



Hazardous Location Electrical Markings – Applicable Standards

Introduction

This edition of the *Drill Down* begins a multi-part series on the interpretation of markings for electrical equipment installed in a Hazardous Location or Hazardous Area, abbreviated in this series as HazLoc. This analysis is intended to help personnel understand electrical equipment markings to verify that the equipment is safe for the areas in which it is installed. Figure 1 is an example label that will be used throughout this HazLoc electrical markings series.




Manufacturer's Identification (Name or Trademark & Address)		Product Model/Type Product Serial No.	
 II 2 G D	 1234	 LISTED	-20°C ≤ Ta ≤ +50°C IP66
Ex d IIC T4 Gb	Class I Zone 1	AEx d IIC T4 Gb	
Ex tb IIIC T135°C Db	Zone 21	AEx tb IIIC T135°C Db	
NBOD 23 ATEX 0620X	Class I, Div 1	Groups B, C, D T4	
IECEx NBOD 23.0620X	Class II, Div 1	Groups E, F, G T4	

Figure 1: Example HazLoc electrical equipment label

This *Drill Down* will focus on the standards that are utilized for HazLoc electrical equipment compliance for vessels or OCS facilities subject to U.S. Coast Guard (USCG) regulatory requirements.

Standards for Compliance prior to April 17, 2023

U.S. vessels, other than offshore supply vessels (OSVs) regulated under 46 CFR Subchapter L, built **on or before April 2, 2018**, follow the regulations found in 46 CFR 111.105.

U.S. and foreign mobile offshore drilling units (MODUs), floating OCS facilities (FOFs) and vessels conducting OCS activities built **after April 2, 2018**, must follow the regulations found in 46 CFR 111.108. U.S. MODUs, FOFs, vessels other than Subchapter L OSVs and U.S. tank vessels may comply with §111.108 in lieu of specific sections of §111.105.

OSVs built **on or before August 18, 2014**, must follow the regulations found in 46 CFR 111.105 in accordance with (IAW) §129.520. OSVs of less than 6,000 GT ITC or 500 GRT built **after August 18, 2014**, must follow the regulations in §111.105 IAW §129.110(b), while OSVs 6,000 GT ITC or 500 GRT

and larger built **after August 18, 2014**, must follow the regulations at §111.106 IAW §129.110(a).

These regulations have standards that are incorporated by reference (IBR), each with its own marking system or “scheme” for HazLoc electrical equipment.

Units¹ or vessels required to follow the IBRs found in **46 CFR 111.105-1** have three marking systems:

- 1) A national marking system found in National Fire Protection Association (NFPA) 70 (National Electric Code (NEC)), ninth edition (2002), **Article 500** (encompassing electrical protection methods of Articles 500 through 504);
- 2) A national marking system found in NFPA 70 (2002), **Article 505** that closely resembles the international marking system; and
- 3) The “international marking system” found in International Electrotechnical Commission (IEC) **60079-0**, 3.1 edition (June 2001).

Units or vessels required to comply with **46 CFR 111.106-3** or **§111.108-3**² can follow the standards of NFPA 70 (2011 Edition), Articles 500 or 505, or IEC 60079-0 (via additional IEC standards referenced as IBRs, e.g. IEC 60092-502, 61892-7). Other than the IBR edition, the marking systems are the same as the §111.105-1 IBRs.

Standards for Compliance on or after April 17, 2023

The USCG published a final rule via [88 FR 16310](#) on March 16, 2023 that updated the aforementioned IBRs. The referenced standards mostly remained the same but were updated to a more recent edition of the standard, although not necessarily the current edition. Units built **on or after April 17, 2023**, must comply with the updated editions of the IBRs.

Under this rulemaking, NFPA 70 was updated to the 2017 Edition for the previously cited regulations. The IEC 60079-series vary in edition with the specific part (e.g. 60079-1, 60079-7), spanning 2011 to 2017 in editions. The reference to IEC 60079-0 was removed, but it is utilized as a “normative reference” within each IEC 60079 part that is an IBR and is therefore, still applicable. Normative references in IEC standards function like IBRs in CFRs.

¹ The term “unit” in this *Drill Down* includes OCS facilities and vessels as the term is defined at [33 CFR 140.10](#).

² NFPA 496 compliant electrical equip used as an alternative to NFPA 70, Articles 500-504 doesn't require independent lab marking (§111.108-3(d)).

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Any images not given source credit were utilized from internal Coast Guard sources.

We will utilize the updated IBRs, and cite them accordingly, throughout this HazLoc electrical markings series. It is important to note that installed equipment may be built to, and be marked in accordance with, newer editions of the standards than those cited as IBRs.

See the appendix to this *Drill Down* (page 3) for a reference chart that summarizes the regulatory cites, applicable standards and implementation dates previously discussed.

When is ATEX Equipment Acceptable?

ATEX equipment will often be encountered when inspecting HazLoc equipment and denoted by the presence of the ATEX symbol (figure 2) and associated ATEX markings. “ATEX” is derived from the first two letters of the French words “atmosphères explosibles” that translate into “explosive atmospheres” and is a European Union directive addressing the same. The USCG has stated that ATEX equipment **will not** be accepted³. This is due to the provision that allows manufacturers to self-certify certain equipment for hazardous areas under the ATEX directive, while the USCG requires HazLoc equipment to be certified by an independent, third party.



Figure 2: ATEX Symbol

There are cases where ATEX equipment may be used, such as when the equipment is tested and certified to the applicable standards contained within 46 CFR Subchapter J by an [independent laboratory](#) that is accepted by the USCG (e.g. UL). In this case, the equipment is not accepted as ATEX equipment, but because it meets other required standards. Additional HazLoc equipment markings will be present on the equipment to show compliance with U.S. and/or IEC requirements.

U.S. Coast Guard Accepted Labs



Figure 3: CGMIX accepted labs search location

USCG accepted laboratories (third party) can be verified through the USCG Maritime Information Exchange (CGMIX) webpage at <https://cgmix.uscg.mil/>. Locate the accepted labs search page via the menu path of “Search CGMIX > USCG Accepted Laboratories > Accepted Labs

Search” (figure 3) and conduct a search for “Hazardous Locations (111.105/106/108)” from the [accepted laboratories search page](#) (figure 4).

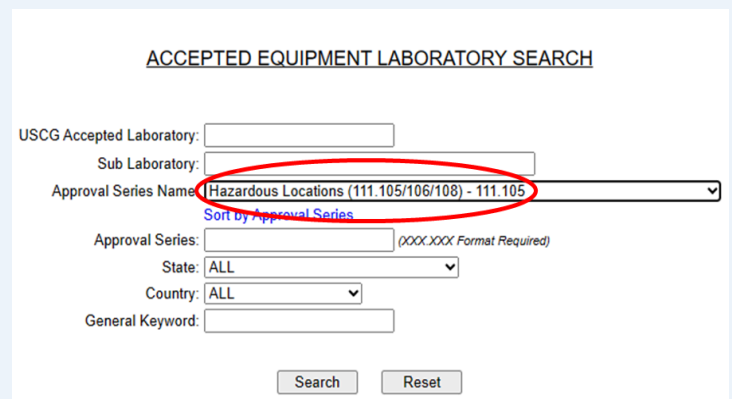


Figure 4: CGMIX accepted labs search page

Conclusion

The numerous compliance standards, protection methodology and associated markings incorporated for electrical equipment installed in hazardous locations result in a complicated subject. While the revised editions of the incorporated standards may be similar to earlier editions, there are differences, so it is important to ensure that the correct edition is being referenced when inspecting or examining HazLoc equipment for compliance on a particular unit or vessel.

Subsequent editions of this *Drill Down* series will examine individual components that comprise HazLoc electrical equipment markings. The following topics are included in this series:

- Applicable Standards (this edition)
- Locations (classification systems for Division and Zones)
- Material Groups
- Protection Techniques
- Temperature Classes and Ratings
- Equipment Protection Levels
- Equipment Certificates and Special Symbols
- Degrees of Protection

The marking requirements of NFPA 70, Articles 500 and 505 and IEC 60079-0 will be reviewed as they relate to each topic.

Note: This HazLoc markings series does not attempt to instill competence to an individual but has the intended purpose of bringing awareness of the applicable standards incorporated through U.S. Coast Guard regulations and to what is indicated by each component of HazLoc electrical equipment markings.

³ See discussion in the March 31, 2015 final rule published as [80 FR 16980](#).

Hazardous Location Electrical Equipment Standards

Build Date	MODUs, FOFs, Vessels conducting OCS Activities & Vessels carrying Flammable/Combustible Cargo	46 CFR Subchapter L OSVs < 6,000 GT ITC (500 GRT)	46 CFR Subchapter L OSVs ≥ 6,000 GT ITC (500 GRT)
On/before April 2, 2018	NFPA 70 (9 th Ed.; 2002) Art. 500-505 or IEC 60079 series (-0, Ed. 3.1, 2000; -1, 4 th Ed., 2001; -2 4 th Ed., 2001; -5, 2 nd Ed., 1997; -6, 2 nd Ed., 1995; -7, 3 rd Ed., 2001; -11, 4 th Ed., 1999; -15, 2 nd Ed., 2001; and -18, 1 st Ed., 1992) for FOFs U.S. MODUs and vessels IAW 46 CFR 111.105	-	-
April 3, 2018 thru April 16, 2023	NFPA 70 (2011 Ed.) Art. 500-504 or NFPA 70 (2011 Ed.) Art. 505 or Clause 6 of IEC 61892-7 (2007 Ed.) for FOFs and U.S. and foreign vessels on the OCS; Chapter 6 of 2009 MODU Code (unamended ; 2010 Ed.) for U.S. and foreign MODUs; or Clause 6 of IEC 60092-502 (5 th Ed.; 1999) for U.S. tank vessels IAW 46 CFR 111.108(b)(1) thru (3)	-	-
On/before August 18, 2014	-	Same as 19Aug2014-16Apr2023	N/A
August 19, 2014 thru April 16, 2023	-	Explosion-Proof Equipment NFPA 70 (9 th Ed., 2002) and UL 1203 (3 rd Ed., 07Sep2000, incl. revisions thru 30Apr2004) Flame-Proof Equipment IEC 60079-1 (4 th Ed.; Jun 2001) Intrinsically Safe Equipment UL 913 (7 th Ed., 31Jul2006, incl. revisions thru 03Jun2010) or IEC 60079-11 (4 th Ed., 1999) (for approved components); and ISA RP 12.6 (1999 Ed., Part 1) (for wiring methods) IAW 46 CFR 111.105 via §129.520	NFPA 70 (2011 Ed.) Art. 500-504 or NFPA 70 (2011 Ed.) Art. 505 or IEC 60092-502 (5 th Ed.; 1999) IAW 46 CFR 111.106(b)(1) thru (3) Note: There was no regulatory provision/allowance for ≥ 6,000 GT ITC (500 GRT) Subchapter L OSVs prior to this date.
On/after April 17, 2023 (incorporated references updated by 88 FR 16310)	NFPA 70 (2017 Ed.) Art. 500-504 or NFPA 70 (2017 Ed.) Art. 505 or Clause 8 of IEC 61892-7 (2019 Ed.) for FOFs and U.S. and foreign vessels on the OCS; Chapter 6 of 2009 MODU Code (unamended ; 2010 Ed.) for U.S. and foreign MODUs; or Clause 6 of IEC 60092-502 (5 th Ed.; 1999) for U.S. tank vessels IAW 46 CFR 111.108(b)(1) thru (3)	Explosion-Proof/Flame-Proof Equipment Post-IBR regulatory path for non-intrinsically safe systems points to removed/reserved cites (broken regulatory link pending correction) Intrinsically Safe Equipment NFPA 70 (2017 Ed.) 504.10(A) (for plans); ANSI/ISA RP 12.06.01 (2003 Ed.) (wiring methods) and NFPA 70 (2017 Ed.) Article 504 or Clause 7 of IEC 60092-502 (5 th Ed.; 1999) IAW 46 CFR 111.105 via §129.520	NFPA 70 (2017 Ed.) Art. 500-504 or NEC 70 (2017 Ed.) Art. 505 or IEC 60092-502 (5 th Ed.; 1999) IAW 46 CFR 111.106-3(b)(1) thru (3)