



FOR EUROPE



LCIE



FOR INTERNATIONAL

# SIMULTANEOUS APPROVALS

Providing access to ATEX and IECEx global markets

Single set of tests and assessment  
Electrical and mechanical standards are technically identical  
Requirements for manufacturers' quality assurance are identical

## PROTECTION CONCEPTS

| GAS ATMOSPHERES            |                        |                      |                            |                    |              |                     |  |
|----------------------------|------------------------|----------------------|----------------------------|--------------------|--------------|---------------------|--|
| Installation               | ATEX category          | IEC Protection Level | Mode of Protection         | IEC / EN Standards | EN Standards | ISO / IEC Standards | Protection concept                               |
| ZONE 2<br>ZONE 1<br>ZONE 0 | II 1 G                 | EPL Ga               | ma                         | 60079-10           |              |                     | Zones classification                             |
|                            |                        |                      |                            | 60079-0            |              |                     | General requirements                             |
|                            |                        |                      |                            | 60079-1            |              |                     | Flameproof enclosure                             |
|                            |                        |                      |                            | 60079-11           |              | ia                  | Intrinsic safety                                 |
|                            |                        |                      |                            | 60079-18           |              | ma                  | Encapsulation                                    |
|                            |                        |                      |                            | 60079-25           |              |                     | Intrinsically safe system                        |
|                            |                        |                      |                            | 60079-26           |              |                     | Equipment protection level EPL Ga                |
|                            |                        |                      |                            | 60079-27           |              |                     | FISCO and FNICO                                  |
|                            |                        |                      |                            | 60079-28           |              |                     | Optical radiation                                |
|                            |                        |                      |                            | 80079-36           | 80079-36     |                     | Non electrical equipment. General requirements   |
|                            |                        |                      |                            | 80079-37           | 80079-37     |                     | Non electrical equipment. Constructional safety  |
| ZONE 2<br>ZONE 1           | II 2 G                 | EPL Gb               | mb                         | 60079-0            |              |                     | General requirements                             |
|                            |                        |                      |                            | 60079-1            |              |                     | Flameproof enclosure                             |
|                            |                        |                      |                            | 60079-2            |              |                     | Pressurised enclosure                            |
|                            |                        |                      |                            | 60079-2            |              |                     | Pressurised enclosure                            |
|                            |                        |                      |                            | 60079-5            |              |                     | Powder filled                                    |
|                            |                        |                      |                            | 60079-6            |              |                     | Oil immersion                                    |
|                            |                        |                      |                            | 60079-7            |              |                     | Increased safety                                 |
|                            |                        |                      |                            | 60079-11           |              |                     | Intrinsic safety                                 |
|                            |                        |                      |                            | 60079-13           |              |                     | Pressurised room                                 |
|                            |                        |                      |                            | 60079-18           |              |                     | Encapsulation                                    |
|                            |                        |                      |                            | 60079-25           |              |                     | Intrinsically safe system                        |
| 60079-27                   |                        |                      | FISCO and FNICO            |                    |              |                     |  |
| 60079-28                   |                        |                      | Optical radiation          |                    |              |                     |  |
| 60079-30-1                 |                        |                      | Trace heating              |                    |              |                     |  |
| ZONE 2                     | II 3 G                 | EPL Gc               | mc                         | 60079-0            |              |                     | General requirements                             |
|                            |                        |                      |                            | 60079-1            |              |                     | Flameproof enclosure                             |
|                            |                        |                      |                            | 60079-2            |              |                     | Pressurisation                                   |
|                            |                        |                      |                            | 60079-5            |              |                     | Oil immersion                                    |
|                            |                        |                      |                            | 60079-7            |              |                     | Increased safety                                 |
|                            |                        |                      |                            | 60079-11           |              |                     | Intrinsic safety                                 |
|                            |                        |                      |                            | 60079-15           |              |                     | Non sparking                                     |
|                            |                        |                      |                            | 60079-15           |              |                     | Protected sparking                               |
|                            |                        |                      |                            | 60079-15           |              |                     | Energy limited                                   |
|                            |                        |                      |                            | 60079-15           |              |                     | Restricted breathing                             |
|                            |                        |                      |                            | 60079-18           |              |                     | Encapsulation                                    |
| 60079-25                   |                        |                      | Intrinsically safe system  |                    |              |                     |  |
| 60079-28                   |                        |                      | Optical radiation          |                    |              |                     |  |
| 60079-27                   |                        |                      | FISCO and FNICO            |                    |              |                     |  |
| ZONE 2<br>ZONE 1<br>ZONE 0 | II 1 G, II 2 G, II 3 G | EPL Ga, Gb, Gc       | h, h (c), h (b), h (k)     | 80079-36           | 80079-36     | 80079-36            | Non electrical equipment. General requirements   |
|                            |                        |                      |                            | 80079-37           | 80079-37     | 80079-37            | Non electrical equipment. Constructional safety  |
|                            |                        |                      |                            | 80079-37           | 80079-37     | 80079-37            | Non electrical equipment. Control of ignition    |
|                            |                        |                      |                            | 80079-37           | 80079-37     | 80079-37            | Non electrical equipment. Liquid immersion       |
|                            |                        |                      |                            | 60079-0            |              |                     | General requirements                             |
|                            |                        |                      |                            | 60079-1            |              |                     | Flameproof enclosure                             |
|                            |                        |                      |                            | 60079-2            |              |                     | Pressurisation                                   |
|                            |                        |                      |                            | 60079-5            |              |                     | Oil immersion                                    |
|                            |                        |                      |                            | 60079-7            |              |                     | Increased safety                                 |
|                            |                        |                      |                            | 60079-11           |              |                     | Intrinsic safety                                 |
|                            |                        |                      |                            | 60079-15           |              |                     | Non sparking                                     |
| 60079-15                   |                        |                      | Protected sparking         |                    |              |                     |  |
| 60079-15                   |                        |                      | Energy limited             |                    |              |                     |  |
| 60079-15                   |                        |                      | Restricted breathing       |                    |              |                     |  |
| 60079-18                   |                        |                      | Encapsulation              |                    |              |                     |  |
| 60079-25                   |                        |                      | Intrinsically safe system  |                    |              |                     |  |
| 60079-28                   |                        |                      | Optical radiation          |                    |              |                     |  |
| 60079-27                   |                        |                      | FISCO and FNICO            |                    |              |                     |  |
| ZONE 2<br>ZONE 1<br>ZONE 0 | II 1 D, II 2 D, II 3 D | EPL Da, Db, Dc       | ta, h, h (c), h (b), h (k) | 60079-14           |              |                     | Installation                                     |
|                            |                        |                      |                            | 60079-17           |              |                     | Inspection and maintenance                       |
|                            |                        |                      |                            | 60079-19           |              |                     | Repair, overhaul and reclamation                 |
|                            |                        |                      |                            | 80079-34           | 80079-34     | 80079-34            | Quality system for elec. and non elec. equipment |
|                            |                        |                      |                            | 60079-44           | 60079-44     | 60079-44            | Equipment assemblies                             |

| DUST ATMOSPHERES           |               |                      |  |                            |                        |                     |   |
|----------------------------|---------------|----------------------|--|----------------------------|------------------------|---------------------|---|
| Installation               | ATEX category | IEC Protection Level | Mode of Protection                               | IEC / EN Standards         | EN Standards           | ISO / IEC Standards | Protection concept                              |
| ZONE 2<br>ZONE 1<br>ZONE 0 | II 1 D        | EPL Da               | ta   | 61241-10                   |                        |                     | Zones classification                            |
|                            |               |                      |  | 60079-0                    |                        |                     | General requirements                            |
|                            |               |                      |  | 60079-1                    |                        | ia                  | Intrinsic safety                                |
|                            |               |                      |  | 60079-18                   |                        | ma                  | Encapsulation                                   |
|                            |               |                      |  | 60079-25                   |                        |                     | Intrinsically safe system                       |
|                            |               |                      |  | 60079-26                   |                        |                     | Protection by enclosure                         |
|                            |               |                      |  | 80079-36                   | 80079-36               | 80079-36            | Non electrical equipment. General requirements  |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Constructional safety |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Control of ignition   |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Liquid immersion      |
|                            |               |                      |  | ZONE 2<br>ZONE 1           | II 2 D                 | EPL Db              | tb  |
| 60079-1                    |               |                      | Intrinsic safety                                 |                            |                        |                     |   |
| 60079-13                   |               |                      | Pressurised room                                 |                            |                        |                     |   |
| 60079-18                   |               |                      | Encapsulation                                    |                            |                        |                     |   |
| 60079-25                   |               |                      | Intrinsically safe system                        |                            |                        |                     |   |
| 60079-26                   |               |                      | Protection by enclosure                          |                            |                        |                     |   |
| 80079-36                   | 80079-36      | 80079-36             | Non electrical equipment. General requirements   |                            |                        |                     |   |
| 80079-37                   | 80079-37      | 80079-37             | Non electrical equipment. Constructional safety  |                            |                        |                     |   |
| 80079-37                   | 80079-37      | 80079-37             | Non electrical equipment. Control of ignition    |                            |                        |                     |   |
| 80079-37                   | 80079-37      | 80079-37             | Non electrical equipment. Liquid immersion       |                            |                        |                     |   |
| ZONE 2                     | II 3 D        | EPL Dc               | mc   |                            |                        |                     |   |
|                            |               |                      |  | 60079-1                    |                        |                     | Intrinsic safety                                |
|                            |               |                      |  | 60079-25                   |                        |                     | Intrinsically safe system                       |
|                            |               |                      |  | 60079-31                   |                        |                     | Protection by enclosure                         |
|                            |               |                      |  | 60079-18                   |                        |                     | Encapsulation                                   |
|                            |               |                      |  | 80079-36                   | 80079-36               | 80079-36            | Non electrical equipment. General requirements  |
|                            |               |                      |  | 13443-2                    |                        |                     | Flow restricted enclosure                       |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Constructional safety |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Control of ignition   |
|                            |               |                      |  | 80079-37                   | 80079-37               | 80079-37            | Non electrical equipment. Liquid immersion      |
|                            |               |                      |  | ZONE 2<br>ZONE 1<br>ZONE 0 | II 1 D, II 2 D, II 3 D | EPL Da, Db, Dc      | h, h (c), h (b), h (k)                          |
| 60079-17                   |               |                      | Inspection and maintenance                       |                            |                        |                     |   |
| 60079-19                   |               |                      | Repair, overhaul and reclamation                 |                            |                        |                     |   |
| 80079-34                   | 80079-34      | 80079-34             | Quality system for elec. and non elec. equipment |                            |                        |                     |   |
| 60079-44                   | 60079-44      | 60079-44             | Equipment assemblies                             |                            |                        |                     |   |

## EXPLOSIVE ATMOSPHERES

### GAS GROUPS

I : Methane\*  
IIA : Propane\*  
IIB : Ethylene\*  
IIC : Hydrogen\* | \* Representative gas

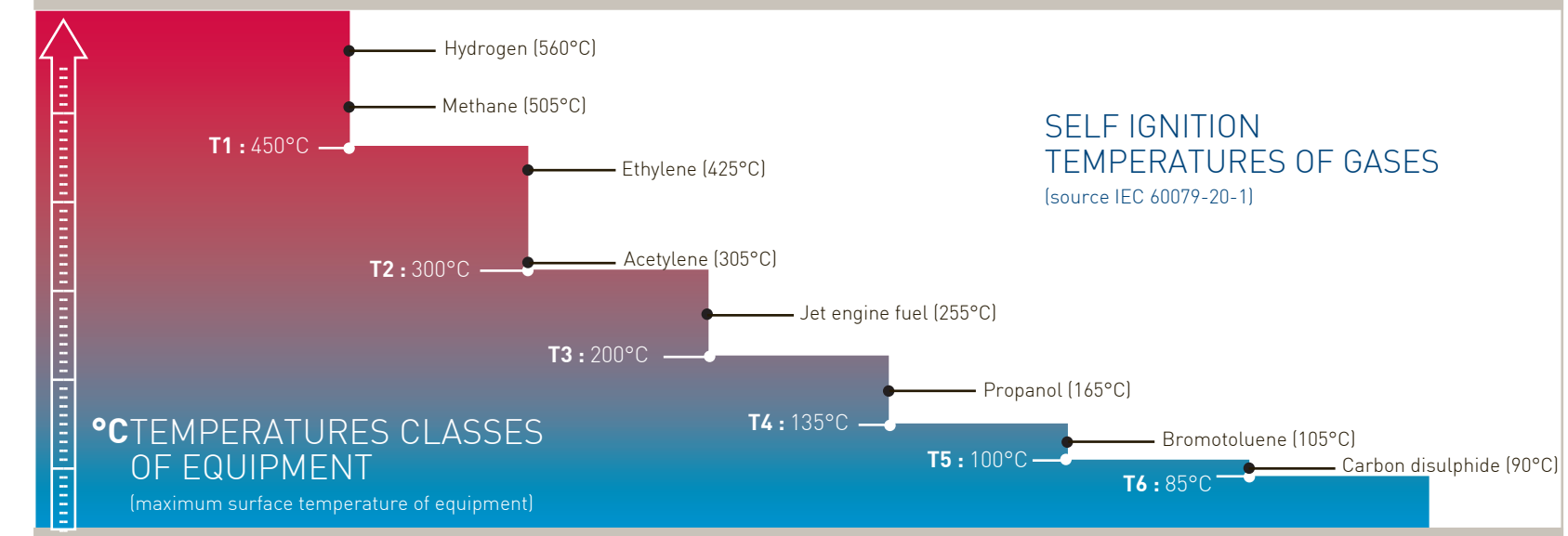
### DUST GROUPS

IIA : Combustible flyings  
IIB : Non conductive dust  
IIC : Conductive dust

### EQUIPMENT

| ATEX CATEGORY | IEC PROTECTION LEVEL (EPL) | ZONE OF INSTALLATION | ATMOSPHERE        |
|---------------|----------------------------|----------------------|-------------------|
| 1G            | Ga                         | 0                    | GAS               |
| 2G            | Gb                         | 1                    |                   |
| 3G            | Gc                         | 2                    |                   |
| 1D            | Da                         | 20                   | DUST              |
| 2D            | Db                         | 21                   |                   |
| 3D            | Dc                         | 22                   |                   |
| M1            | Ma                         | MINING               | COAL DUST METHANE |
| M2            | Mb                         |                      |                   |

### TEMPERATURES

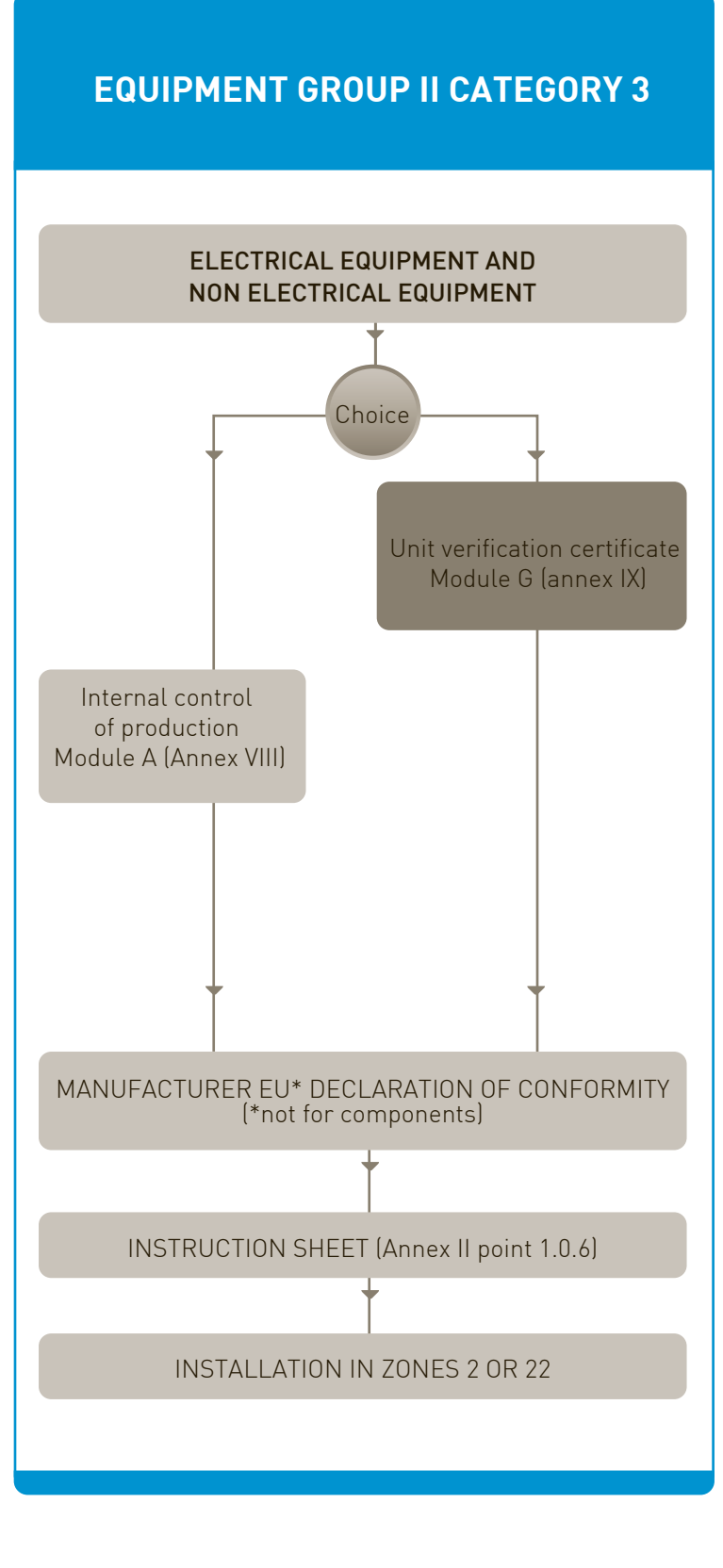
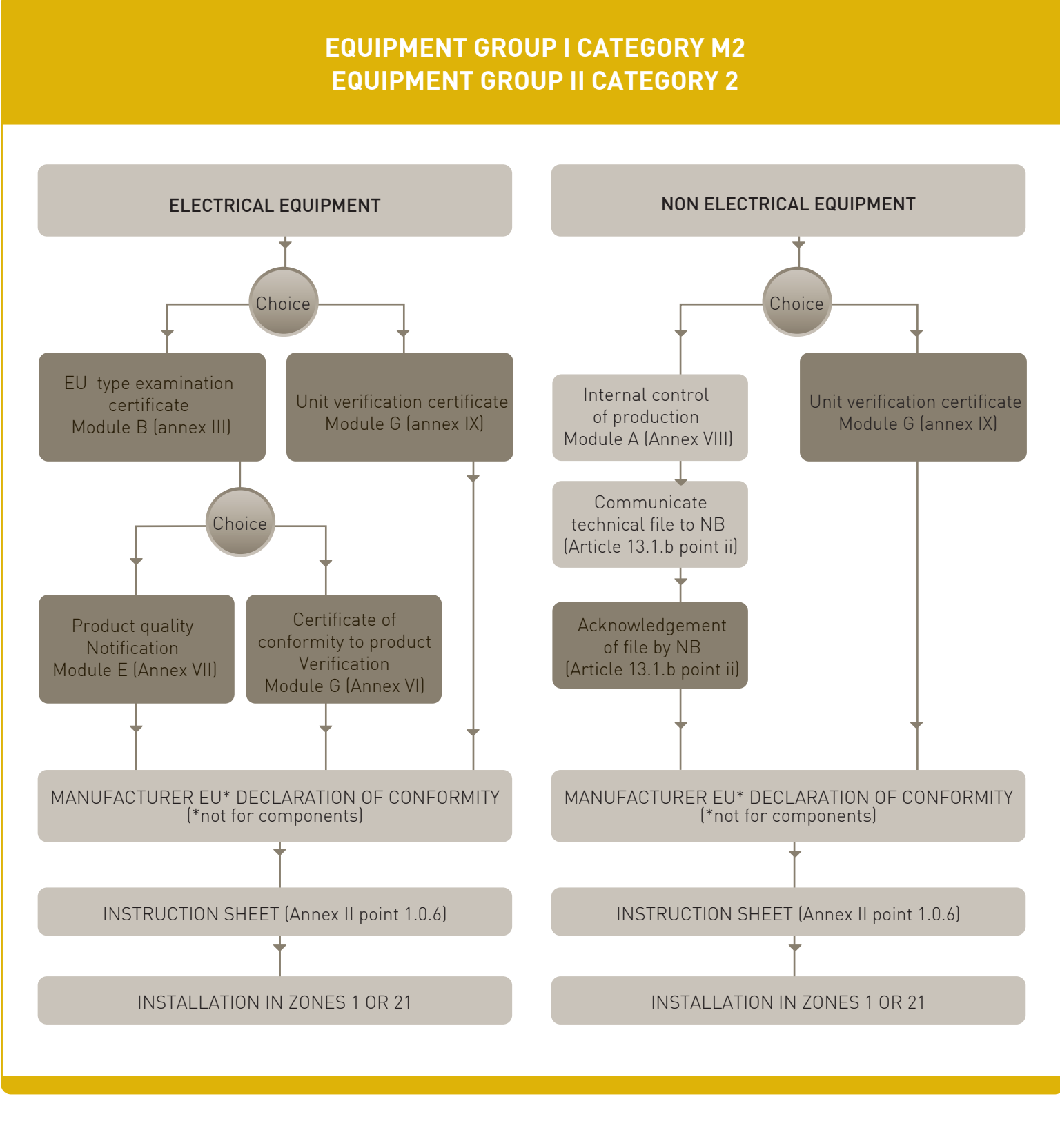
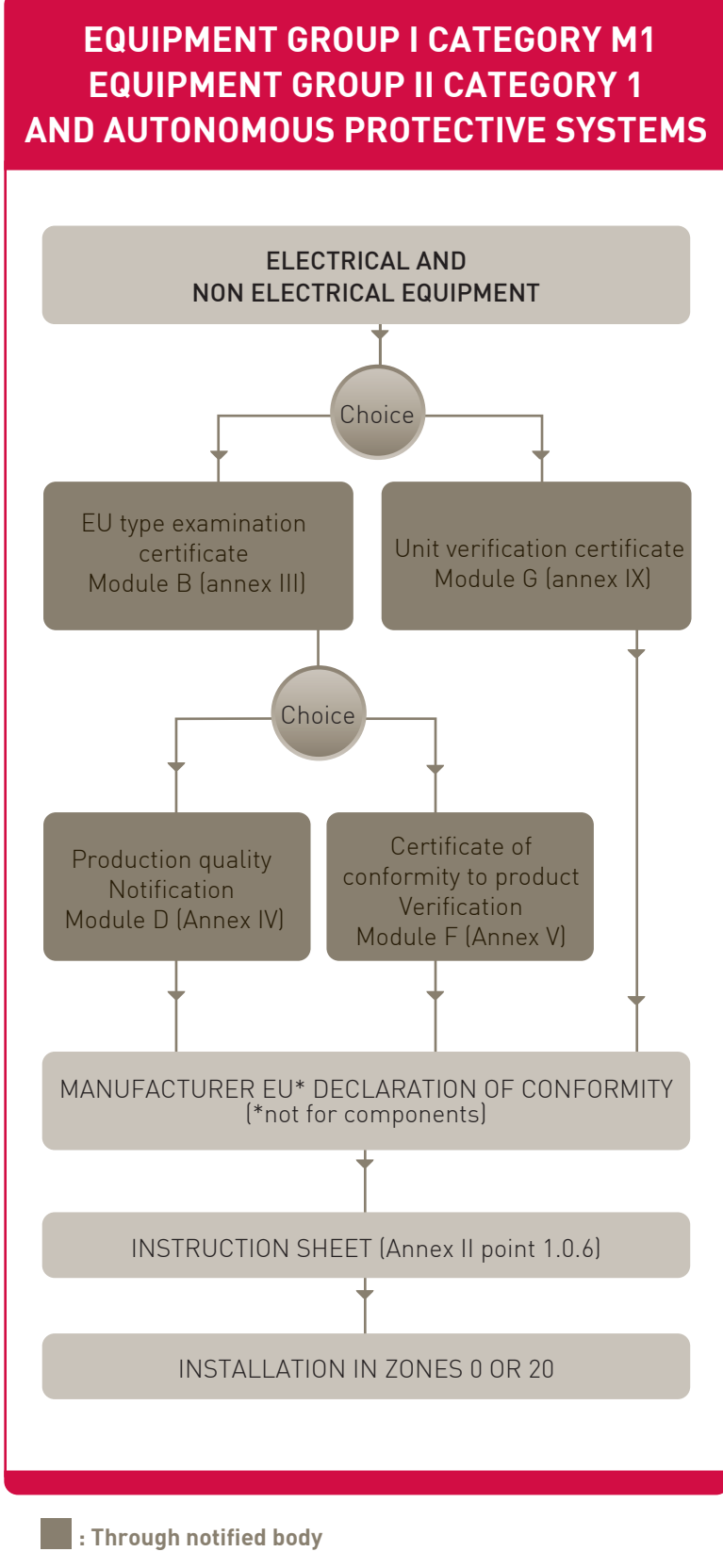


## INGRESS PROTECTION OF ENCLOSURES ACCORDING TO EN/IEC 60529

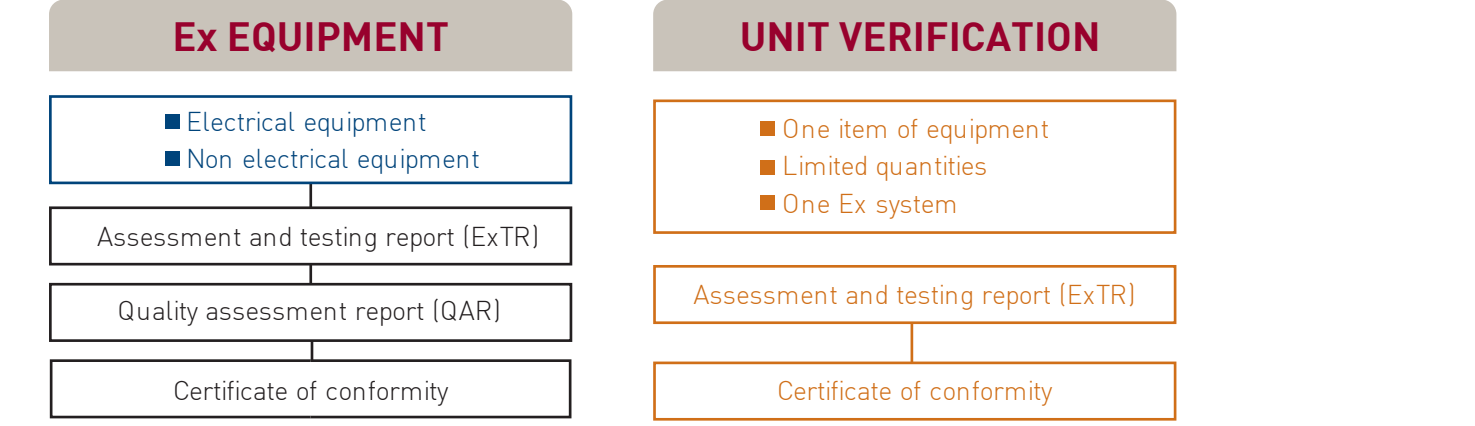
| IP | TESTS   |
|----|---|
| 0  | No protection   |
| 1  | Protected against solid bodies larger than 50mm (e.g. accidental contact with hand) |
| 2  | Protected against solid bodies larger than 12,5mm (e.g. finger of the hand)         |
| 3  | Protected against solid bodies larger than 2,5mm (tools, wires)                     |
| 4  | Protected against solid bodies larger than 1mm (fine tools, small wires)            |
| 5  | Protected against dust (no harmful deposit)   |
| 6  | Completely protected against dust   |

| IP | TESTS   |
|----|---|
| 0  | No protection   |
| 1  | Protected against vertically-falling drops of water (condensation)              |
| 2  | Protected against drops of water falling at up to 15° from the vertical         |
| 3  | Protected against drops of water falling at up to 60° from the vertical         |
| 4  | Protected against projections of water from all directions                      |
| 5  | Protected against jets of water from all directions                             |
| 6  | Completely protected against jets of water of similar force to heavy sea        |
| 7  | Protected against the effects of immersion                                      |
| 8  | Protected against the effects of prolonged immersion under specified conditions |

## ATEX CERTIFICATION PROCEDURES 2014/34/EU



## IECEx CERTIFICATION SYSTEM



## GENERAL INFORMATION

### ZONES / DIVISIONS CLASSIFICATION

| Country                | Explosive atmosphere | Reference       | Continuously present | Often present    | Accidentally present |
|------------------------|----------------------|-----------------|----------------------|------------------|----------------------|
| USA                    | GAS/DUST             | NEC 500         | Division 1           |                  | Division 2           |
|                        | GAS                  | NEC 505         | Class I - Zone 0     | Class I - Zone 1 | Class I - Zone 2     |
|                        | DUST                 | NEC 506         | Zone 20              | Zone 21          | Zone 22              |
| Europe / International | GAS                  | EN/IEC 60079-10 | Zone 0               | Zone 1           | Zone 2               |
|                        | DUST                 | EN/IEC 60079-10 | Zone 20              | Zone 21          | Zone 22              |

### COMPARISON IEC / CENELEC AND NEC

| Class          | Division | Group | REPRESENTATIVE SUBSTANCES   |          |       | IEC / EUROPE |
|----------------|----------|-------|---|----------|-------|--------------|
|                |          |       | Zone  | Group    | IEC   |              |
| GAS            | I        | A     | Acetylene   | 0-1-2    | II B  | II A         |
|                |          | B     | Hydrogen  |          |       |              |
|                |          | C     | Cyclopropane, Ethyl ether, Ethylene                                   |          |       |              |
|                |          | D     | Acetone, Benzene, Butane, Propane, Hexane, Paint solvent, Natural gas |          |       |              |
| DUST           | II       | E     | Magnesium, Aluminium, Conductive dust with R<10^9 Ohms/cm             | 20-21    | III C |              |
|                |          | F     | Coal  | 20-21-22 | III B |              |
|                |          | G     | Fleur, Conductive dust with R>10^9 Ohms/cm                            | 20-21-22 | III A |              |
| FIBER FLYINGS* |          |       | Cotton, Linen, Wood, Hemp   | 20-21-22 | III A |              |

div. 1 - when handled, manufactured or used  
div. 2 - when stored, handled but not in manufacturing process

### ATEX SAFETY DEVICES

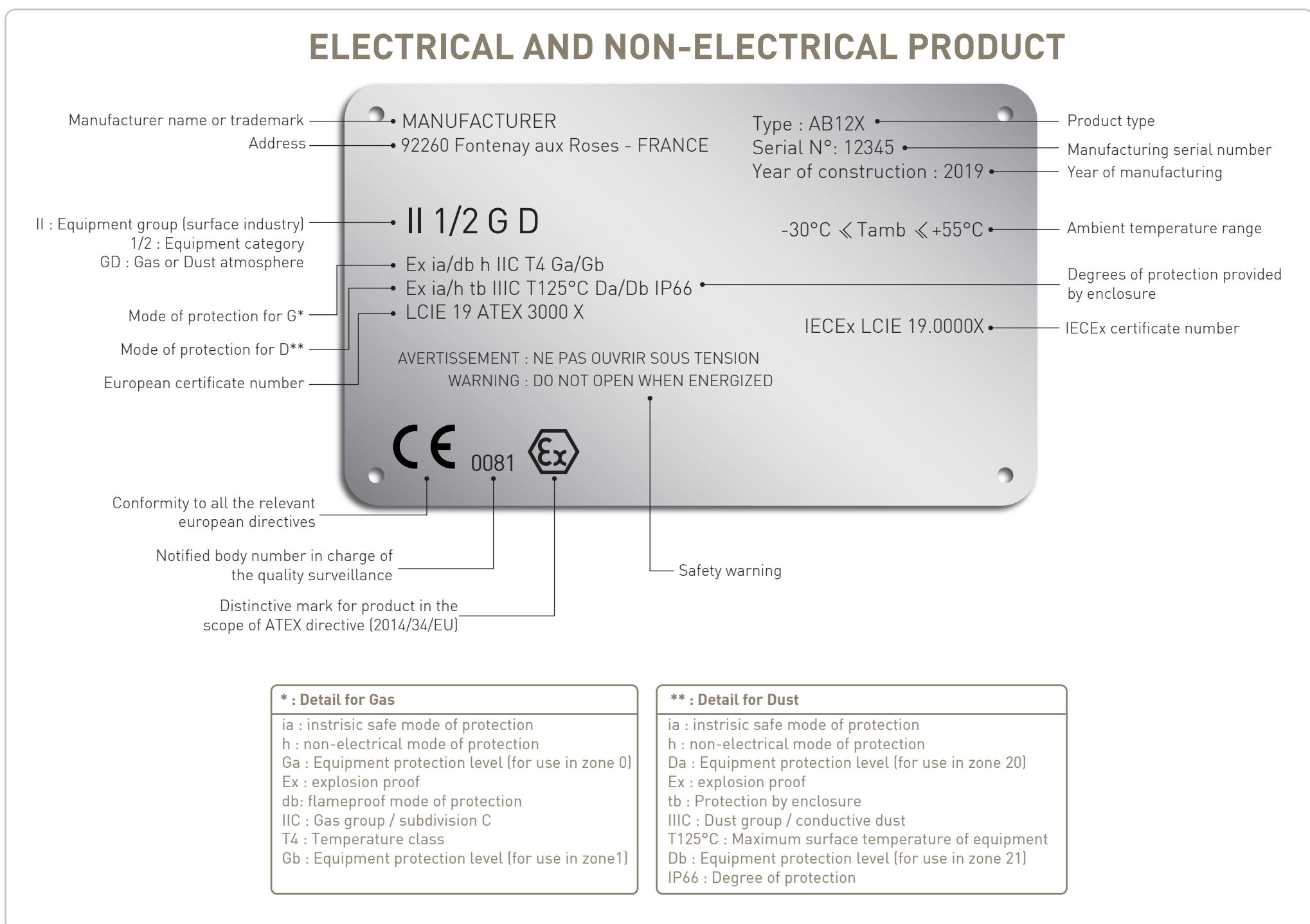
Application of EN 50495. Applies to safety devices operated outside or inside areas with explosive atmospheres.

| Zone of use of the EUC | Safety device ensuring the safety alone. Safety is ensured even if one fault occurs on the EUC. | Additional Safety device. Safety is ensured even if two faults occur on the EUC. |
|------------------------|---|--|
| Zone 0                 | HFT = 1 and SIL 2   | HFT = 0 and SIL 1  |
| Zone 1                 | HFT = 0 and SIL 1   | No requirement   |
| Zone 2                 | No requirement  | No requirement   |

## LCIE BUREAU VERITAS SERVICES

| CERTIFICATION SERVICES   | ACCESS TO LOCAL NATIONAL CERTIFICATION  |                               |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
|--|---|-------------------------------|-------------------------------|----------------------------|------------------------------------|-------------------------------------|-----------------------|--------------------|-----------------------------|-----------|-----------|---------------------|-----------------|--------|------------------------|-----------|
| <ul style="list-style-type: none"> <li>Product certification</li> <li>Audits</li> <li>Testing</li> <li>Storage of technical documentation</li> </ul>   | <table border="1"> <thead> <tr> <th>Country</th> <th>Documentation</th> <th>Local LCIE partner</th> </tr> </thead> <tbody> <tr> <td>China</td> <td>Chinese explosion proof certificate</td> <td>NEPSI / SIPAI / CCTEG</td> </tr> <tr> <td>Korea</td> <td>Korean national certificate</td> <td>KGS / KTL</td> </tr> <tr> <td>Brazil</td> <td>INMETRO certificate</td> <td>BV Brazil / NCC</td> </tr> <tr> <td>Russia</td> <td>TRCU certificate (EAC)</td> <td>NANO CCVE</td> </tr> </tbody> </table> | Country                       | Documentation                 | Local LCIE partner         | China                              | Chinese explosion proof certificate | NEPSI / SIPAI / CCTEG | Korea              | Korean national certificate | KGS / KTL | Brazil    | INMETRO certificate | BV Brazil / NCC | Russia | TRCU certificate (EAC) | NANO CCVE |
| Country  | Documentation   | Local LCIE partner            |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| China  | Chinese explosion proof certificate   | NEPSI / SIPAI / CCTEG         |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| Korea  | Korean national certificate   | KGS / KTL                     |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| Brazil   | INMETRO certificate   | BV Brazil / NCC               |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| Russia   | TRCU certificate (EAC)  | NANO CCVE                     |                               |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| <table border="1"> <thead> <tr> <th>TRAINING</th> <th>INSPECTION OF INSTALLATIONS</th> <th>QUALIFICATION OF REPAIR SHOPS</th> <th>QUALIFICATION OF PERSONNEL</th> </tr> </thead> <tbody> <tr> <td>Standard and customized training :</td> <td>Gap analysis program :</td> <td>Scheme for motors :</td> <td>4 levels program :</td> </tr> <tr> <td>FORMATAX</td> <td>ECARATEX</td> <td>REPARATEX</td> <td>QUALIFATEX</td> </tr> </tbody> </table> | TRAINING  | INSPECTION OF INSTALLATIONS   | QUALIFICATION OF REPAIR SHOPS | QUALIFICATION OF PERSONNEL | Standard and customized training : | Gap analysis program :              | Scheme for motors :   | 4 levels program : | FORMATAX                    | ECARATEX  | REPARATEX | QUALIFATEX          |                 |        |                        |           |
| TRAINING   | INSPECTION OF INSTALLATIONS   | QUALIFICATION OF REPAIR SHOPS | QUALIFICATION OF PERSONNEL    |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| Standard and customized training :   | Gap analysis program :  | Scheme for motors :           | 4 levels program :            |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |
| FORMATAX   | ECARATEX  | REPARATEX                     | QUALIFATEX                    |                            |                                    |                                     |                       |                    |                             |           |           |                     |                 |        |                        |           |

## PRODUCT MARKING



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