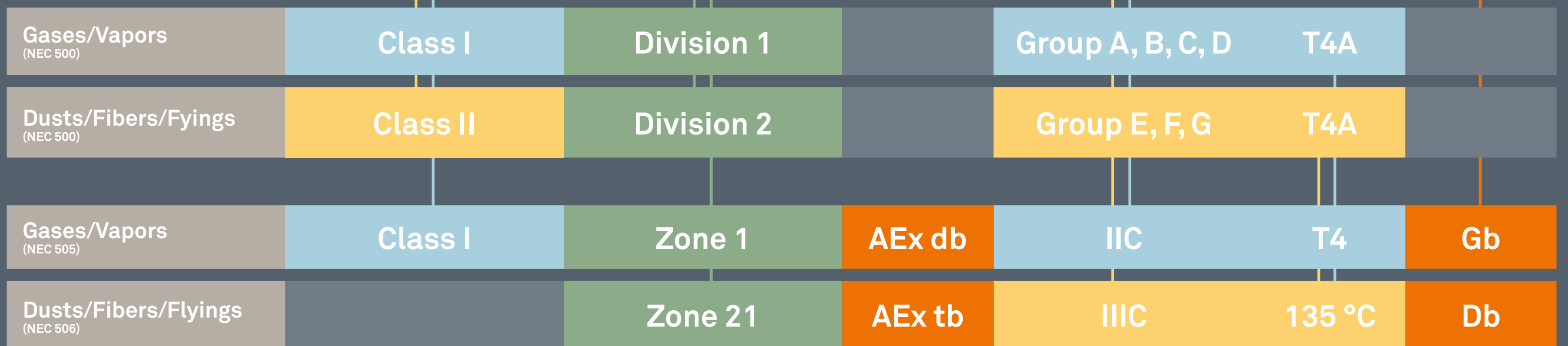


Classification of location, flammable material NEC 505, 506				NEC 500			Classification of location NEC 500				NEC 505, 506	
Flammable material	Flammable material (examples)	Group and Sub-Group	Required marking (equipment)	Class	Group	Required marking (equipment)	Flammable material	Temporary behaviour of explosive atmosphere	Classification of hazardous area	Required marking (equipment)	Classification of hazardous area	Equipment protection level (EPL)
Gases, vapors	Acetylene	IIC	IIC	Class I	Group A	Class I, Group A	Gases, vapors, dust, fibers or flyings	... continuously or for long periods of time (continuous hazard)	Division 1	Division 1	Zone 0 (Gases, vapors)	Ga
	Hydrogen	IIC	IIC		Group B	Class I, Group B						
	Ethylene, acrylonitrile, propylene oxide, ethyl oxide	IIB	IIB, IIC		Group B	Class I, Group B						
	Cyclopropane, ethyl ether	IIB	IIB, IIC		Group C	Class I, Group C						
	Acetone, methane, hexane, propane	IIA	IIA, IIB, IIC		Group D	Class I, Group D						
Dust, fibers, flyings	Conductive dust, metal dust	IIIC	IIIC	Class II	Group E	Class II, Group E	Gases, vapors, dust, fibers or flyings	... likely to occur in normal operation (intermittent hazard)	Division 1	Division 1	Zone 1 (Gases, vapors)	Gb, Ga
	Coal dust	IIIC	IIIC		Group F	Class II, Group F						
	Non-conductive dust, grain dust	IIIB	IIIC, IIIB		Group G	Class II, Group G						
	Combustible flyings, paper or cotton processing	IIIA	IIIC, IIIB, IIIA		Class III	Class III						
Gases, vapors, dust, fibers or flyings				Class II			Gases, vapors, dust, fibers or flyings	... not likely to occur in normal operation and if, only infrequently and for a short period (hazard under abnormal conditions)	Division 2	Division 1 or Division 2	Zone 2 (Gases, vapors)	Gc, Gb, Ga
					Class III							

Marking examples



Protection principles and types of protection								
Applications	Flammable materials	Protection principle	Type of protection	Standards under NEC 500 Divisions	Standards under NEC 505, 506	Marking in accordance with the equipment protection level		
						very high level of protection	high level of protection	enhanced level of protection
All equipments	Gases, vapors, dust, fibers, flyings	-	General requirements	FM 3600	ANSI/UL-60079-0	-	-	-
Control stations, motors, fuses, switchgear, power electronics	Gases, vapors	Propagation of an explosion inside to the outside is excluded	Flameproof Explosionproof	UL 1203 (Div. 1+2) FM 3615	ANSI/UL-60079-1	Ex da	Ex db	Ex dc
Junction and connection boxes, enclosures, motors, lights, terminals	Gases, vapors	Avoidance of arcs, sparks and excessive temperature	Increased safety	-	ANSI/UL-60079-7	-	Ex eb	Ex ec
Junction and connection boxes, enclosures, motors, luminaires, switch and control cabinets, plugs	Dust, fibers, flyings	Explosive atmosphere kept at distance from the ignition source	Protection by enclosure	UL 1203 (Div. 1+2)	ANSI/UL-60079-31	Ex ta	Ex tb	Ex tc
			Ignition proof	FM 3616 (Class II, Div. 1) FM 3611 (Class III, Div. 1+2)	-	-	-	-
Measurement and control technology, automation technology, sensors, actuators	Gases, vapors, dust, fibers, flyings	Limitation of energy of arcs and temperature	Intrinsic safety	UL 913 (Div. 1+2) FM 3610 NEC 504 (Systems)	ANSI/UL-60079-11 ANSI/UL-60079-25	Ex ia	Ex ib	Ex ic
Switch and control stations, motors, analyzers, computers	Gases, vapors, dust, fibers, flyings	Explosive atmosphere kept at distance from the ignition source	Pressurized	NFPA 496 (Div. 1+2) FM 3620 FM 12.4	ANSI/UL-60079-2	-	Ex pxb Ex pyb	Ex pzc
Coils of motors or relays, solenoid valves, connection systems	Gases, vapors, dust, fibers, flyings	Explosive atmosphere kept at distance from the ignition source	Encapsulation	-	ANSI/UL-60079-18	Ex ma	Ex mb	Ex mc
Transformers, relays, control stations, magnetic contactors	Gases, vapors	Explosive atmosphere kept at distance from the ignition source	Oil immersion	UL 698	ANSI/UL-60079-6	-	Ex o	-
Capacitors, transformers, relays	Gases, vapors	Propagation of an explosion inside to the outside is excluded	Powder filling	-	ANSI/UL-60079-5	-	Ex q	-
Applications for zone 2, division 2	Gases, vapors, dust, fibers, flyings	Protection principles adapted for zone 2	Non sparking Enclosed construction Limited energy Restricted breathing	UL 1604 UL 12.12.01 FM 3611	UL 60079-15	-	-	Ex nA Ex nC Ex nL Ex nR

Temperature (Gases or vapors)			
Temperature code NEC 500	Temperature class NEC 505	Maximum surface temperature (equipment)	Permissible temperature classes (equipment)
T1	T1	450 °C	T1 to T6
T2	T2	300 °C	T2 to T6
T2A	-	280 °C	T2A to T6
T2B	-	260 °C	T2B to T6
T2C	-	230 °C	T2C to T6
T2D	-	215 °C	T2D to T6
T3	T3	200 °C	T3 to T6
T3A	-	180 °C	T3A to T6
T3B	-	165 °C	T3B to T6
T3C	-	160 °C	T3C to T6
T4	T4	135 °C	T4 to T6
T4A	-	120 °C	T4A to T6
T5	T5	100 °C	T5 to T6
T6	T6	85 °C	T6

Temperature (Dust, fibers or flyings)

For application (installation) the maximum permitted surface temperature of the equipment shall be determined by the lowest value of:

1. ignition temperature of the dust cloud and
2. ignition temperature of the dust layer

Both values shall be reduced by a safety factor.

For more information we refer to NEC 506