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Shri G.S. Institute of Technology and Science, Indore
Standards Writing Competition
STANDARD CLUB DEPARTMENT OF MECHANICAL ENGINEERING

Title..... HELMET.....

Group Number..... 1.....

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TOPIC - HELMET

Scope → It should cover the head properly.

- Better visibility
- Better comfort
- Proper ventilation
- Hazard features

References :- IS 4151-2015, weight of helmet should be under 1500 grams.

→ As per SFI certified, helmet should resist heat for upto 10 minutes.

→ Visor should be made of toughened material and scratch resistant.

3. Definitions, Terminologies.

- ① structure ② padding ③ visor
④ safety lock ⑤ ventilation.

①^a structure: structure is defined as the closed entity which surrounds or covers the rider's head without affecting its visibility. ~~and~~

②^b padding: padding is defined as the cushioning which is provided in order to protect driver's head by reducing impact during collision.

- It should provide comfort.
- Sweat absorption / Breathable materials.
- Anti-Bacterial qualities.
- Damping properties (impact)

③^c visor: → visor is a transparent shield.
→ whose sole purpose is to protect driver's face and provide visibility.

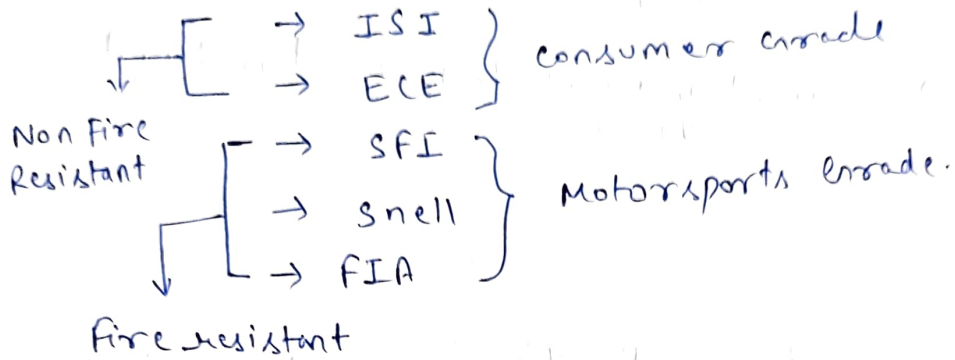
④^d safety lock: - It is the lock which is used to hold helmet tightly with the rider's head.

- It should be easily applicable. (Quick release).
- It should not open during collisions.

5) ventilations :- proper Air Circulation,
& driver can breathe properly.

4) Crashes, Types and classes.

Crashes



Types :-
→ open face
→ closed face
→ ATV Type
⇒⇒ Safety HELMET
→ closed face motorsport

classes

class - I :- It should take impact of 500N
→ Rucke collision under 60km/hr.
→ proper visibility.
→ open and close style (Available).

class - II :- It should have Hazard features.

Resist
→ Impact collision upto 2000N

→ Fire resistant material

→ closed face only.

→ speed rating upto 150km/hr.

class-III :- → Rated upto 250 km/hr.

→ Impact rating 5000 N

→ fire resistant upto ~~10~~²⁰ minutes.

→ Inbuilt safety and emergency features

→ Two layers of toughened material.

5. Manufacture:

→ It should be made from pressure die casting.

→ It should be made from the moulding process.

⑥ Requirements.

characteristics

Structure :- → Lightweight less than 1500 grams (consumer grade)

5000

→ strength to weight ratio should be high.

→ Material should have high toughness and stiffness.

→ Scratch resistant

→ Shock Dampening.

→ Use of Radium strips and Hazard Accessories

AR/PR

visor → → Toughened (not brittle material)

→ B promotes better visibility.

→ Scratch resistant

→ fire Resistant

→ Anti fog characteristics.

Safety lock :- → It belt strength should be high.

→ Non tearable

→ Non-flammable

→ Mechanism should be quick release

Padding :-

It should consist of three layers of material.

(a) Shock absorbing material (Layer-1)

(b) Two layers of comfort fabrics

Soft cushioning (Intermediate Layer)
(Nomex layer)

(c) Inner most layer should have Anti bacterial and sweat absorbing feature.

(d) Nomex layer should be present between structure and padding layer in class-II and class-III.

⑦ Sampling : Destructive Testing should be performed.

Lot of 10 helmets is made and 10 helmets at random should be taken and at least 9 of them should pass the test. Then the lot is accepted.

⑧ Methods of Tests

Structure:

Destructive testing

Impact Tests

fire resistant test.

Hardness test (Rockwell)

UTM Test.

visor:

fire resistant

scratch resistant (Boinell test)

Bending test

safety lock :-

Tensile test of strap.
compressive test of lock.
fire Resistant.

⑨ packing :- It should be properly Bubble wrapped along with the side foam.

⑩ Marking :- Manufacture Mark
Test Mark
Certification Mark.