



شرکت فنی و مهندسی اصل فولاد

THE TABLE OF HAZARDOUS AREAS

ACCORDING TO ATEX DIRECTIVE

Zone	Category of Motors			Method of Protection				
	1G	2G	3G	Ex-d	Ex-de	Ex-e	Ex-p	Ex-nA
0	X							
1	X	X		Temperature class and Enclosure group	Temperature class and Enclosure group	Temperature class	Temperature class	
2	X	X	X	Temperature class and Enclosure group	Temperature class and Enclosure group	Temperature class	Temperature class	Temperature class

Zone	Category of Motors			Method of Protection	
	1D	2D	3D	tD-IP6x	tD-IP5x
20					
21		X		Temperature class	
22	Conductive dust	X		Temperature class	
	None Conductive dust	X	X	Temperature class	Temperature class

Temperature class and Enclosure group

Temperature class

Certificate by Notified Bodies mandatory

Temperature class

Temperature class

Declaration by Manufacture acceptable

Temperature class and Enclosure group for GAS atmospheres

Group	Temperature classes							
	T1		T2		T3	T4	T5	T6
I								
IIA	Acetic acid Acetone Ammonia Benzole Benzene Bulanone Carbon monoxide Ethane Ethyl acetate Ethyl chloride	Methane Methanol Methyl acetate Methyl alcohol Methyl chloride Naphthalene Propane Toluene Xylene	Acetic anhydride i amyl acetate n butane n butyl alcohol Amylic alcohol Butyl acetate Cyclohexanol Ethyl alcohol Iso butylic alcohol Liquefied gas	Natural gas Propyl acetate	Cyclohexane Cyclohexanol Decano Diesel fuels Casoline Heating oil Heptane Hexane Jet fuels Pentane	Petroleum*	Acetaldehyde Ether	
IIB	Coke-oven gas Water gas(carburetted)		1,3-Butadiene Ethylene	Ethylbenzene Ethylene oxide	Hydrogen sulphide Isoprene Petroleum*		Ethyl ether	
IIC	Hydrogen		Acetylene					Carbon disulphide Ethyl nitrate

*depending on composition

Temperature class

Temperature class	Maximum surface temperature Of electrical equipment Including 40°C ambience temperature	
	°C	°F
T1	450	842
T2	300	572
T3	200	392
T4	135	275
T5	100	212
T6	85	185

How to calculate temperature class for DUST

Dust ignition temperature	Airborne Tci	On surface T5mm
Safety temperature	Ts1 = 2/3 Tci	Ts2 = T5mm-75k
Maximum surface temperature	Tamm = the lowest between Ts1 And Ts2	
Motor temperature class ≤ Tamm		



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CMAA Class	FEM CLASS	Description	further explanation
Class A	FEM:1 CM ISO:M2	Standby or Infrequent Service	This class normally includes installation and maintenance cranes. This equipment usually operates at slow speeds for precise handling with long idle periods between lifts. Maximum capacity lifts are sometimes required.
Class B	FEM:1BM ISO:M3	Light Service	This class of crane is used in repair shops, light assembly operations, service buildings, light warehousing, etc. Service requirement is light and speeds are slow. Loads vary from none to occasional full capacity Lifts per hour would range from 2 to 5, and average 10 feet per lift.
Class C	FEM:1AM ISO:M4	Moderate Service	In terms of numbers, most cranes are built to meet Class C service requirements. This service covers cranes that may be used in machine shops or paper mill machine rooms. In this type of service, the crane will handle loads that average 50% of the rated capacity with 5 to 10 lifts per hour averaging 15 feet Not over 50% of the loads at rated capacity.
Class D	FEM:2M ISO:M5	HeavyService	This service covers cranes which may be used in heavy machine shops foundries, fabricating plants, steel warehouses, and container yards, lumber mills, etc. and standard duty bucket and magnet operations where heavy duty production is required. In this type of service, loads approaching 50 percent of the rated capacity will be handled constantly during the working period. High speeds are desirable for this type of service with 10 to 20 lifts per hour averaging 15 feet, not over 65 percent of the lifts at rated capacity.
Class E	FEM:3M ISO:M6	Sever Service	This type of service is reserved for top riding bridge and gantry type multiple girder electric overhead travelling cranes and requires a crane capable of handling loads approaching rated capacity throughout its life Applications may include magnet bucket magnet/bucket combination cranes for Scrap yards, cermet mills, lumber mills, fertilizer plants, container handling etc., with 20 or more lifts per hour at or near the rated capacity.
Class F	FEM:4M ISO:M7	Continues Sever Service	This type of service is reserved for top riding bridge and gantry type multiple girder electric overhead travelling cranes and requires a crane capable of handling loads approaching rated capacity throughout its life Applications may include custom designed specialty cranes essential to performing the critical work tasks affecting the total production facility These cranes must provide the highest reliability, with special attention to ease of maintenance features.