Project CONFORT 200
GUIDANCE FOR OPERATOR ACCORDING EN 45545

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EN 45545 series

- Part 1: General **2013**
- Part 2: Requirements for fire behavior of materials and components **2016**
- Part 3: Fire resistance requirements for fire barriers **2013**
- Part 4: Fire safety requirements for railway rolling stock design **2013**
- Part 5: Fire safety requirements for electrical equipment **2015**
- Part 6: Fire control and management systems **2013**
- Part 7: Fire safety requirements for flammable liquid and flammable gas installations **2013**

- Does requirement mention a fixed Version of the EN 45545?
  - *EN 45545-2 new release 08/20 available*

EN 45545 – aim over all

The measures and requirements specified in EN 45545 are intended to protect passengers and staff in railway vehicles in the event of a fire on board.

The ultimate objective in the event of a fire on board is to allow passengers and staff to evacuate the railway vehicle and reach a place of safety.

Part 1, 2, 3, 4, 5, 7	Passive fire protection
Part 6	Active fire protection

EN 45545 Part 1: General

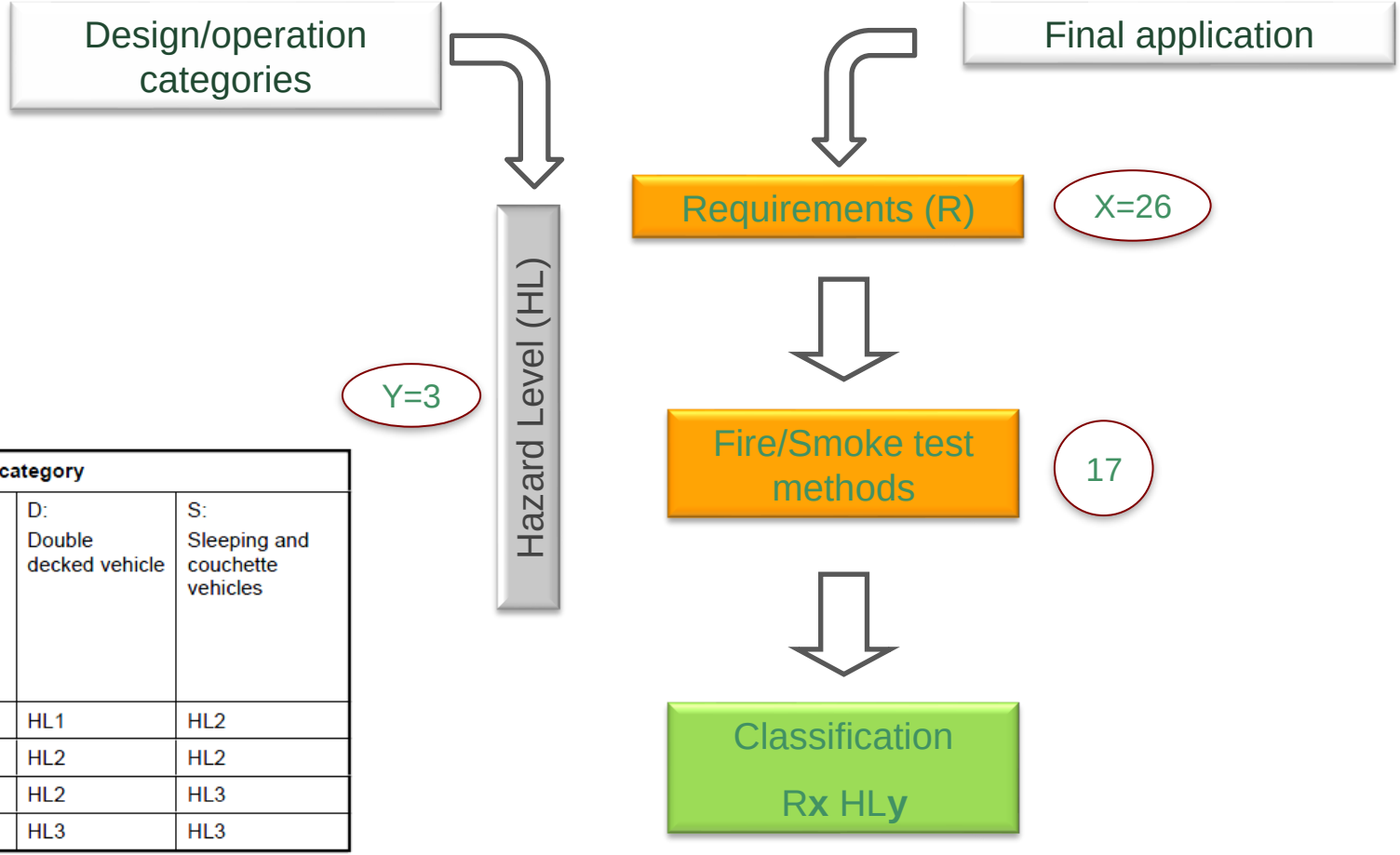
- Mainly definition of the operation category
- HL Category has been defined by the operator
- Design category has been defined by operator
- Operational concept regarding running time necessary

EN 45545 Part 2: Requirements for fire behaviour of materials and components

- Most extensive part of the standard: 26 requirements, associating 17 fire tests
- HL definition determined by operator
- Nearly every component of the vehicle has to be considered
- Note the general rules and the grouping rules
- Test Reports (also classification reports) from accredited testing institutes are required (note: data sheets as evidence are not permitted)
- the creation of a detailed material table is recommended

EN 45545 -2 :

Requirements / Testing methods



	Design category			
Operation category	N: Standard vehicles	A: Vehicles forming part of an automatic train having no emergency trained staff on board	D: Double decked vehicle	S: Sleeping and couchette vehicles
1	HL1	HL1	HL1	HL2
2	HL2	HL2	HL2	HL2
3	HL2	HL2	HL2	HL3
4	HL3	HL3	HL3	HL3

EN 45545 Part 2: Requirements for fire behaviour of materials and components

- Module
- Component
- Exact structure of the component
- Requirement according to EN 45545-2 (setpoint)
  - Result according to EN 45545-2 (actual value)
- Verification with link (e.g. test report with test institute, report number and date)
  - Exposed area
  - Flammable mass
  - Calorific value
  - Resulting fire load

Part 3: Fire resistance requirements for fire barriers

Identified areas according to table 1 (e.g. underfloor technical cabinet)

Test according to EN 1363-1

- +EN 1364-1
- +EN 1364-2

Note: Important for the test sample(s) is to consider all penetrations an the surrounding structure

Part 4: Fire safety requirements for railway rolling stock design

- Main Headline: Evacuation and escape
- Critical Situation: Evacuation through train end door(s)
- EN 50553 only applicable for operation category 3, but

  Running capabiltiy in case of fire is also important for operator

Part 5: Fire safety requirements for electrical equipment

Regarding cabling and overload protection it is recommended to provide a list with the following details:

- Electrical Circuit
- Electrical voltage
- Electrical consumer (power)
- Cable used (cross section)
- Installation space
- Electrical fuse

Part 5: Fire safety requirements for electrical equipment

Two main ignition sources out of history:

- High Power Cables (Connections)

  e.g. incorrect clamping points

- Heating equipment

  e.g. wrong or missing thermal fuse

Part 5: Fire safety requirements for electrical equipment

-All the electrical equipment shall be designed and installed in such a way that its integrity is ensured until no longer required for evacuation-

Instead of using EN 50200 qualified cables also another method of laying the cables can be considered (e.g. outside the car in a steel pipe or inside the car redundant and geometrically far away from each other)

The (time) requirements for this purpose result from the operating, failure and evacuation concept.

Part 6: Fire control and management systems

Fire alarm system

Monitoring of all relevant areas is necessary to ensure reliable detection.

EN 45545 in Part 6 may not cover all areas, and there are no detailed requirements.

ARGE Guidelines are known as practicable standard for verifying the positions of the detectors and the system functionality.

Part 6: Fire control and management systems

After a fire detection, the control system of the fire alarm system shall initiate all necessary activities to ensure a quick and safe opportunity to reach the next evacuation point.

Part 6: Fire control and management systems

Fire extinguisher

Important principles are:

- The fire extinguishers in the vehicle must be easy to find and their operation self-explanatory.

- Fire extinguishers of category AB (foam) are recommended.
- Fire extinguishers of category ABC (powder) should be avoided.
- CO2 fire extinguishers are not recommended.

Part 7: Fire safety requirements for flammable liquid and flammable gas installations

There is no indication for the use of flammable liquid or flammable gas installations.

Questions ?