



BUSINESS PLAN

CEN/TC 433

Entertainment Technology

EXECUTIVE SUMMARY

Business Environment

- European business within the entertainment technology leads the world market and covers from 60 to 70% of the major projects, refurbishments and events.
- The safety of performing artists, the crew (technical personnel) and the audience are of paramount importance and numerous specific safety requirements are important and specific to the standardization of equipment.
- Often, untrained people are in charge of using machinery and equipment designed for the entertainment industry; global challenges, intense sequence of events or unforeseen contingencies may raise the demand of people with high level of responsibility and ((a)) professional approach.
- The entertainment industry has a large number of types of venues. Persons in theatres and the entertainment industry work together over Europe.
- A large number of systems are provided or rented for shows touring around different countries.
- Parties involved:
 - performing industry (theatre, production companies, musicians);
 - creative agencies (event agencies; concert promoters);
 - entertainment and event technology suppliers (manufacturers, service providers);
 - production venues (concert & convention halls, theatres, exhibition & event locations);
 - performers, technicians and licensing authorities as well as audience members;
 - theatre and stage engineering consultants;
 - Certification and testing authorities.

Benefits

- The main benefit will be to develop a set of standards for machinery, technical installations and work equipment used in the Entertainment Industry to simplify trade business and touring productions in different locations across Europe.
- Machinery used in this area is mostly within directive 2006/42/EG (machinery directive), but machinery intended to move performers during artistic performances (e. g. stage elevators) is excluded from this directive (Article 1, §2, (j)). Common and specific safety standards within Europe for both types of machinery use have to be ensured.
- In several EU member states different requirements and standards exist. Major theatre-building-projects in Europe refer to national standards which creates trade barriers over

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Date: 2022-08-09

Version: #4

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Europe. The standardization work in this field should help that all systems used within this industry fulfil the same minimum safety requirements and to harmonize the different existing national standards.

- Unlike other industries where the general approach in terms of H&S at work is to remove people from the hazard zone, in the entertainment industry – for artistic reasons – artists and performers are exposed to higher levels of risk for the sake of the “wow” effect. Therefore, the risk reduction approach and the recommended protective measures must be specific to such peculiar environment and commensurate to the industry.

Priorities

Creation of European Standards, Technical Specifications and Technical Reports on

- Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry.
- Design, manufacture and for use of aluminium and steel trusses and towers.
- Terms and definitions to be worked out as a result of standardization work in other Working Groups and clarification of terminology for CEN languages and translations.
- Codes of practices for competency requirements e. g. installation, safe use, maintenance, inspection and safe removal of entertainment technologies.

1. BUSINESS ENVIRONMENT OF THE CEN/TC

1.1. Description of the Business Environment

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

Entertainment technology is an interdisciplinary field with specific technology and unique safety requirements. There are places of assembly, staging and production areas for events and theatrical productions. Such locations include but are not limited to theatres, multi-purpose halls, exhibition halls, film, television, photography and radio studios as well as facilities in concert halls, museums, schools, bars, discotheques, open-air stages and other places for shows and events. In some cases, atypical non-performance spaces are also used. These “special event locations” require special attention.

The safety of performing artists, the crew (technical personnel) and the audience are of paramount importance.

These people have a right to expect that any entertainment production is safe and that people involved with the realization use reasonable care and judgment.

Numerous specific safety requirements are important and specific to standardization of equipment:

- Theatre stages and production areas are places where persons may be working under suspended loads without any personal protective equipment (PPE).
- Loads may be moved above unprotected persons and above persons who are not familiar with the situation.
- Loads are moved above non-restricted areas.
- Several types of loads may be moved simultaneously.
- Machinery and loads may be handled in darkness and with additional limitations of visibility (e. g. artificially created fog).
- Loads may be moved at high speed.
- Lifting systems, mainly in theatres and opera houses, may be used as stage elevators, orchestra pit elevators and traps for transports of persons and scenery. These lifting systems have similarities to elevators but move faster, in darkness, with reduced protective facility, requiring numerous persons to be transported.
- risks or hazards involved when operators are manipulating loads overhead.

The entertainment industry has a large number of types of venues. Persons in theatres and the entertainment industry in general work together across Europe. A large number of systems are provided or rented for shows, touring around different countries.

1.2. Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN /TC:

Figures (from Germany):

- in 2010/2011, over 32 mio. visitors in theatres and concerts with 67.755 events and a revenue of about Euro 2,8 billion;
- 143 public theatres, 218 privately owned theatres, 131 orchestra, 73 theatre festivals;
- in 2013, 3 mio. events with about 370 mio. participants in fairs and conventions;
- 3,3 billion revenue in 2012 with trade fairs;
- the live entertainment (concerts and live performances), exhibition, and convention market generates a total revenue of Euro 66,7 billion;
- entertainment industry members generate around 3,5 billion (VPLT members) in sales a year;
- the live entertainment market generates a total yearly revenue of Euro 3,322 billion.

Parties involved:

- performing industry (theatre, production companies, musicians);
- creative agencies (event agencies; concert promoters);
- event technology suppliers (equipment manufacturers, service providers);
- production venues (concert halls, theatres, convention halls, exhibition buildings, special event locations);
- logistics companies;
- performers, technicians and licensing authorities;
- audience members;
- entertainment technology suppliers;
- theatre and stage engineering consultants;
- certification and testing authorities.

2. BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

The main benefit will be to develop a set of standards for machinery, technical installations and work equipment used in the Entertainment Industry.

A set of technical standards within the entertainment industry will simplify touring productions in different locations across Europe.

Machinery used in this area is mostly within directive 2006/42/EG (machinery directive), but machinery intended to move performers during artistic performances (e. g. stage elevators) is excluded from this directive (Article 1, §2, (j)). The goal is to ensure common and specific safety standards within Europe for both types of machinery use.

In several EU member states, different requirements and standards exist. All major theatre-building-projects in Europe refer to their own national standards for technical equipment or standards of neighbour countries as UK, Sweden, Austria and Germany. Existing national requirements standards specify different safety levels which results in uncertainty and possible risks. This creates trade barriers over Europe.

The standardization work in this field should help that all systems used within this industry fulfil the same safety requirements and to harmonize the different existing national standards. With the standardization work, a harmonized use of machinery, installations and equipment within Europe can be achieved and this will remove technical barriers to trade and open markets throughout Europe.

3. PARTICIPATION IN THE CEN/TC

All CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

4. OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1. Defined objectives of the CEN/TC

Standardization activities include all machinery and technical installations used to lift, lower, suspend and carry loads (e.g. scenery, truss systems, lighting, film/video and sound equipment). They may also be used to move persons, and persons may stand under such equipment while the loads are at rest or in motion.

A first attempt for European standardization work was realized in CWA 15902-1 and CWA 15902-2. However, there are no existing common European or international safety standards regarding lifting and load-bearing equipment for stages and other production areas within the entertainment industry.

At the beginning, the work on CWA 15902-1 was the main topic with the aim to develop a European Standard, which has been achieved with EN 17206. In the future, a harmonized class C

standard associated with the machinery directive shall be established for this topic to ease conformity assessment procedure.

Working materials are part of or interface to machinery and need to follow the same or equal safety philosophy to guarantee safe interaction and shall be addressed as well within CEN/TC 433. Working materials in this content comprise elements for fastening, connecting and lifting as well as safety elements for portable light, image, sound and effects equipment.

Safety requirements for construction, installation and advice for safe use as well as load assumptions, testing and inspection of machinery and equipment shall be established and are an essential part of the standardization work within CEN/TC 433.

Another task of standardization shall be the application of existing general standards within the entertainment industry. This might be achieved by developing specific entertainment technology standards.

Another task will be to establish a common standard of safety that can be applied and verified by an internal validation after performing the necessary tests in the same area of the event.

Finally, codes of practice for operators and aspects of safety for flying systems for artists shall be established.

4.2. Identified strategies to achieve the CEN/TCs defined objectives.

A structure with three working groups is established, dealing with the specific technical matters in the entertainment industry. These three working groups are dealing with.

- Machinery (WG 1);
- Work equipment and installations (WG 2);
- Codes of practice (WG 4)

A fourth working group dealing with the terminology in the entertainment industry is foreseen.

4.2.1. WG 1 Machinery

4.2.1.1. Published documents

- EN 17206:2020+A1:2021
Entertainment technology - Machinery for stages and other production areas - Safety requirements and inspections

4.2.1.2. Work programme (currently active and preliminary projects)

EN 17206-2, *Machinery for stages and other production areas – Part 2: Safety requirements for stands and truss lifts of stands*

Based on national document(s):

- DIN 56950-3, *Machinery installations – Part 3: Safety requirements for stands and truss lifts of stands*

4.2.1.1. Future work

EN 17206-3, *Machinery for stages and other production areas – Part 3: Unmanned aircraft systems (UAS) for stages and other production areas — Safety requirements and inspections*

EN 17206-4, Machinery for stages and other production areas – Part 4: Safety requirements for serially manufactured projection screens

Based on national document(s):

- DIN 56950-4, *Machinery installations – Part 4: Safety requirements for serially manufactured projection screens*

Machinery of movement of fire curtain barriers, smoke hedges and dividing doors

Based on national document(s):

- OENORM M 9630-4, *Mechanical equipment on stages — Part 4: Mechanical devices for fire safety*
- DIN SPEC 56951, *Entertainment Technology - Drives and control systems for safety-related equipment*

4.2.2. WG 2 Work equipment and installations**4.2.2.1. Published documents**

- EN 17115:2018
Entertainment technology - Specifications for design and manufacture of aluminium and steel trusses

4.2.2.2. Work programme (currently active and preliminary projects)**FprEN 17736, Entertainment technology — Specifications for design and manufacture of Aluminium stage decks and frames**

Based on national document(s):

- DIN 15921, *Entertainment technology — Aluminium platforms and frames — Safety requirements*

4.2.2.3. Future work**Mechanical equipment for lifting and suspending purposes**

Based on national document(s):

- DIN 15922, *Entertainment technology - Fastening points and fixtures for work equipment*
- DGUV Information 215-313, *Overhead loads*

Safety ropes for loads attached to load carriers

Based on national document(s):

- DIN 56927, *Entertainment technology — Safety-rope to secure objects up to 60 kg self weight — Measures, requirements and testing*
- NPR 8020-15, *Entertainment - Rigging - Safety ropes for loads attached to load carriers*

Loads and load assumptions - safe working load - live load - traveling load

Based on national document(s):

- DIN 56955, *Entertainment technology — Load assumptions in stages and associated areas — Safe working loads*
- NPR 8020-51, *Events — Stage structures — Loads and structural keynotes*

Technical ceilings and grids

Based on national document(s):

- DIN 56928, *Event technology — Technical ceilings and grids — Safety requirements*

Fixing and connecting elements, transition pieces for projectors, luminaires and stage equipment (TV-Lighting Spigot Eurospec)

Design specification and test of harnesses and accessories intended for moving performers during artistic performances

Based on national document(s):

- NPR 8020-11, *Entertainment — Rigging — Manually operated flying systems for persons*
- UNE 311001, *Entertainment — Rigging — Manually operated flying systems for persons, General requirements*
- BS 7905-1, *Lifting equipment for performance, broadcast and similar applications. Specification for the design and manufacture of above stage equipment (excluding trusses and towers)*, Chapter 9
- DGUV Grundsatz 215-320, *Work equipment for scenic movement of persons*

4.2.3. WG 4 Codes of practice

4.2.3.1. Published documents

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4.2.3.2. Work programme (currently active and preliminary projects)

prEN 17795-5, *Entertainment Technology – Codes of Practice - Part 5: Lifting and motion Operations in the Event Industry*

EN 17795-3, *Entertainment Technology– Codes of Practice – Part 3: Performer Flying Operations* (in preparation)

4.2.3.3. Future work

EN 17795-1, *Entertainment Technology– Codes of Practice – Part 1 – General requirements*

EN 17795-2, *Entertainment Technology– Codes of Practice – Part 2 – Load carrying devices*

EN 17795-3, *Entertainment Technology– Codes of Practice – Part 3 – Load bearing equipment*

EN 17795-4, *Entertainment Technology– Codes of Practice – Part 4 – Temporary demountable structures*

EN 17795-6, *Entertainment Technology– Codes of Practice – Part 6 – Performer flying*

EN 17795-7, *Entertainment Technology– Codes of Practice – Part 7 – Lifting accessories*

Based on national document(s):

- UNE 311002:2020, *Entertainment industry – codes of practice for the use of equipment for lifting and suspending loads on stages and other production areas*
- OENORM M 9631, *Mechanical equipment on stages — Operating and maintenance instructions*
- OENORM M 9633, *Event equipment — Cross arm systems — Provision, use and testing*
- NPR 8020-11, *Entertainment — Rigging — Manually operated flying systems for persons*
- BS 7906-2, *Lifting equipment for performance, broadcast and similar applications. Code of practice for use of aluminium and steel trusses and towers*

4.2.4. WG 3 Terminology (foreseen)

Standard for Terms and definitions

Overall standard to be worked out as a result of standardization work in other Working Groups and clarification of terminology for CEN languages and translations.

After publication of the first relevant European Standards, a review of the Terminology shall be made and the possibility to establish a dedicated Working Group on Terminology shall be checked.

4.2.5. Potential future topics within the TC

a. Temporary and mobile electrical systems

Existing documents in Europe for this topic are:

- DIN 15700, *Entertainment technology - Mobile equipotential bonding systems*
- BS 7909, *Code of practice for temporary electrical systems for entertainment and related purposes*
- DIN 15901, *Entertainment technology - Two-pin connectors for stage lighting*
- DIN 15765, *Entertainment Technology - Multi-core cable systems for mobile productions and entertainment technology*

b. Fire classification for materials used in the entertainment industry

c. Media systems

Media systems within Entertainment industry. E. g. control protocols, lighting systems, audio systems, video systems, data connectors and cabling

4.3. Liaisons

Liaisons should be established with the following CEN/TC and other organizations for collaboration:

- CEN/TC 10 "Lifts, escalators and moving walks"
- CEN/TC 98 "Lifting platforms"
- CEN/TC 135 "Execution of steel structures and aluminium structures"
- CEN/TC 147 "Cranes – Safety"
- CEN/TC 152 "Fairground and amusement park machinery and structures – Safety"
- European Federation of Materials Handling (FEM)
- ASD-STAN/ D 05/WG 8, UAS Unmanned Aircraft Systems (Domain D05 Autonomous Flying)

4.4. Environmental aspects

As every product and every test method has an impact on the environment during all stages of its life cycle, there is a need to reduce any potential adverse impact by taking into account environmental issues in standards. It is therefore necessary to understand how the product interacts with the environment during its life cycle, including emissions to air, discharges to water and soil.

CEN/TC 433 should take into consideration:

- the precautionary principle and
- environmental and human health protection and safety aspects

whenever a new standard is drafted or an existing standard is revised or intended to be revised.

Furthermore, at any stage in the standard development process, experts are encouraged to include environmental issues in their comments.

Standards should include processes, practices, techniques, materials and products to avoid, reduce or at least control the creation, emission or discharge of any type of pollutant, or waste in order to reduce adverse environmental impact.

For example, hazardous, toxic or otherwise harmful substances and materials described in standards should be substituted by other less harmful substances and materials whenever possible and feasible.

In the process of developing standards; the precautionary principle will be taken into account by focusing on options and solutions rather than on risk.

The integration of environmental aspects into product development can also be considered involving material reuse, recycling and recovery at end of life. Especially aspects related to the use of machinery with internal combustion engines in indoor enclosures will be considered.

CEN/TC 433 should develop robust and properly validated standards while recognizing the limitations of existing scientific capacity and knowledge to identify potential impacts. In order to take account of the diversity of products and their specific environmental impacts as well as the need for relevant environmental knowledge. CEN/TC 433 should try to make every reasonable effort to invite environmental experts to participate in the work.

5. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME

Due to different existing national standards, finding quick consensus may be difficult and a longer period for discussion might be necessary.