vacuum pump	gases, vapours (G) and dusts (D)	a source of ignition fro effective. This protection princip	m becoming le prevents Liquic	ol of ignition sources	The Control of the Co	b Ex h	b				erature of $T_{adm. C} =$	$= T_{5 \text{ mm c}} - 75 \text{ K}$ $_{10} = 2/3 T_{\text{nuage}}$	
vacuum pump Gear		G) and dusts (D)	a source of ignition fro effective. This protection princip the hazardous atmosp the source of ignition.	le prevents Liquic here reaching	immersion		b Ex h k Ex h	b Ex h k Ex h	b Ex h	EN 13463-6 EN ISO 80079-37 EN 13463-8 EN ISO 80079-37	permissible temper the layer	erature of $T_{adm. c} =$ erature of $T_{adm. nuage}$ e surface $T_{adm. nuage}$		
vacuum pump Gear Centrifuge, compre geared motor,	essor, gases, vapours (G) and dusts (D) G) and dusts (D)	a source of ignition fro effective. This protection princip the hazardous atmospi	le prevents here reaching le prevents Press			b Ex h k Ex h	b Ex h k Ex h p Ex pxb, pyb	b Ex h k Ex h - Ex pzc	EN 13463-6 EN ISO 80079-37 EN 13463-8	permissible temper the layer permissible temper the cloud max. permissible temperature of the cloud temperature of the cl	erature of $T_{adm. c} =$ erature of $T_{adm. nuage}$ e surface $T_{adm. nuage}$	_{ne} = 2/3 T _{nuage}	
	group group gases, vapours (group gases and vapou	G) and dusts (D) G) and dusts (D) ars (G)	a source of ignition fro effective. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the hazardous atmosp	le prevents here reaching le prevents here reaching le prevents here reaching le prevents Press	immersion urised enclosure		b Ex h k Ex h	b Ex h k Ex h p Ex pxb, pyb	b Ex h k Ex h	EN 13463-6 EN ISO 80079-37 EN 13463-8 EN ISO 80079-37 EN 13463-7	permissible temper the layer permissible temper the cloud max. permissible temperature of the cloud temperature of the cl	erature of $T_{adm. C} = T_{adm. C}$ erature of $T_{adm. nuage}$ e surface $T_{adm. C} \ge T_{adm. C}$ st	$T_{pe} = 2/3 T_{nuage}$ $T_{adm.} \leq T_{adm. nuage}$ Permissible	
Vacuum pump Gear Centrifuge, compre geared motor, complex assembly Centrifuge, compre geared motor, complex assembly Centrifuge, compre geared motor, complex assembly	group group group group gases and vapou group dusts (D)	G) and dusts (D) G) and dusts (D) ars (G)	a source of ignition fro effective. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition.	le prevents here reaching le prevents enclose le prevents Protections	immersion urised enclosure		b	b Ex h k Ex h p Ex pxb, pyb	b Ex h k Ex h - Ex pzc	EN 13463-6 EN ISO 80079-37 EN 13463-8 EN ISO 80079-37 EN 13463-7 EN 60079-22	permissible temper the layer permissible temper the cloud max. permissible temperature of the equipment Groups of dust Marking Dust IIIA con	erature of $T_{adm. C} = T_{adm. C} = T_{adm. nuage}$ erature of $T_{adm. nuage} = T_{adm. C} $	Permissible equipment group	
Gear Centrifuge, compregeared motor, complex assembly Centrifuge, compregeared motor, complex assembly Centrifuge, compregeared motor, complex assembly	group group group group gases and vapou group dusts (D)	G) and dusts (D) G) and dusts (D) ars (G)	a source of ignition fro effective. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition. This protection princip the hazardous atmosp the source of ignition.	le prevents here reaching	immersion urised enclosure etion by flow restricting sure		b Ex h k Ex h Ex ta	b Ex h k Ex h p Ex pxb, pyb — Ex tb	b Ex h k Ex h - Ex pzc Ex fr	EN 13463-6 EN ISO 80079-37 EN 13463-8 EN ISO 80079-37 EN 13463-7 EN 60079-2 ²⁾ EN 13463-2 EN 60079-31 ²⁾ EN 13463-3	permissible temper the layer permissible temper the cloud max. permissible temperature of the equipment Groups of dust Marking IIIA LIIIA LIIIB Dust	erature of $T_{adm. C} = T_{adm. C}$ erature of $T_{adm. nuage}$ estrature $T_{adm. C} \ge T_{adm. C}$ estrature of $T_{adm. C} \ge T_{adm. C}$ estrature of $T_{adm. C} \ge T_{adm. C}$ estrature of $T_{adm. C} \ge T_{adm. C}$ enductive flyings $T_{adm. C} \ge T_{adm. C}$	p _e = 2/3 T _{nuage} ≥ T _{adm.} ≤ T _{adm. nuage} Permissible equipment group	
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