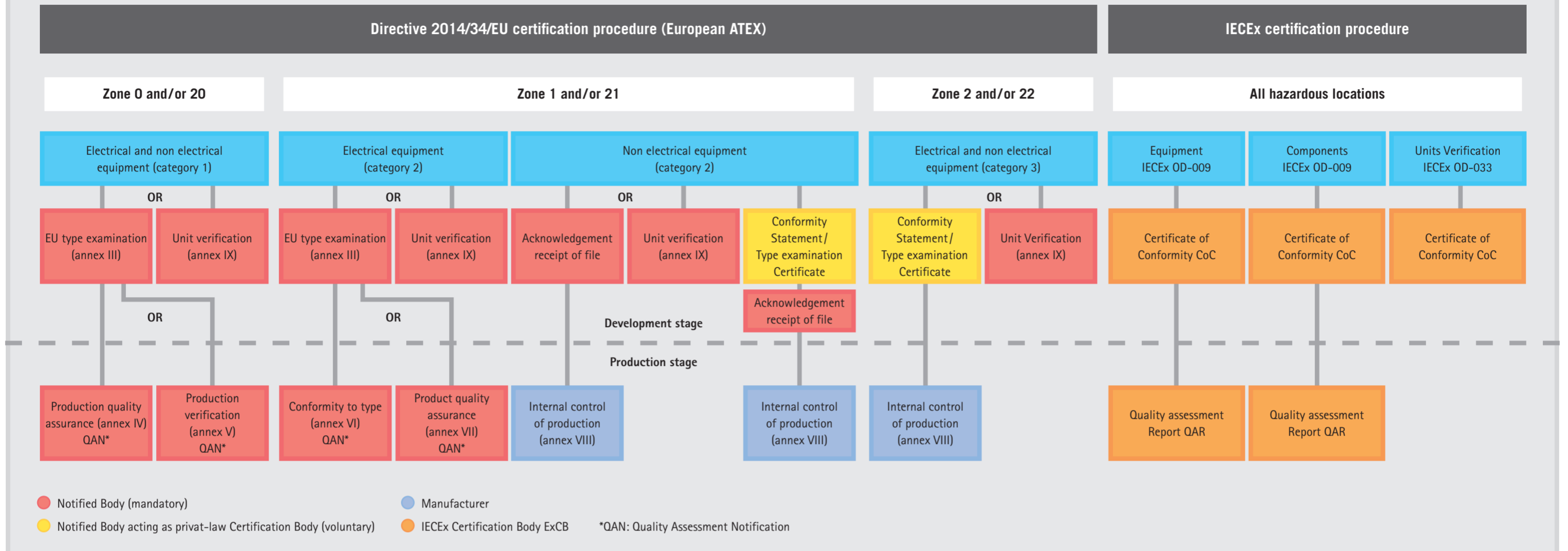


Certification Procedure



Equipment Categories + Groups, Protection Level, Zones, Security Level

Zone		Atmosphere	Security level	Equipment group ATEX	Equipment categories (ATEX)		Equipment group IECEx		EPL level IECEx	
Gas	Dust			Gas/Dust	Gas	Dust	Gas	Dust	Gas	Dust
0	20	always, long term, often, as cloud	during rare malfunctions	II	1G	1D	II	III	Ga	Da
1	21	on occasion in normal operation; as cloud	during expected malfunctions	II	2G, 1G	2D, 1D	II	III	Gb	Db
2	22	none or short-term in normal operation	in normal operation	II	3G, 2G, 1G	3D, 2D, 1D	II	III	Gc	Dc
Mining			during rare malfunctions	I	M1		I		Ma	
			until de-energizing of the equipment	I	M2		I		Mb	

Marking (Examples)

Electrical equipment (ATEX)

Gas	CE	NB ¹⁾	Ex	II	2G	Ex db	IIB	T4	Gb
Dust	CE	NB ¹⁾	Ex	II	2D	Ex tb	IIB	T 120° C	Db

1) NB = Notified Body Number, see below

Non electrical equipment (ATEX)

Gas	CE	NB ¹⁾	Ex	II	2G	Ex h	IIB	T4	Gb
Dust	CE	NB ¹⁾	Ex	II	2D	Ex h	IIB	T 110° C	Db

1) NB = Notified Body Number, see below

IECEx

Gas	Ex db	IIB	T4	Gb
Dust	Ex tb	IIB	T 120° C	Db

Applicable Standards

Protection Principle	Gas			Dust			Mining	Standard
Zones	0	1	2	20	21	22		IEC/EN 60079-10-1
Equipment Protection Level EPL	Ga	Gb	Gc	Da	Db	Dc	Ma/Mb	
Electrical Equipment								
General requirements	•	•	•	•	•	•	•	IEC/EN 60079-0
Flameproof enclosures	da	db	dc	•	•	•	• / •	IEC/EN 60079-1
Pressurised enclosures		pxb pyb	pzc		pxb pyb	pzc	- / •	IEC/EN 60079-2
Powder filled		q	q				- / •	IEC/EN 60079-5
Liquid immersion		o	o				- / •	IEC/EN 60079-6
Increased safety		eb	ec				- / •	IEC/EN 60079-7
Intrinsically safe	ia	ib	ic	ia	ib	ic	• / •	IEC/EN 60079-11
Pressurised rooms		pb	pc vc		pb	pc vc		IEC/EN 60079-13
Non-sparking equipment, Restricted breathing, Enclosed sparking equipment			nA nR nC					IEC/EN 60079-15
Encapsulation	ma	mb	mc	ma	mb	mc	• / •	IEC/EN 60079-18
Intrinsically safe systems	ia	ib	ic	ia	ib	ic	• / •	IEC/EN 60079-25
Equipment protection level EPL Ga or Two independent types of protection EPL "Gb"	_a _b+_b							IEC/EN 60079-26
Protection against optical radiation	op is	op is op sh op pr	op is op sh op pr				• / •	IEC/EN 60079-28
Enclosures				ta	tb	tc		IEC/EN 60079-31
Caplight for use in mines							•	IEC/EN 60079-35-1
Equipment assemblies	•	•	•	•	•	•		IEC/TS 60079-46
Non electrical Equipment								
Flameproof enclosures		•	•	•	•	•	• / •	ISO/EN 60079-1
Pressurised enclosures		•	•				- / •	ISO/EN 60079-2
Enclosures				•	•	•		ISO/EN 60079-31
General requirements	h	h	h	h	h	h	•	ISO/EN 80079-36
Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"	•	•	•	•	•	•	• / •	ISO/EN 80079-37
Equipment and components in underground mines							•	EN ISO/IEC 80079-38

• = Standard Applicable

Mining
I Methane, coal dust

Gas Groups (typical)
IIA Butane, Propane
IIB Ethylene
IIC Acetylene, Hydrogen

Dust Groups
IIIA Flying combustible
IIIB Non conductive dust
IIIC Conductive dust

Gas Temperature class
T Max. Surface Temperature
T6 85° C
T5 100° C
T4 135° C
T3 200° C
T2 300° C
T1 450° C

Ingress Protection of Enclosures

Protection against solids, 1st digit

IP	Tests
0	No protection
1	Protection against solid foreign objects (Ø ≥ 50 mm)
2	Protection against solid foreign objects (Ø ≥ 12.5 mm)
3	Protection against solid foreign objects (Ø ≥ 2.5 mm)
4	Protection against solid foreign objects (Ø ≥ 1.0 mm)
5	Dust protected, no harmful deposit
6	Dust tight, no ingress of dust

Protection against liquids, 2nd digit

IP	Tests
0	No protection
1	Protection against vertically falling drops
2	Protection against drops falling up to 15° from vertical
3	Protection against splashing water falling up to 60° from vertical
4	Protection against splashing water from any direction
5	Protection against water jets
6	Protection against powerful water jets
7	Protection against temporary immersion in water
8	Protection against continuous immersion in water
9	Protection against high pressure and temperature water jets