



USA Cycling Aero Equipment Regulations for Collegiate Cycling

Information compiled by Raymond Edward Junkins, President, Stevens Cycling

On November 15, 2008 the ECCC voted to restrict riders in time trials to solely mass start legal equipment as defined by the UCI. Further, on November 2, 2009 USA Cycling created rule 7J to extend these rules to all collegiate events (individual and mass start). For 2010, these rules will apply to all "non-A" categories, and will extend to all categories in 2011. UCI mass start restrictions are summarized as follows:

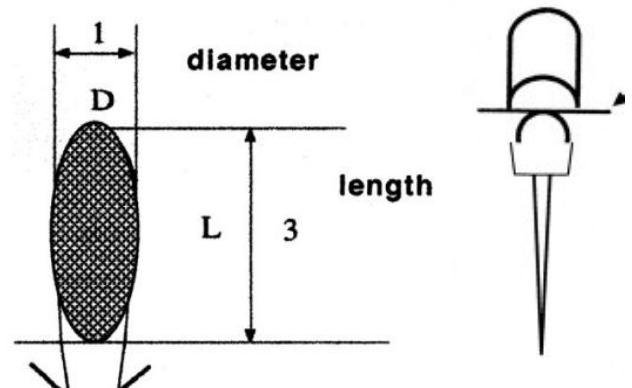
Bicycle Design/Dimensions

The general dimensions of the bicycle frame and wheels are not in question and are relatively straightforward to follow and are not discussed here. This does not mean they are unimportant; rather something you can review without interpretations. If you have a custom built bicycle or want to use a one of a kind design, you should review the following information in detail. (UCI Regulations Chapter 1-1.3.001)

The overriding principle required for frame design is a "double triangle", the front triangle formed by the seat, top and down tube, the second formed by the seat tube and rear wheel stays. For specific events, some variation is allowed in the frame design of a bicycle, specifically for track and time trial events. The familiar straight line, double triangle form is for mass start events for road and cyclo-cross. For time trial and track events, there is an allowance of a more free flowing design, although the same double triangle is evident if you just ignore the curves and connect the dots.

Frame Design Explained

First is the 3:1 length to width ratio of all tubes, seen in *figure 1*, (given that no dimension exceeds 8 cm). The nice part about this rule the Length to Width ratio is not relative to the tube as the bike travels down the road but is relative to the cross section of the tube. With this we can achieve an effective length to width ratio of over 4.6:1 while staying within UCI geometry restrictions. Next, is the fairing rule (UCI rule 1.3.024), which states that there should be no fairing that will inhibit an object such as a credit card from passing between the frame and the wheel (this is targeting wheel cut outs). In *figure 2* the straight line is the "credit card" like object, and the top would be the seat tube and the bottom arc being the leading edge of the rear wheel (lower diagram to the right). Thus, as long as the frame does not "enclose" or wrap around the sides of the wheel. However, the frame can protect the leading edge/surface of the tire. In this case, a straight (no minimum thickness) object must be able to pass without interference at all points between the frame and tire in the direction perpendicular to the rotation of the wheel.



Bike Weight

For all road, cyclo-cross and track events there is a minimum weight requirement of 6.8 kg (14.99 lb). Ultra light road bikes and many track bikes may weigh less than the minimum weight. These are not allowed without adding additional weight to the bicycle to achieve the minimum weight. Water bottles, water bottle cages, tool bags, speedometers, pumps and such items that can simply be removed from the bike are not counted in the minimum required weight.

Handlebars

The regulations limit the normal forward reach of standard handlebars to 5 cm beyond the front wheel axle. This does not include the brake levers. As with most bicycles, the manufacturing industry makes compliance happen almost regardless of the components or frame. Handlebars of any kind must be lower than a level line drawn from the top of the saddle. The lowest part of the bars must also be higher than the top of the wheels. No extensions (including aero bars).

Helmets

According to UCI a helmet is mass start legal if it meets certain crash test ratings. In the United States, those ratings are CPSC, CE and ASTM (formerly ANSI). CPSC, is the law in the United States, all helmets sold in the country must meet these safety requirements. If you buy your helmet in the United States you can race with it. If your helmet meets these testing standards (all of them) you can use it even if it is "aero." The rule states:

At all times when participating in or preparing for an event held under a USA Cycling permit, including club rides, all licensees who are mounted on a bicycle must wear a securely fastened helmet that meets either the US DOT helmet standards or one of the following standards:

- (1) American National Standards Institute (ANSI) Standard Z90.4;
- (2) Snell Memorial Foundation Standard "B" or "N" series;
- (3) American Society for Testing and Materials (ASTM) standard F-1447.
- (4) Canadian Standards Association (CSA) standard CAN/CSA-D113.2-M;
- (5) U.S. Consumer Product Safety Commission (CPSC) standard for bicycle helmets;
- (6) European Committee for Standardization (CE EN1078) standard for bicycle helmets

Bike Fit and Adjustment

The rider's points of supports, saddles, handlebars and pedals, have dimensional and adjustment limits that affect the rider's position on the bicycle. The regulations for rider's fit on the bicycle vary between general endurance and pure speed events. First, the standard fit details are given. Following this, exceptions for body fit, or morphological exceptions will be reviewed. For endurance or all mass start events; **road, track and cyclo-cross**, the nose of the saddle must be a minimum of 5 cm behind a vertical line drawn up through the center of the crank axle. For speed events (track); **sprint, 500m, 750m, kilometer and team sprint**, the nose of the saddle may move forward inside this 5 cm dimension, but never beyond the center of the crank. These measurements are made using a jig.

Saddle Position Morphology and Exceptions

One of the primary fit regulation issues is where the nose of the saddle can be in relation to a vertical line through the bottom bracket. As noted above, the regulation indicates the saddle must be 5 cm behind this line for most events. A rider whose saddle position is forward of this point, but no further forward than the center of the bottom bracket, must pass the following morphology test to be allowed to use this saddle position. Seated on the bike, with feet in shoes and clipped into the pedals, the foot/pedal is placed in the forward position (pedal horizontal-3 o'clock). In this position, the leading edge of the knee cannot be forward of the vertical line through center of the pedal axle. If the knee is found to be forward of this line, the saddle must be adjusted backwards and the verification is undertaken again. If the saddle cannot be adjusted for proper compliance, a smaller saddle might be an option. The saddle must be between 24 cm and 30 cm in length. Shorter riders and those with small frames are more likely to need this fit test performed. Note that the rider may not slide off the back of the saddle to move the knee back for this test. In fact, a rider who has normal leg length and is over 5' 6" really has no business requesting this test as such a rider can easily attain a legal position simply by moving the saddle back.

Wheels

Wheels must be of the same diameter, between 550 mm and 700 mm, including the tire. For mass start races if the wheel does not pass the test of being "traditional" it must be specifically approved by the UCI. The regulations define a "traditional wheel" as any wheel with a rim with any cross section dimension no larger than 2.5 cm and with a minimum of 16 metallic spokes, whose maximum cross section does not exceed 2.4 mm. Any wheel more exotic than this for mass start events must first be tested and approved by the UCI. The UCI maintains a web site with this information under the "Rules" tab. The publication, "Non-Standard Wheels in Conformity with Article 1.3.018" contains the latest approved wheels.

Clarifications

For clarifications or further explanation feel free to contact Raymond Junkins at Stevens: (845) 820 2577 or rjunkins@stevens.edu.

The Non-Standard Wheels in Conformity with Article 1.3.018ⁱ ⁱⁱ (There are no exceptions)

Note: Many teams have sponsorship deals with Neuvation (Neugent). The only mass start legal Neuvation wheels that are deeper than 25 mm are the M28 Aero series.

Note: If a wheel does not meet the dimensions specified above and is not on this list it cannot be used. Some wheels may use the same rim as a mass start legal wheel. However if the wheel is not on the list it cannot be used.

ADA

- Ada wheel – V profile (50mm)

Ambrosio

- Ambrosio LUSTER (24/28 rayons / spokes)
- Ambrosio F28COMP (20/24 rayons / spokes)
- Ambrosio XCARBO (28 rayons / spokes)
- Ambrosio XUL (28 rayons / spokes)
- Ambrosio XXL (20/24 rayons/spokes–jante/rim ZIPP 360 tubular)
- Ambrosio XXL (20/24 rayons/spokes–jante/rim ZIPP 505clinchner)
- Ambrosio LASERPRO (20/24 rayons / spokes)
- Ambrosio THEOREMA (16/20 rayons / spokes)

American Classic

- American Classic CR-420 (18 rayons / spokes)
- American Classic Carbon 38
- American Classic Carbon 58

Aerohead

- Clincher Pro front wheel (16 rayons / spokes)

Bianchi

- XL Levitation (16, 24 rayons / spokes)
- XL Elevation (16, 24 rayons / spokes)

Campagnolo

- NEUTRON Tubular - Clincher
- NEUTRON Ultra (Clincher) (22 rayons / spokes)
- HYPERON
- KHAMISIN (Clincher) (24 rayons / spokes)
- SHAMAL Ultra Tubular – Clincher (16 rayons / spokes)
- PROTON
- EURUS WH02-EUCF
- EURUS CARBON code WH4-EUCFC
- EURUS 2006 CLINCHER TUBULAR (16 rayons / spokes)
- BORA
- SCIROCCO G3 AND SCIROCCO 2006 CLINCHER (20 rayons / spokes)
- ZONDA G4 AND ZONDA 2006 CLINCHER (16 rayons / spokes)
- ZONDA (production stoppée en 1999) (18 rayons / spokes)
- ATLANTA 96 (production stoppée en 1999) (28, 32, 36 rayons / spokes)
- VENTO 63 AND VENTO 2006 (24 rayons / spokes)
- ZONDA (16 rayons / spokes)

Carbonsports

- Light Weight by Carbonsports – Modèle Ventoux (20 rayons / spokes)
- Lightweight Obermayer 12 Gen. II
- Lightweight Obermayer 16 Gen. II
- Lightweight Obermayer 20 Gen. II
- Lightweight Standard 12 Gen. II
- Lightweight Standard 16 Gen. II
- Lightweight Standard 20 Gen. II
- Lightweight Standard 16 Gen. III (16, 20 rayons / spokes)

Cole

- Shuriken tubular (16, 20 rayons / spokes)

Colnago

- Colnago Star

Corima

- Aéro boyau (18, 24 rayons / spokes)
- Aéro pneu (18, 24 rayons / spokes)
- Stevens Scorpio tubulars (18, 24 rayons / spokes)
- Stevens Scorpio clinchers (18, 24 rayons / spokes)

Citec

- Citec 3000 aluminum (16 rayons / spokes)
- Citec Ultralite aluminum (20 rayons / spokes)
- Citec Jet aluminum (16 rayons / spokes)

- Citec 3000 S Aero (14 rayons / spokes)
- Citec 6000 CX Carbon (12 rayons / spokes)

Décathlon

- Penta Aero 20

Dierl

- Light Weight Carbon Fiber * (20 rayons / spokes)

DT Swiss

- RRC 1250 clincher (18 rayons/spokes)
- RR 1850 clincher (20 rayons/spokes)
- RRC 425F Tubular 32 (REYNOLDS MV32 T UL) (20 rayons/spokes)
- RRC 570F Clincher 32 (REYNOLDS MV32C UL) (20 rayons/spokes)
- RRC 445F Tubular 46 (REYNOLDS DV46T UL) (16/20 rayons/spokes)
- RRC 600F Clincher 46 (REYNOLDS DV46C UL) (16/20 rayons/spokes)

Edge Composites

- Edge Composites – 68 (Tubular Edge – Carbon rim) (20 rayons / spokes)

Fast Forward Wheels B.V.

- FFWD F6 (20 rayons/spokes)

Fir

- Galaxium – jante alu – ailettes carbonées sur rayons
- RA Antara (28 rayons / spokes)
- RA Antara (18 rayons / spokes)
- Speed Lite (18, 24, 28 rayons / spokes)

FSA Europe

- FSA Europe K-Force Carbon (Tubular) (20 rayons plats carbone/flat spokes)

Fulcrum

- Racing 1 (16 rayons / spokes) tubular / clincher
- Racing 3 (16 rayons / spokes) clincher
- Racing 5 (24 rayons / spokes) clincher
- Racing FC Tubular
- Racing Light (22 rayons / spokes) tubular / clincher
- Racing 0 (16 rayons / spokes) tubular / clincher
- Racing 5 Evolution (20 rayons / spokes) clincher
- Racing Speed (18 rayons / spokes) tubular
- Racing 7 (20 rayons / spokes) clincher

Gipiemme

- Gipiemme Grecal 28”
- Gipiemme Tecno Star 28”
- Gipiemme Tecno 024 Race 28”
- Gipiemme Fulcrum 28
- Gipiemme Tecno 1.55 (20 rayons / spokes)
- Gipiemme Tecno 324 (24 rayons / spokes)
- Gipiemme Tecno 716 (16 rayons / spokes)
- Gipiemme Carbon H4.0 (20 rayons / spokes)
- Gipiemme Carbon H5.5 (20 rayons / spokes)
- Phoenix (20 rayons / spokes)

HED

- ALPS 700C (18 rayons / spokes)
- Hed Stinger 6 Rim 6.0 cm – 18/24 spokes
- Hed Stinger 9 Rim 9.0 cm – 18/24 spokes
- Hed Jet 6 Rim 6.3 cm – 18/24/28 spokes
- Hed Jet 9 Rim 9.0 cm – 18/24/28 spokes
- Hed Scorpio or Stinger 3 (18 rayons / spokes)

Kinlin

- XKEYMET KWS-C1 (24 rayons / spokes)
- XKEYMET TB-25 (Tubular)
- 24 FLAT SPOKES WHEEL
- KINLIN KLM41 ETRTO 700C–635

MANUFACTURE PROCESS T10

Marchisio

- Tetragon (16 rayons / spokes)
- Zephir (16 rayons / spokes)
- Alisea (20 rayons ronds / round spokes)
- Solide (28 rayons / spokes)
- Carbozefir (20 rayons / spokes)

Mavic

- Cosmic (Elite, SL, SL Premium*, Pro, SSC*, Ultimat)
- Cosmic Carbone SLR (Clincher) (20 rayons plats en carbone / flat spokes carbon)
- Ksyrium SSC *
- Ksyrium SSC SL *
- Ksyrium SSC SL2 *
- Ksyrium SSC SL TdF *
- Ksyrium (Equipe, SL, ELITE, ES*)
- Ksyrium SL Premium (18, 20 rayons / spokes)
- Ksyrium SL "10ème anniversaire" clincher (18 rayons / spokes)
- R-SYS SL pneu et boyau (16, 20 rayons / spokes)
- R-SYS Premium pneu (16, 20 rayons / spokes)
- R-SYS Ultimate tubular (16 rayons / spokes)
- R-SYS Lab ISM 3D (16, 20 rayons / spokes)

MICHE

- Supertype (Zipp 404 Tubular)
- Supertype (Zipp 404 Clincher)
- Radial (Zipp 303 Tubular)
- Radial (20, 28 rayons / spokes)
- Supertype 358 (Zipp 365 and 280 rimes Carbon Tubular)
- SWR Carbon (18 rayons / spokes)

Neugent

- Neuvation M28 Aero aluminium (16 rayons plats / flat spokes)

Nippon Mitsubishi Oil Corporation

- Nisseki carbon wheel AM27 (18 rayons / spokes)

Reynolds

- DV46T (Stratus DV) (16/20 rayons/spokes)
- DV46T Assault/Cross/Trak (16/20 rayons/spokes)
- DV46UL (Stratus DV – UL (carbon) (16/20 rayons/spokes)
- DV46T UL (16/20 rayons/spokes)
- DV46C (Stratus DV (carbon) (16/20 rayons/spokes)
- DV46C UL/Assault (16/20 rayons/spokes)
- MV32T (Cirro-MV) (20 rayons/spokes)
- MV32T UL (20 rayons/spokes)
- MV32C (Cirro-MV clincher) (20 rayons/spokes)
- MV32C UL/Attack (20 rayons/spokes)

Ritchey

- WCS Protocol Road (16 rayons / spokes)
- Pro DS Road (20 rayons / spokes)
- Comp DS Road (20 rayons / spokes)
- VELOMAX Circuit

Rolf Prima

- Rolf Prima Vigor (black or silver) (14 rayons / spokes)
- Rolf Prima Echelon (16 rayons / spokes)
- Rolf Prima Carbon TDF 38 (14 rayons / spokes)
- Rolf Prima Carbon TDF 58 (12 rayons / spokes)

Shimano

- WH-R535 clincher alloy rim (black or silver) (16 rayons / spokes)
- WH-540 clincher alloy rim (black) (16 rayons / spokes)

- WH-6500 clincher alloy rim (silver) (16 rayons / spokes)
- WH-7700 clincher or tubular alloy rim (dark green) (16 rayons / spokes)
- WH-7700 tubular carbon (CFRP) rim (black) (16 rayons / spokes)
- WH-7701 clincher or tubular alloy rim (black) (16 rayons / spokes)
- WH-7701 tubular carbon (CFRP) rim (black) (16 rayons / spokes)
- WH-7800 +WH 7801 clincher or tubular alloy rim (silver) DURA ACE (16, 20, 24 rayons / spokes)
- WH-7800 +WH 7801 tubular carbon (CFRP) rim (black) DURA ACE (16, 20, 24 rayons / spokes)
- WH-7800 SL +WH 7801 clincher alloy rim (black) DURA ACE (16, 20 rayons / spokes)
- WH-7850-C50 (clincher or tubular) (16, 20 rayons / spokes)
- WH RS 30 (16 rayons/spokes)
- WH- 7850-C75-TU (12 rayons/spokes)
- WH- 7850-C35-TU (16 rayons/spokes)
- PRO RC50 High Profile Carbon clincher (24 rayons / spokes)
- PRO RC50 High Profile Carbon tubular (24 rayons / spokes)

Spinergy

- Spinergy SRX (2B02) (20, 28 rayons / spokes)
- Spinergy SR3 (2S02) (20, 28 rayons / spokes)
- Spinergy X AERO (PRI-FC-111) (16, 20 rayons / spokes)
- Spinergy X AERO LITE (2L02) (18, 20 rayons / spokes)
- Spinergy X AERO CARBON (16, 20 rayons / spokes)

Sunny Crown Enterprise

- Sunny Crown Enterprise CKT Carbone (16, 18 rayons / spokes)
- CKT AURORA Carbon (16 rayons / spokes)

Thorius

- Thorius – model SHADO Carbon – pneu (16, 20 rayons / spokes)
- Thorius – model SHADO Carbon – boyau (16, 20 rayons / spokes)
- Thorius - model N'ERA (24 rayons / spokes)

Topolino

- Topolino Revelation (24 rayons / spokes)

Token

- Token C30A (20 rayons / spokes)
- Token T50 (20 rayons / spokes)

Trek

- Aeolus 5.0 ACC (16 rayons / spokes)
- Bontrager X-Lite Tubular *
- Bontrager X-Lite Clincher
- Bontrager Race Lite Tubular *
- Bontrager Race Lite Clincher
- Bontrager Race X Lite Carbon *
- Bontrager Race X Lite Aero *
- Bontrager Aero Tubular
- Bontrager Aero Clincher
- Bontrager Triple XXX Lite aero (90mm)
- Bontrager Triple XXX Lite aero (60mm)
- Bontrager Aeolus (16 rayons / spokes)
- Bontrager Aeolus 5.0 ACC (16 rayons / spokes)
- "Vector Comp" (Rolf) *
- "Vector Pro" (Rolf) *
- Triple XXX lite aero rim (16 rayons / spokes) h90
- Triple XXX lite aero rim (16 rayons / spokes) h60

Tufo

- Cyclone Energy Tufo (carbon height + 5 cm) (20 rayons aluminium / aluminium spokes)

Vuelta

- XRP III Silver (24 rayons plats / flat spokes)
- Vuelta Xlite (20 rayons plats / flat spokes)
- Carbon Pro (12 rayons / spokes)

VZAN

- Futura clincher rim (20 rayons plats/flat spokes)
- Concept Road (aluminium rim + 40 mm – clincher edge)

XERO

- XR-1F XERO lite front wheel (16 rayons / spokes)

ZIPPER Speed Weaponry

- ZIPP 303 (Z3) Tubular 700 c (rim ZIPP 280)
- ZIPP 303 Tubular 650 c (rim ZIPP 245)
- ZIPP 404 (Z4) Tubular 700 c (rim ZIPP 360)
- ZIPP 404 Tubular 650 c (rim ZIPP 330)
- ZIPP 404 Clincher 700 c (rim ZIPP 505)
- ZIPP 404 Clincher 650 c (rim ZIPP 460)
- ZIPP 303 Clincher 700 c (rim ZIPP 415)
- ZIPP 303 Clincher 650 c (rim ZIPP 370)
- ZIPP 808 Clincher 700c (rim ZIPP 420)
- ZIPP 808 Tubular 700c (rim ZIPP 420)
- VELOMAX TEMPEST II
- SRAM S40 Clincher (rim ZIPP 415)
- SRAM S60 Clincher (rim ZIPP 505)
- SRAM S80 Clincher (rim ZIPP 520)

ⁱ The list provided was published September 1, 2009

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<http://www.uci.ch/Modules/BUILTIN/getObject.asp?MenuId=MTkzNg&ObjTypeCode=FILE&type=FILE&id=NDkyNTc&LangId=1>