



Hazardous Location Electrical Markings – Equipment Protection Level

Introduction

This edition on Hazardous Location (HazLoc) electrical equipment markings will discuss the equipment protection level (EPL) used by National Fire Protection Association (NFPA) 70 (National Electric Code (NEC)) and the International Electrotechnical Commission (IEC) 60079-series.

NFPA 70, Article 500

Article 500 does **not** have a requirement for an EPL or any related markings.

NFPA 70, Article 505

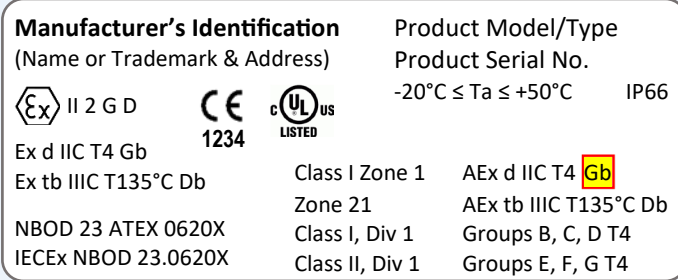


Figure 1: Equipment label with NFPA 70, Article 505 EPL indicated

Article 505 does **not** have a requirement for the EPL as part of the markings, but NFPA 70 (2017), Article 505.9(C) does include a note that the EPL **may appear** (as indicated in figure 1) in the product marking and provides a short EPL summary that aligns with the IEC discussion that follows.

IEC 60079-Series

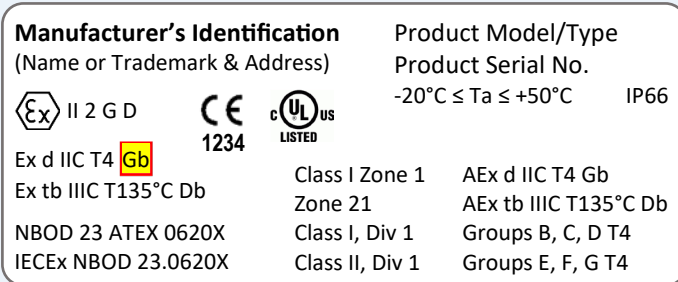


Figure 2: Equipment label with IEC EPL indicated

EPLs were introduced by the IEC in 2006 and became a marking requirement in IEC 60079-0 (2007). Figure 2 shows the EPL component of the IEC marking. EPLs were not discussed in the IEC 60079-series previously incorporated by reference (IBR) in U.S. regulations. 60079-0, however, is a “normative reference” within other 60079-series listed as 46 CFR Subchapter J IBRs effective on April 17, 2023 (see [88 FR 16310](#)).

The EPL is a risk assessment approach for the acceptance of “Ex” equipment introduced as an alternative method to the prescriptive approach linking equipment to zones. EPLs were introduced to **clearly indicate the inherent ignition risk of equipment**, no matter the type of protection used.

The system of designating these EPLs consists of:

- Group I (Coal mining) – EPLs Ma and Mb;
- Group II (Gases) – EPLs Ga, Gb and Gc; and
- Group III (Dust) – EPLs Da, Db and Dc.

We will concentrate on Group II for gases, but note that units or vessels subject to USCG inspection or oversight may have areas to which Group III applies.

EPL “Ga” is “equipment for explosive gas atmospheres, having a “very high” level of protection, which is not a source of ignition in normal operation, during expected malfunctions or during rare malfunctions” (IEC 60079-0 (2017), Clause 3.33.3).

EPL “Gb” is “equipment for explosive gas atmospheres, having a “high” level of protection, which is not a source of ignition in normal operation during expected malfunctions” (IEC 60079-0 (2017), Clause 3.33.4).

EPL “Gc” is “equipment for explosive gas atmospheres, having an “enhanced” level of protection, which is not a source of ignition in normal operation and which may have some additional protection to ensure that it remains inactive as an ignition source in the case of regular expected occurrences (for example failure of a lamp)” (IEC 60079-0 (2017), Clause 3.33.5).

EPLs typically correspond to a Zone (table 1). As discussed in [Drill Down #26](#), several protection techniques are subdivided by EPL (e.g. Ex “db”, and “dc” for flameproof equipment).

Traditional Relationship of EPLs to Zones	
Equipment Protection Level	Zone
Ga	0
Gb	1
Gc	2

Table 1: EPL/Zone relationship

Conclusion

EPLs identify products according to their inherent ignition risk. This marking provides a quick reference showing that it is safe for installation for the identified Zone based on this ignition risk.

The next *Drill Down* on HazLoc electrical equipment markings will examine certificate numbers and special symbols.