


for explosion hazardous environment

With HAFNER you have a partner with many years of experience in the field of explosion-proof products. Benefit from our extensive product range and numerous special solutions. With our selection guide for solenoid valves, you can quickly and easily find the right HAFNER Ex-valve for your application.

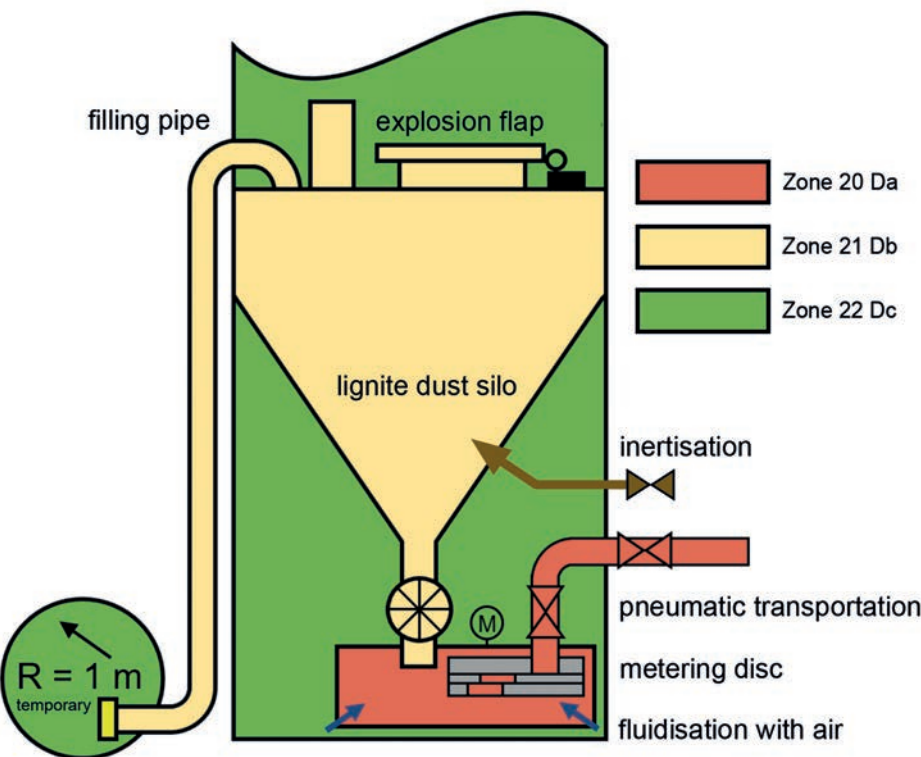
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Example marking of an Ex-product

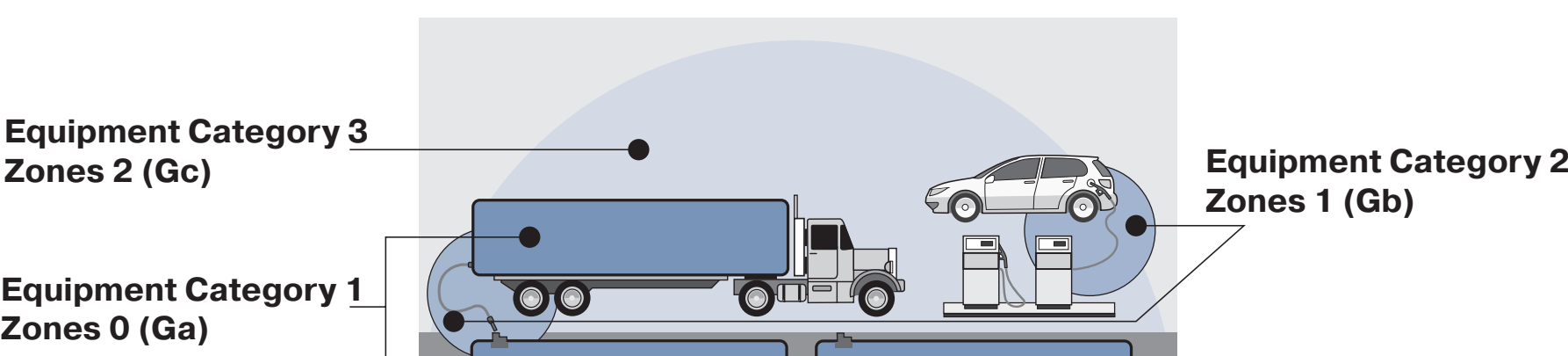
CE  II		2G / 2D		Ex m		IIC / IIIC		T6		Gb / Db									
Product group		Category / Zones		Ignition protection			Explosion group		Temperature class			Protection Level							
Group		Category	Zone		Type	HAFNER Typnr.	Product Labeling	Dust		Class	Temperature range of the mix	Max. surface temperature	Zone						
I	Products for mining applications. Not part of HAFNER product range.	1	Very high level of protection and very high level of safety. Not part of HAFNER product range.	0 (Ga) 20 (Da)	Increased safety			e	ec	ec	III C: Conductive dust IIIB: Non-conductive dust IIIA: Combustible lint	↑	T1	> 450°C	450°C	Ga, Gb and Gc for gases			
					Intrinsically safe			i	ia	ia*									
					Encapsulation			m	m	mb									
II	All other products for explosion hazardous environment.	2	High level of protection and therefore a high level of safety.	1 (Gb) 21 (Db)	Increased safety / Encapsulation			e m	e mb	e mb	Typical gas	↑	T2	≥ 300 - 450°C	300°C	Da, Db and Dc for dusts			
					Encapsulation / Flameproof			d m	dm	db mb									
		3	Normal level of protection and therefore increased level of safety.	2 (Gc) 22 (Dc)	Flameproof			d	d	db	IIC: Hydrogen IIB: Ethylene IIA: Propane	↑	T3	≥ 200 - 300°C	200°C		Equipment Protection Level (EPL) according to IEC 60079. Specification similar to zones according to 2014/34/ EU (ATEX).		
					Protection by housing (only dust)			t		tb									
		Measured [hours/year] in which there is a risk of explosion.	Constructional safety (non-electrical devices)			h (valve body)		h	Gases and dust-gas mixtures have different ignition capabilities. These are differentiated groups IIA, IIB and IIC, according to IEC 60079-1A and IEC 60079-3. The danger increases from group A to C.	↑	T4	≥ 135 - 200°C	135°C	Flammable gases and vapours are classified into temperature classes according to their inflammability. The maximum surface temperature of electrical equipment must always be lower than the ignition temperature of the gas/air or vapour/air mixture in which it is used.					
			These are exemplary ignition protection types in pneumatics.								T5	≥ 100 - 135°C	100°C						
Equipment categories according to EU Directive 2014/34/EU (ATEX): • Zones 0, 1 and 2 for gases • Zones 20, 21 and 22 for dusts			The letter after the ignition protection type indicates in which zone the product can be used. a = zone 0, 20, 1, 21, 2, 22 b = zone 1, 21, 2, 22 c = zone 2, 22 Example: „ec“ = limited to zone 2 and 22.			* Please note that the electrical interface of the HAFNER Ex ia 1.6 watts coil is designed for „Ia“, but is restricted by the manufacturer to zone 1, 2, 21 and 22.			Consequently, products classified IIC/IIIC can also be used in IIB/IIIB and IIA/IIIA.			Equipment of a higher temperature class (e.g. T6) can therefore also be used for lower temperature classes (T1-T5).			„Ta“ on non-electric valves stand for „ambient temperature“ and indicate the temperatur the valve can be used in (for example -10 °C≤Ta≤+50 °C).				

Stands for special conditions

Example dust atmosphere



Example gas atmosphere












The marking of electrical and non-electrical equipment has the same structure. A distinction is only made in the type of ignition protection.

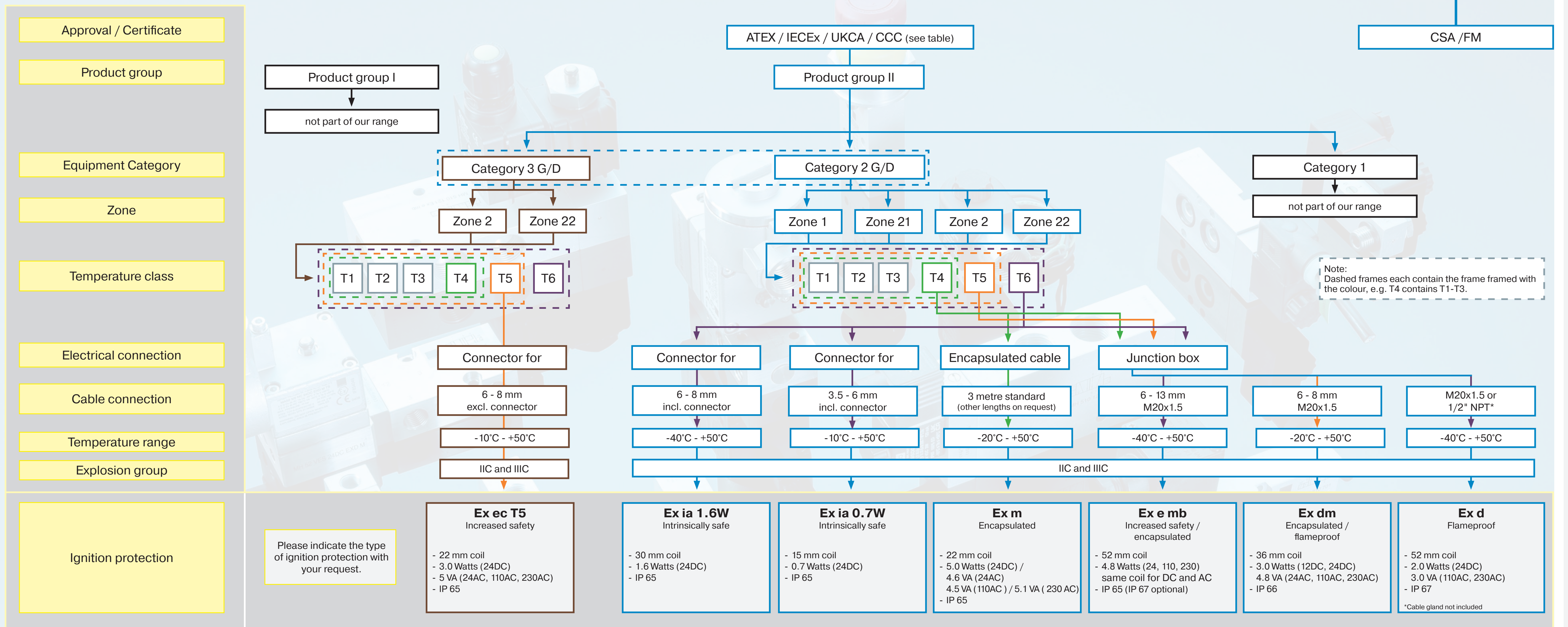
Many HAFNER valves are available with SIL3 certificate, for low temperature and in stainless steel.



Overview of the HAFNER Ex-range

	Non-electric Valves		Electric Valves (Solenoid Valves)													
	Ignition protection															
	h	Ex ec	Ex ia 1.6W	Ex ia 0.7W	Ex m	Ex e mb	Ex dm	Ex d	Ex m CSA/FM							
	Constructional safety	Increased safety	Intrinsically safe	Intrinsically safe	Encapsulation	Increased safety / encapsulation	Encapsulation / flameproof	Flameproof	Encapsulation							
																
Approval / Certificate	ATEX	✓	✓	✓	✓	✓	✓	✓	-							
	IECEX	-	-	✓	✓	✓	-	✓	-							
	CSA/FM	-	-	-	-	-	-	-	✓							
	UKCA	-	✓	-	-	-	-	-	-							
	CCC	-	-	on request	-	on request	-	-	on request	-						
Zone	1 (Gb)	- ✓	-	✓	✓	✓	✓	✓	<small>Specifications in accordance to CSA certificate: Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G, Class III, Class I, Division 2, Groups A, B, C, D; Specifications in accordance to FM certificate: Explosion-proof Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C; encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C; dust-ignition-proof for Class I/II, Division 1, Groups E, F and G, T4, Ta = 60 °C; Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C; Suitable for Class II, Division 2, Groups E, F, G, T4, Ta = 60 °C. The current standards can be found in the certificates.</small>							
	21 (Db)	- ✓	-	✓	✓	✓	✓	✓								
	2 (Gb)	✓ ✓	✓	✓	✓	✓	✓	✓								
	22 (Dc)	✓ ✓	✓	✓	✓	✓	✓	✓								
	Category	3G/D 2G/D	3G/D	2G/D	2G/D	2G/D	2G/D	2G/D		2G/D						
Temperature class	T6 (includes T1-T5)		T5 (includes T1-T4)		T6 (includes T1-T5)		T4 (includes T1-T3)		T6 (includes T1-T5)		T5 (includes T1-T4)		T6 (includes T1-T5)		T4 (includes T1-T3)	
Explosion group	IIIC and IIIC		IIIC and IIIC		IIIC and IIIC		IIIC and IIIC		IIIC and IIIC		IIIC and IIIC		IIIC and IIIC		IIIC and IIIC	
Product Group	II (not included)		II (not included)		II (not included)		II (not included)		II (not included)		II (not included)		II (not included)		II (not included)	
Temperature ranges	-50 °C - +50 °C (higher on request)		-10 °C - +50 °C		-40 °C - +50 °C		-10 °C - +50 °C		-20 °C - +50 °C		-40 °C - +50 °C		-20 °C - +50 °C		-40 °C - +50 °C	
Electrical connection	-		Plug for 6 - 8 mm cable excl. connector		Plug for 6 - 8 mm cable incl. connector		Plug for 3.5 - 6 mm cable incl. connector		Encapsulated cable 3 metre standard (other lengths on request)		Junction box M20x1.5 Plug for 6 - 13 mm		Junction box M20x1.5 Plug for 6 - 8 mm		Junction box M20x1.5 or 1/2" NPT Cable gland not included	
IP protection class	-		IP 65		IP 65		IP 65		IP 65		IP 65 (IP 67 optional)		IP 66		IP 67	
Power consumption	-		3.0 Watts (24DC) 5 VA (24AC, 110AC, 230AC)		1.6 Watts (24DC)		0.7 Watts (24DC)		4.6 VA (24AC) / 4.5 VA (110AC) 5.1 VA (230 AC)		4.8 Watts (12DC, 24DC) 4.8 VA (24AC, 110AC, 230AC) same coil for DC and AC		3.0 Watts (12DC, 24DC) 4.8 VA (24AC, 110AC, 230AC)		2.0 Watts (24DC) 3.0 VA (110AC, 230AC)	

Selection guide - Find your HAFNER Ex-system



Errors and omissions excepted