



RECOMMENDED CHRONOGRAPH PROCEDURES

The method for testing ammunition for the PA matches and for the Rapid Fire match at the PA/ISSF National Championships will be as follows.

Setting up the Chronograph

At the PA/ISSF National Championships the NRC will provide a chronograph for use. The Organizing Committee will provide a second chronograph of a make and model approved by the NRC, which may be used in case of damage, failure or other unforeseen event that renders the NRC chronograph unusable. (The NRC chronograph is a CED M2 with infra-red screen set)

Power source will be 240V mains power.

The screens will be set 2ft apart (this is the manufacturer default)

The pistol will be fired with the muzzle 8 to 10 feet from the first screen (i.e. the start sensor) or as per the manufacturer's recommendation.

The chronograph should be set up in a sheltered area with even lighting but should not be in direct sunlight. If necessary a translucent screen may be erected across the chronograph to shield it from direct sunlight – care must also be taken to ensure reflected light cannot cause a problem.

Chronographing Procedure for the PA matches

1. Collect 10 (ten) rounds from all competitors.
 2. Pull and weigh one projectile from a cartridge.
 3. Load 4 cartridges into pistol or revolver and align the barrel horizontally to be able to fire across the chronograph (i.e. through the screens).
 4. Fire a round to settle ammunition into the state in which the remainder of the rounds will be fired. The remaining rounds will now be in the position in which at least 80% of the rounds will be fired during the match.
 5. Without changing the horizontal alignment of the barrel, fire the next round through the chronograph screens and check if power factor (PF) has been achieved. If PF is achieved unload the firearm and return the ammunition and components to the competitor.
 6. If PF is not achieved repeat the process per item 5 above
 7. If PF is still not achieved provide competitor with option to either
 - a have the next round fired (per item 5) – if PF is not achieved then the competitor will be disqualified
- OR**
- b have the remaining projectile pulled and weighed to ascertain if it is heavier than the previously pulled projectile.
 - i If projectile is heavier, multiply by the velocity of each of the 2 chronographed rounds to ascertain if the required PF has been achieved.
 - ii If projectile is lighter then PF has not been achieved and the competitor will be disqualified.
8. In the case of a disqualification the competitor or the jury member in charge may request that a control test be carried out.



**RECOMMENDED CHRONOGRAPH PROCEDURES FOR PA NATIONAL CHAMPIONSHIPS
[NRC001]**

Chronographing Procedure for ISSF Rapid Fire

1. Collect 10 (ten) rounds from all competitors - only one competitor per relay will have the ammunition tested.
2. Pull and weigh one projectile from a cartridge. (Do not use a kinetic puller for rim-fire rounds).
3. If the weight of the projectile is less than 39 grains (2.53gms) two additional bullets must be pulled and weighed. If the average weight of the three bullets is less than 39 grains (2.53gms) the competitor must be disqualified.
4. Load 4 cartridges into the pistol or revolver and align the barrel horizontally to be able to fire across the chronograph (i.e. through the screens).
5. Fire a round to settle ammunition into the state in which the remainder of the rounds will be fired. The remaining rounds will now be in the position in which at least 80% of the rounds will be fired during the match.
6. Without changing the horizontal alignment of the barrel, fire three rounds through the chronograph screens.
7. If the average velocity for the three shots is less than 250.00 m/sec the procedure per item 6 must be repeated. If the average velocity for the six shots is less than 250.0 m/sec the competitor must be disqualified.
8. In the case of a disqualification the competitor or the jury member in charge may request that a control test be carried out. (PA application of ISSF Annex B - note 10b)

Chronograph Calibration/Consistency Procedure

It is not possible to provide a professionally calibrated chronograph as there is no testing agency that would certify such a calibration outside of laboratory conditions. The following method of checking the validity of readings will be used at national championships

1. The Organizing Committee must provide one semi-automatic .22LR pistol (i.e. a standard pistol) and one box of 50 rounds of good quality .22 ammunition. These items must be kept available throughout the competition in case retesting is required.
2. Prior to the start of competition each day (i.e. on days when ammunition testing will be required) the Jury will supervise the following procedure
 - a. Under Jury supervision five shots will be fired with the 'test' pistol and ammunition across the chronograph. The highest and lowest readings will be discounted and an average of the remaining 3 readings will be used as control data.
 - b. The complete test results will be documented and retained by the Classification Office (or Jury).
 - c. This cumulative log will be retained after the competition for comparison purposes.
 - d. The CRO will put the firearm and the ammunition away securely, where it can be easily retrieved but cannot be used for other purposes throughout the competition.
3. In the event of a failure to meet the applicable ammunition requirements the competitor may request that this test be repeated and the data compared to the control data.
4. If the chronograph reading is found to be significantly less (3% or greater) than that of the control data the competitor must not be disqualified and the chronograph must be repaired or replaced.
5. If the chronograph reading is found to be correct then the competitor will be disqualified.

Availability for training

The chronograph MUST be available for competitors to test their ammunition during the training days. (Service Pistol rule 7.4 – Note 15, ISSF Annex B Item 7).

Note 1

It is suggested that initial testing is also done using a 6" revolver and ammo of known PF in order to ascertain the accuracy of the chronograph. This test need only be done at the start of the competition.