Equipment Control FIS Cross-Country World Cup

Date: ~~May~~ September 2026

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1 General Information

1.1 Testing method

- Fourier Transform InfraRed (FTIR) Spectroscopy.
- Find more information about the instrument and calibration model HERE

1.2 Data storage

- All testing data will be collected and stored in the FIS database.
- Data will not be shared with 3rd persons.

1.3 Location of the test

- Finish area, as close as possible to the Finish.
- Detailed location and set up will be coordinated with the LOC Chief of Competition.

1.4 Testing scope

- Primary goal is to test all skis of all athletes.
- Due to time constraints in some competition formats and techniques random number of skis will be tested.
- The amount of athletes/skis will not be communicated by the Jury after the competition.

1.5 Infrastructure for the test

1.5.1 Tent for testing

- Provided by FIS.
- Restricted access (FIS Equipment Controller, Jury, LOC testing personnel).
- Size 6 x 3 m.

1.5.2 Equipment for the tent

Provided by LOC:

- Rubber floor (or any other stable, hard and not slippery floor).
- Furniture:
    - Tables – 4pcs (Size: 2.50 x 0.75 m)
    - Chairs – 4 pcs
- Electric heating (not a blower)
- Reliable electric power source
- Wooden ski racks – provided by LOC (Sprint formats)
- Ski racks with bib numbers
- Example/technical specification – in separate document
- Ski storage should be protected against sun, wind, rain and snowing BEFORE the competition only (roof and some side walls, but no heating)

1.6 Testing setup

- Fenced off area
- Restricted access
- Jury + FIS staff
- Team technicians
- Space for ski storage for all athletes in the pre-start “if applicable”

- Depending on the technique and format
- Example for 90 athletes:
  - Interval Start Free – 90 pairs
  - Skiathlon/Mass Start C Ski exchange – 180 pairs
- Control by FIS officials to check if all skis are in the position before the ski delivery time
- Each ski will be place by the technician/athlete in the correct rack.

2 Testing logistics

2.1 Before Competition

2.1.1 Ski marking

- All competition skis for the race must be marked with a sticker
- Sticker will contain:
  - Bib number
  - Number of the pair
  - Number of the ski
- Stickers will be provided to all athletes before the season.
- Each athlete will get a certain number of stickers, to be used during the season.
- Number of stickers/athlete according to the table:

Athlete's ranking	Amont of sticker
TOP 30 in Sprint, Distance or Overall Standing	25
From top 30 to top 60 in the Overall Standing	15
Over Top 60 in the Overall Standing	10

- If needed, more stickers can be provided.
- Without the sticker, skis cannot be checked in.

2.1.2 Skis delivery

As a general principle, pre-race Fluor Tests will not be organized during the winter season 2026/27. Athletes can come straight to the start with their skis.

In Skiathlon and Mass Start events with ski exchange, competitors must place their second pair of race skis in the pit box no later than five minutes before the start.

IMPORTANT: For the purpose of the post-race fluor test, all competition skis must be marked with FIS stickers.

However, at the discretion of the Equipment Controller and FIS Staff, pre-race random tests may be conducted as previously established. Decision about the pre-race test will be announced at the TCM before the competition. If pre-race tests take place, they will be based on the following principle:

- Skis must be delivered to the test area "**Fluor – Race ski pick-up**" latest at the defined time.

CLASSIC AND FREE TECHNIC	Interval start/Mass Start/Pursuit/Sprint*/Team Sprint/Relay	-1 pair of ski (Athlete's number sticker)	-15 Minutes before the athlete start
	Skiathlon /Mass start with ski exchange	-1 pair of ski (Athlete's number sticker)	-First Pair 20 minutes before the athlete start
		-1 pair exchange (Athlete's number sticker)	-Ski Exchange 5 minutes before the start of the competition
*Sprint CLASSIC heats		-2 pairs (2) of ski (Athlete's number sticker)	-15 Minutes before the athlete start

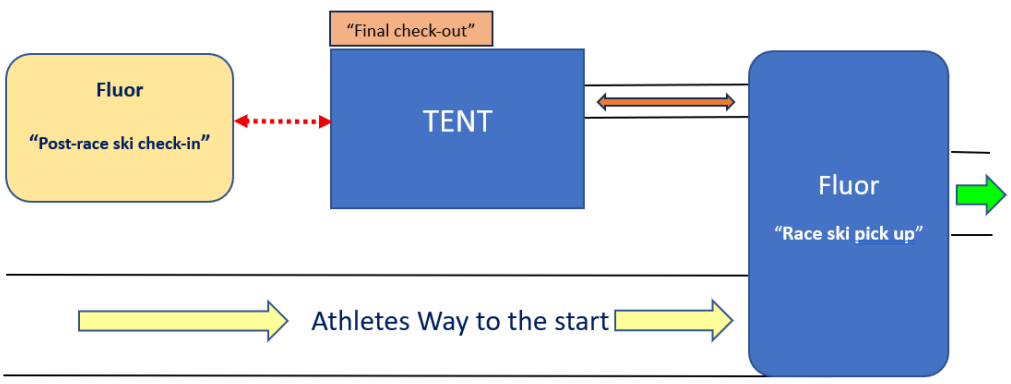
- The technician/athlete personally put the skis in the designated rack.
- No interaction by a steward.
- Skis are tested in the tent.
- Athletes can collect skis from 5 min before the start of the competition, in Mass-start.
- Athletes can collect skis from 5 min before the start of the competitor, in interval start.

If pre-race random testing is not organized, competitors must comply with the ski pair limits per format outlined in the table above.
The FIS team is committed to informing teams as promptly as possible to ensure that no team is penalized. The deadline for informing teams is set at the pre-race TCM.

2.2 After Competition

- Right after the competition skis must be delivered by the athlete or volunteers to the "**Fluor - Post race ski check-in or drop-off**" Zone.
- No interaction by a volunteer.
- Skis are tested in the tent.
- After the skis have been tested, they will be placed in the "**Fluor - Final check out**" Zone.
- Exchange skis from the pit boxes will be collected:
  - During the competition by the Fluor team for skiathlon delivered to the test station directly
  - After the competition by the Fluor team for Mass start with ski exchange delivered to the test station directly.

2.3 Example of a Fluor area



3 Red ski

- For the definition of “red ski” see further
- When a ski is “red” the team staff will be directly informed by the Equipment Controller.
- A maximum amount of three people (athlete include) can come to the “**Fluor - Control area**” to collect the racing ski
- The Equipment Controller will show the different tests measurements from a screen that.
- No subsequent measurements by team’s testing instrument will be considered when the “red ski” ski leaves the “fluor test tent”.

4 Specific format.

4.1 Individual Sprint

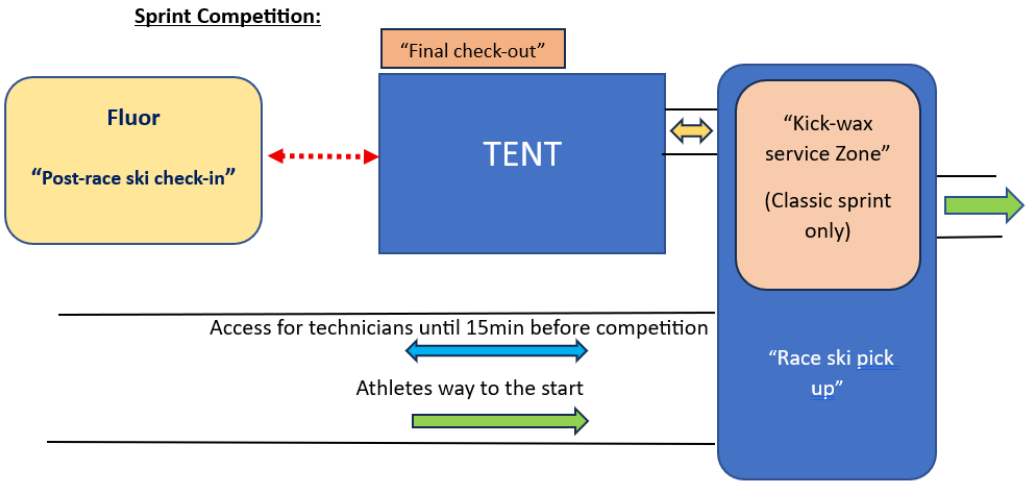
4.1.1 Sprint

Finals:

- Number of competition pairs:
  - Free technique: One (1) pairs/athlete
  - Classic technique (*): Two (2) pairs/athlete
    - Each ski must be marked and signed with the sticker
    - The second pair must be delivered to the “race ski pick-up” no later than the start of the athlete's semifinal.
- Skis of eliminated competitors will be tested after their last round.
- Skis of competitor who have been qualified will be delivered back to the “Race ski pick-up” at the start.
- Skis of competitors in the final will be tested after the final.

Classic technique:

- During the heats of a Sprint Classic competitions, adjustments to the kick wax between the rounds is allowed from quarter finals. Adjustment must be made by the competitor or authorized personnel within the designed Control Area.
- Only the kick zone can be adjusted by team technician in the “**Fluor - Kick wax service**” zone.
- Only technicians (no coaches, physio, etc.) can access the “**Fluor - Kick wax service**” zone.
- List of material allowed in the “**Fluor - Kick wax service**” zone:
  - Wax tables - Ski’s profiles – wax machines - Heats guns (battery) and Gaz guns – Corks - Metal’s Spatulas – Scrapers - Grooves and Pencil grooves - Kick-Wax – Klisters - Tape-Wax – Tapes - Sandpapers - Dry paper or Fiberlene for cleaning tools.
  - “Sprays”, “liquids” and “glide-wax” are forbidden in the “**Fluor - kick wax service**” zone.
  - In case a tool or equipment not listed above is intended to be used, the request must be done latest 1 hr before the TCM of the sprint competition to the FIS Race Director. Requests after this deadline will be automatically denied.
- From Semi-finals, after the kick zone has been adjusted, team technician must deposit skis in the designated rack with athlete number in the “**Fluor - Race ski pick up**” zone.
  - Both pairs must be put in the “**Fluor - Race ski pick up**” zone, the unused pair cannot stay in the “**Fluor - Kick wax service**” zone.
  - Team staff can only deposit skis and not stay in the “**Fluor - Race ski pick up**” zone.
  - Athlete will collect the skis directly before the start of the Semi-finals and Final in the “**Fluor - Race ski pick up**” zone.
- LOC officials will control the area.
- Adjustment of glide zones is not allowed.



5 Measuring procedure

5.1 Personnel and responsibilities

5.1.1 FIS Equipment Controller

- Directly involved and responsible for the organization of fluor testing before and during the event.
- Responsible for smooth flow of the fluor testing on site.
- Responsible for selecting athletes to be tested before competition in accordance with the Jury.
- Responsible for selecting athletes to be tested in the finish area in accordance with the Jury.
- The only person to communicate with the Jury and FIS Race Director about NPS or DSQ.
- Collects information from teams and SRS about development in ski waxing, to develop the testing protocols.

5.1.2 Jury

- Receives information from the FIS Equipment Controller.
- Makes final decision about sanctions.

5.1.3 Testing personnel from LOC

Testing station (total number of testing stations is 4)

- 1+1 testing operator and assistant per stations– provided by LOC/NSA.

Check-in/after test

- 3 volunteers
- 2 persons responsible for:
  - Organisation of ski storage BEFORE the test.
  - Controlling the ski delivery time of each athlete.
- 1 person responsible for:

- Organisation of ski storage AFTER the test.

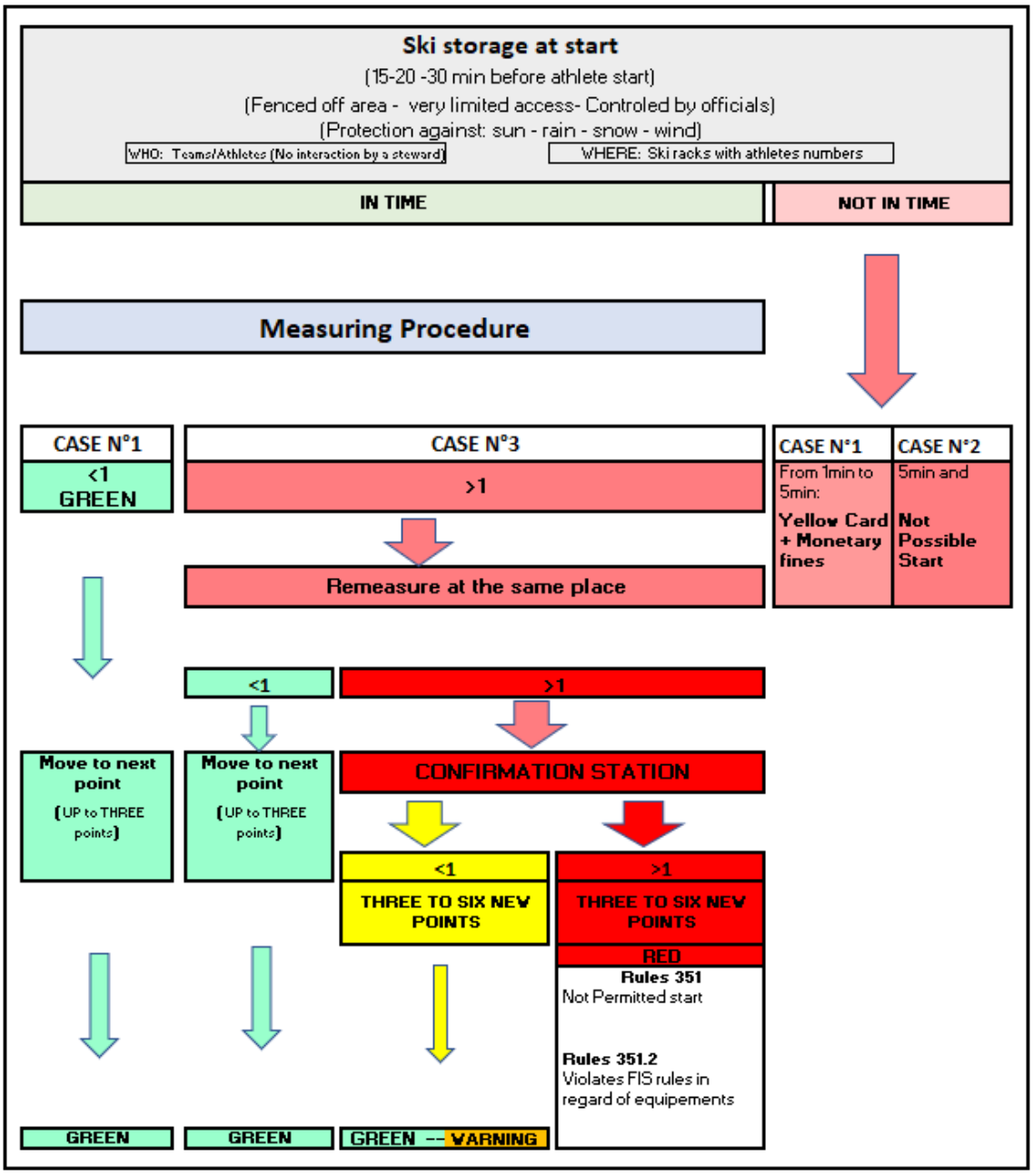
Waxing control for individual classic sprint

- 2 persons to control that only kick zone is adjusted in the "**Fluor - kick-wax service** "zone.
- Responsible for monitoring no waxing is done after athlete's quarter final.
- Exception – classic technique competitions (see further).

5.2 Number of testing instruments

- Normally, there will be from 2 to 4 instruments on the FIS Cross-Country World Cup.

5.3 Measuring procedure



The model is also set up to instruct the controller to conduct small brushing 2cm^2 when needed, based on the shape of the full spectrum.

- **Ski will be considered RED when the 3 measured points in the confirmation station are RED.**