

Contest *Electronic Sensor for Saber, ED – 19*

1. General

ED - 19 is an international contest for the development of the electronic sensor for hits in saber.

The FIE will organize an open international contest, *ED- 19*, for the development of the electronic sensor in saber fencing.

Commission:

1. Member of the FIE COMEX: Bierkowski, Jacek (Head of the Commission)
2. President of the FIE SEMI Commission: Rikhtman, Semen
3. Member of the FIE SEMI Commission: Giandomenico Varallo
4. Member of the FIE Rules Commission: Medhat El Bakry
5. Member of the FIE Refereeing Commission: Chang Gon. Kim
6. Member of the FIE Coaches Council: Tyschler, Gennady
7. Member of the FIE COMEX: Szabo, Bence
8. FIE Sport and Technical Director: Tsukhlo, Evgeny

2. Objective

- The contest objective is to design and manufacture a modern sensor for registering, with high reliability, hits in saber fencing.
- The sensor should be easy to operate, not expensive and ready for use beginning in the first round of preliminary competitions in saber fencing.
- The components of the sensor system should form part of the fencer's individual equipment that will be used in the course of bouts.

3. Contest Regulations

- The FIE will post an invitation to tender on the FIE website and some other media.
The FIE will set up a commission responsible for accepting and appraising sensor prototypes.
- The contest will run for 1 (one) year from the date the FIE issued a call for it.

- Participants shall, within 2 (two) months, send the FIE a sealed envelope with the description of the sensor system's operating principles so as to prevent disputable situations.

4. The contest shall consist of 2 phases:

Preliminary phase: 2 (two) months

- During the prototype testing period, the FIE Contest Commission will open the sealed envelopes with the description of the sensor system's operating principles.
- Upon completion of the preliminary phase the FIE Contest Commission will select the most promising prototype, make additional tests and announce the winner of the preliminary phase.
- Within two subsequent months the winner shall manufacture at its expense 8 sensor prototypes to continue tests.

Final phase: 8 (eight) months

- The FIE will conclude an agreement the winner of the preliminary phase for making the required number of sensors for both test and official events.

Such agreement shall comprise:

- Definition and technical characteristics of the sensor system.
- The technical characteristics shall have clear definitions in terminology. They shall be clearly defined with tolerance limits and use standard SI units with the explanation of desired outcome.

The general description shall be replaced by agreed and reproducible criteria.

5. Contest results

- The FIE Contest Commission will check and confirm the results of the test events and the official events where the saber sensor was used. The

Commission will also check that the technical specifications of the Contest and the criteria of the second phase were respected.

- The Contest Commission will then submit the results of the contest “Electronic sensor for saber ED – 19” and if applicable, propose a winner to the Executive Committee.
- The FIE Executive Committee will examine the proposal of the Contest Commission and if applicable will declare a winner, who will receive a reward of 50.000 CHF.

6. General Technical Requirements for the Development of the Saber Sensor

- The system should register hits in saber with 99.9% ultimate reliability (according to the applicable FIE Technical Rules (t.96 and Appendix «B») and the FIE Material Rules.
- The system’s sensitivity threshold should allow for the adjustment of the sensor to meet necessary requirements for the registration of hits in the fencer’s target area (mask, electric jacket, electric glove) as circuit closing. It is not specified how this circuit should be closed.
- The touch - that’s means a touch can be scored with a thrust (like in epee and foil), with the upper or lower edge or with the flat of the blade, as allowed by the current system.
- The duration of a contact with the target area to ensure that a scoring apparatus emits a signal should be 0.1-1.0 ms.
- The system and all of its components should be small in size (overall dimensions: (no more 25 mm x 25 mm x 20 mm) and weight (max. 20 g), they should be located in the inner protected space of the guard and replace a two-pole socket. The sensor and all of its components should have a socket for connecting with the body wire plug and a battery recharging port.
- The system should operate continuously for 15 hours. The battery charge level should be visible. The sensor battery should be easy of access and allow for quick dismantling and replacement.
- The system should be capable of preventing hit registration in saber fencing in the event of a “wrong” contact with the target area.

- The sensor should allow for the demonstration of operating parameters, as well as for rapid checkout using a built-in port, but it should render impossible any unsanctioned external attempt at interfering in the setting of the system's parameters.
- The system should be protected from any external interference (TV, Internet, video, radio, etc.).
- The sensor should be reliable enough to allow for a rapid identification of any malicious interference in the operation of the equipment.
- A minimum of 8 (eight) production prototypes should be produced by the company that has won the first phase of the tender within 2 (two) months from the announcement of its results by the FIE (the compliance with the Technical Specifications should be no less than 85%).
- The primary function of the system should enable hits to be registered in the "competitions" mode and should be directly connected with the FIE-certified scoring apparatus. It should also allow for the registration of hits in the "training" mode (minor product feature).
- All the equipment such as the weapon (saber), mask, gloves, electric jacket, body wire, mask wire, which is used with the sensor, should meet the requirements as set forth in the FIE Material Rules.
- The system should not affect the requirements imposed on the competition safety. All the changes in the equipment should be approved by the FIE.
- The system should make it possible to use 24 pistes at a time for competition bouts. No additional adjustment should, if possible, be required when moving from one piste to another.
- The system should operate in a safe and reliable manner under climatic and temperature conditions as specified in the FIE Organizational Rules and the FIE Medical Handbook and in various structures/rooms with due regard for fencers' equipment and specifics of the use of scoring machines.
- The system should allow for the Bluetooth/wireless connection.
- The system should allow self-assessment for troubleshooting purposes.
- The system should not require any special licenses for its operation during competitions in various countries. All the necessary safety certificates should be in place.

- The seller should disclose any national or international patents that may be involved in the development of the sensor. This includes all the provisional and nonprovisional patents and applications that are currently in use.

Annex: Contest Application Form

Member of the FIE COMEX: Bierkowski, Jacek

President of the FIE SEMI Commission: Rikhtman, Semen

FIE Sport and Technical Director: Tsukhlo, Evgeny