WHAT IS INCREASED SAFETY?

Adalet Increased Safety 'Exe' Information
1) National Electrical Code Article 505

Article 505 was first introduced in the 1996 National Electrical Code. This new Article offered an alternative for the classification of hazardous locations based on the standards for area classification developed by the International Electrotechnical Commission (IEC). With the introduction of this new Article, engineers could now classify hazardous locations using either Article 500 or Article 505. In 1999, further revision to Article 505 continued to bring it closer to the IEC 79 series of standards. The 1999 NEC changes introduced: 1) the eight different Protection Methods used by IEC, 2) the inclusion of metric threaded holes, and 3) special precautions involving area classification, dual classification, and the reclassification of division classified areas.
Note 1: Products approved for use in areas classified Class I Zone 0, 1, & 2 are permitted in Class I Division 2 areas for the same gas and with a suitable temperature class.

Note 2: Products approved for use in area classified Class I Zone 0 are permitted in Class I Division 1 & 2 areas for the same gas and with a suitable temperature class

Note 3: Products approved for use in areas classified under Article 500 are allowed to be installed in Article 505 areas, except Zone 0.

Note 4: The IEC Classification scheme also addresses underground mines. Article 505 does not address this area classification. All mines in the United States fall under the jurisdiction of the Mine Safety and Health Administration (MSHA).

2) CENELEC

CENELEC is the European Committee for Electrotechnical Standardization. It was established in 1973 as a non-profit organization under Belgium Law. It has been officially recognized as the European Standards Organization in its field by the European Commission under Directive 83/189/EEC. Each member country typically has at least one recognized test agency or notified body. These members have been working together in the interest of European harmonization since the late fifties, developing alongside the European Economic Community. CENELEC works with 35,000 technical experts from 19 countries to publish standards for the European market.

3) Increased Safety 'Exe' Principle

Intended for products in which arcs and sparks do not occur in normal service nor under fault conditions and in which surface temperatures are controlled below incendive values. Increased Safety is achieved by enhancing insulation values and creepage and clearance distances above those required for normal service, thus providing a safety factor against accidental breakdown.

4) Increased Safety 'Exe' Key Design Features

Enclosure: must be constructed so as to withstand mechanical impact and provide a specified degree of ingress protection (Minimum IP 54 rating).

Terminals for external connections: must be generously dimensioned for the intended connection and ensure that conductors are securely fastened.

Internal connections: must not be subject to undue mechanical stress and shall be made using specified methods.

Clearance: between bare conductive parts must not be less than the values specified according to the rated voltage.

Creepage distances: must not be less than the values specified according to the rated voltage and the Comparative Tracking Index (CTI) of the insulating material.

Temperatures: of parts of equipment must be limited so as not to exceed values which would affect the thermal stability of the material and the T-Class relating to the ignition of explosive atmospheres.

5) An Alternative to Flameproof 'Exd'

Increased Safety Enclosures:
These enclosures provide an alternative to flameproof enclosures and are commonly made of sheet steel, fiberglass, and die cast aluminum.

They are intended to house electrical equipment that will not generate an arc or spark during normal operation.

Additional design measures are taken to prevent the possibility of excessive heat, the ingress of water or dust, and the resistance to impact, thus preventing any explosion from occurring.

Flameproof Enclosures:
Theses enclosures are typically a bolted construction or screw cover design made of cast aluminum.

They are intended to house electrical equipment that could possibly cause an arc or spark during normal operation.

With sufficient wall section thickness and flamepath lengths, these enclosures will withstand internal explosion pressures and extinguish any flame before transmitting hot gases to the outside hazardous atmosphere.

6) 'Exe' Comparison 'Exd'

INCREASED SAFETY
Areas of use:
Zones 1 and 2

Applicable Design Standards

- European: EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 and EN 61241-1:2004

FLAMEPROOF
Areas of use:
Zones 1 and 2 and Division 1-2

Applicable Design Standards

- European: EN 60079-0:2006 & EN 60079-1:2007
- International: IEC 79-0 & IEC 79-1

- International: IEC 79-0 & IEC 79-7
- IEC 60 079-0 & IEC 60 079-7
- Canadian: CSA-E79-0 & CSA-E79-7
- U.S.: UL 2279 Pt. 7

Typical testing for Increased Safety

- Thermal conditioning test
- Mechanical strength
- Ingress Protection (IP rating)
- Temperature rise
- Electrical strength
- Thermal Stability of insulating materials

- IEC 60 079-0 & IEC 60 079-1
- Canadian: CSA-E79-0, CSA- E79-1, CSA-22.2 No. 30
- U.S.: UL 2279 Pt. 1, UL1203

Typical testing for Flameproof

- Thermal conditioning test
- Mechanical strength
- Ingress Protection (IP rating)
- Temperature rise
- Electrical strength
- Thermal Stability of insulating materials