

Dust ignition protection / Protection by enclosures “t” in explosive atmospheres

Combustible dust is hazardous as it can form potentially explosive atmospheres when dispersed in air. Furthermore, layers of combustible dust may ignite and act as an ignition source for an explosive atmosphere. Explosive atmospheres with dust can be found in a variety of industries such as agriculture, chemicals, plastics, food and beverage.

Selection and installation of electrical equipment

To ensure equipment can be safely used in explosive atmospheres with dust, it is vital that the following issues are taken into account when selecting product:

1. Type of dust:

- Will a cloud of dust be present around the product or
- will a layer of dust build up on the product and if so, what will be the maximum thickness of the layer between two cleaning/maintenance procedures.

2. Characteristics of the dust:

- Is the dust electrically conductive or non-conductive?

3. Ignition temperature of the dust:

- T_{cl} : Ignition temperature of dust in a “cloud” or
- T_{5mm} : Ignition temperature of a 5 mm dust layer

Selection and installation of the product according to IEC/EN60079 part 14: Electrical installations design, selection and erection. Please see the tables on the pages 12 and 13. Please see the table on page 14.

This protection prevents any explosion of dust because:

- The ingress of dust into the motor is prevented by the IP protection, being either IP 55 (“dust protected”) or IP 65 (“dust tight”).
- The maximum surface temperature outside the motor must not exceed the temperature class for which the motor is certified.
- No sparks must occur outside the motor enclosure.

Certification: Ex tb IIIB/C T...°C Db (for zone 21) motors are certified according to ATEX with an EC type examination certificate and according to the IEC Ex System. Ex tc IIIB/C T...°C Dc (for zone 22) motors are certified according to ATEX with a “voluntary type examination certificate” and according to the IEC Ex System.

The standard surface temperature class on dust ignition protection motors from ABB is T125 °C, other temperature classes are available on request.

Dust classification

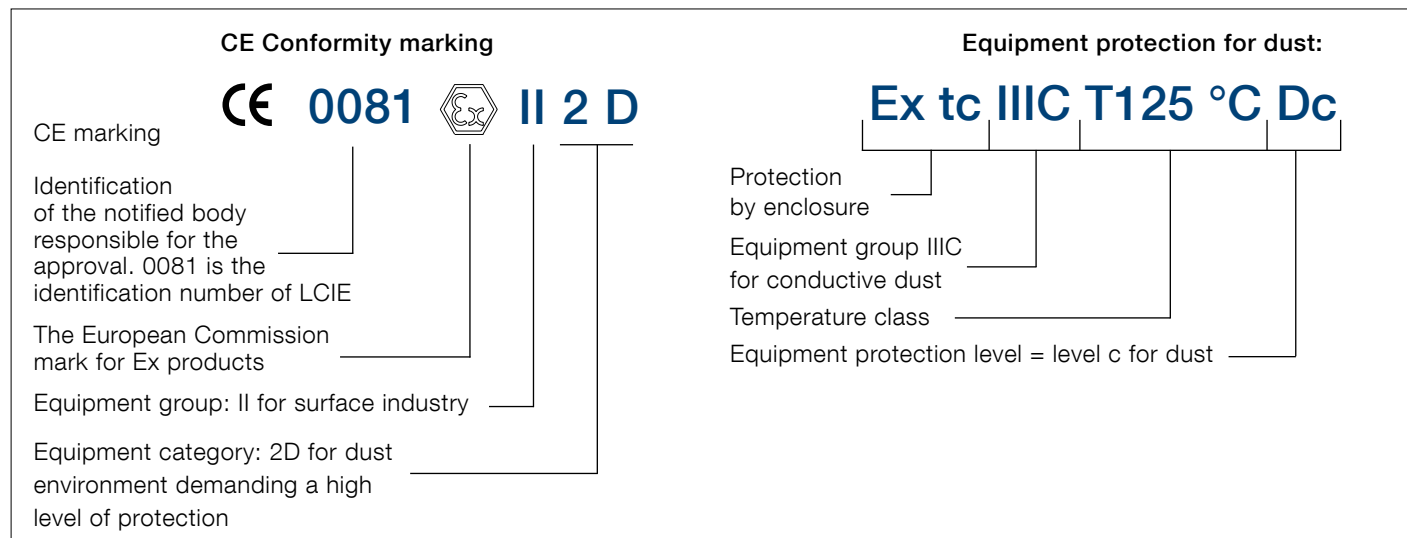
		T_{cl} (cloud) °C	T_{5mm} (layer) °C	Surface temperature provided that dust layer below 5 mm
Food/Feeder industry	Wheat	350	270	195
	Barley, corn	380	280	205
	Sugar	350	430	233
Natural materials	Wood	330	280	205
	Charcoal	520	230	195
	Hard coal	460	240	165
Chemicals	PVC	450	330	255
	Synth. rubber	470	220	145
	Sulfur	240	250	160

Source BIA-report 13/97 HVBG

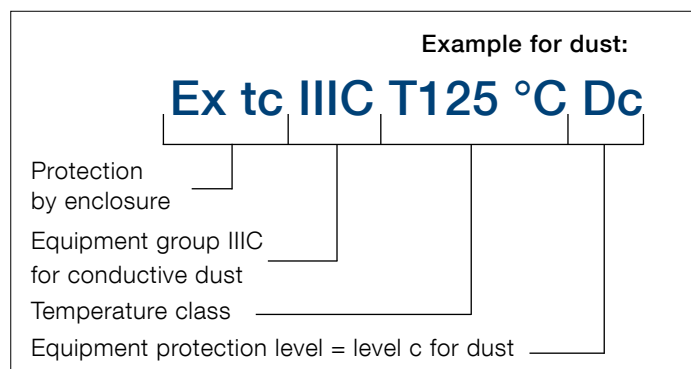
Dust subdivisions

IIIA	combustible flyings
IIIB	non-conductive dust
IIIC	conductive dust

Marking of equipment protection for dust according to ATEX



Marking of equipment protection for dust according to IEC



Selection of products for explosive atmospheres
EN Standard and ATEX Directive for dust environments

