

SCOPE

- I 1.1 This practice covers the classification of areas where flammable liquids, gases, or vapors are handled, processed, or stored.
- I 1.2 The requirements of this practice are intended for application to petroleum refineries and similar petrochemical facilities.
- I 1.3 **An asterisk (*)** indicates that additional information is required. If a job is contracted, this additional information is furnished in the Job Specification.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I ↗ 2.1 **Table 1** lists the standards (including recommended practices) which shall be used with this practice.

TABLE 1

STANDARDS	
ANSI / NFPA Standards	
70	National Electrical Code (NEC)
496	Standard for Purged and Pressurized Enclosures for Electrical Equipment (National Fire Codes, vol. 7)
497	Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas (Revised and Redesignated from NFPA 497A - 1992 and part of NFPA 497M - 1991 (National Fire Codes, vol. 11)). (1)
API Recommended Practices (RP)	
RP 500	Classification of Locations for Electrical Installations at Petroleum Facilities as Class I, Division 1 and Division 2 - November 1997
RP 505	Classification of Locations for Electrical Installations at Petroleum Facilities as Class I, Zone 0, Zone 1, and Zone 2 - November 1997
International Electrotechnical Commission (IEC) Standard	
60079-10	Electrical Apparatus for Explosive Gas Atmospheres - Part 10: Classification of Hazardous areas
60079-14	Electrical Apparatus for Explosive Gas Atmospheres - Part 14: Electrical Installations in Hazardous Areas (Other Than Mines)
OTHER REGIONAL OR NATIONAL STANDARDS	
Appropriate Regional or National Standard Applicable to the specific location.	

Note:

- (1) The application of **NFPA 497** shall be limited to small or batch type plants in accordance with **NFPA 497**. Continuous process or large batch type plants shall comply with **API RP 500 / 505** and this practice.

- I 2.2 Where compliance with any code or standard specified by an authority having jurisdiction is mandatory, the prescribed regulation shall be met.

DOCUMENTATION

- S ↗ 3.1 **Area classification drawings** shall be prepared by the contractor as follows:
 - a. The classification and extent of each area shall be shown with major structures and equipment indicated.
Drawings shall provide plan views and those sectional views required to supplement **API RP 500 / 505** and **Figure 1** of this practice.
 - b. All equipment which is considered a source of flammable liquid, gas or vapor shall be shown on the drawings. Each source shall be identified by equipment number, flammable material(s) handled, flash point(s) and ignition temperature(s), and atmosphere group(s) according to the standard(s) to which electrical equipment is to be purchased.
 - c. Drawings shall specify the edition date of the standard used for the classification and note exceptions which have been taken.

DEFINITIONS

- I 4.1 **Flammable liquids**, for purposes of area classification, are those having:
- Closed cup **Flash points** below 100°F (37.8°C), or
 - Temperatures above or within 15°F (8°C) of their closed cup **flash points**.
- I 4.2 The following table is a guide for defining and correlating the Class 1 Division and Zone designations per NEC with the Zone designation system for classified areas used by IEC and other regional and national standards.

NEC CLASS 1 DESIGNATIONS	DEFINITION & CORRELATION OF TERMS "PRESENCE OF IGNITABLE CONCENTRATIONS OF FLAMMABLE GASES AND VAPORS..."	IEC CLASS I DESIGNATION
Division 1 / Zone 0	Continuously or for long periods	Zone 0 (1)
Division 1 / Zone 1	Under normal operating conditions	Zone 1
Division 1 / Zone 1	Frequently because of repair, maintenance or leakage	Zone 1
Division 1 / Zone 1	Due to equipment breakdown or faulty operation might release ignitable concentration and might also cause simultaneous failure of electrical equipment that could become a source of ignition	Zone 1
Division 2 / Zone 2	In cases of abnormal equipment operation or breakdown or rupture of closed containers or closed systems	Zone 2
Division 2 / Zone 2	Not normally present due to prevention by positive ventilation. Air/gas mixture might become ignitable through failure or abnormal operation of the ventilating equipment	Zone 2
Division 2 / Zone 2	In a location adjacent to a Division 1 / Zone 1 location and not separated by a vapor tight barrier. No actual source in this area, but ignitable concentrations of gases or vapors might occasionally be communicated from the adjacent area.	Zone 2 or Unclassified (2)

Note:

- (1) For this condition, **IEC 60079-14** requires installation of intrinsically safe apparatus and systems.
- (2) **IEC 60079-10** treats areas adjacent to Zone 1 areas such that it is possible to go from an area with continuously present flammable vapors to an unclassified area, even when there is no physical barrier between the two areas.

AREA CLASSIFICATION

- S 5.1 **All areas shall be classified** in accordance with **API RP 500** for Class I Division type classification or **API RP 505** for Class I Zone type classification, except as modified in the following paragraphs.
- S 5.2 **Figures 2 through 28 of API RP 500 and API RP 505** shall be applied with the following modifications:
- For adequately ventilated process area buildings with heavier-than-air gas sources use **Figure 1** of this practice (there is no similar figure in **API RP 500/505**).
 - Figure 28** for mechanical draft cooling towers handling process cooling water shows a wet pump pit classified as Division 1 / Zone 1. Dry pump pits shall also be classified as Division 1 / Zone 1 when they are wholly or partly located within 3 m (10 ft) of the cooling water tower structure.
- I 5.3 The "Additional Division 2 area" shown in **Figures 20-22 of API RP 500/505** and in **Figure 1** of this practice are required. **Where the release source** which determines classification does not have the capability of producing a large quantity of flammable liquid, gas, or vapor, the "Additional Division 2 area" may be waived if approved by the Owner's Engineer.