SPECIALIZED BICYCLE OWNER'S MANUAL APPENDIX A SUPPLEMENT

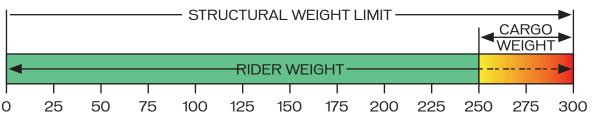
2022 RIDER/BIKE WEIGHT LIMITS AND TERRAIN CONDITIONS



INTRODUCTION

This Appendix A manual supplement is designed as an annual addition to the Appendix A section found in the Specialized Bicycle Owner's Manual. This appendix is designed to help the rider determine if a bike is suitable for the intended use and the combined Rider Weight and Cargo Weight.

Each bike model has an intended use and is designed and tested to support a Structural Weight Limit, which includes a Cargo Weight Limit. As the weight of the rider approaches the Structural Weight Limit of the bike, the allowable Cargo Weight might be reduced. For example, a bike may have a 55 lb Cargo Weight Limit, but if the weight of the rider is too close to the bike's Structural Weight Limit, the rider may only be allowed to carry a smaller amount of cargo or no cargo at all. See the following page for a model-specific example and graphs.



UNDERSTANDING WEIGHT LIMITS

FRAME STRUCTURAL WEIGHT LIMITS

Structural Weight Limits for each bike are determined by Specialized through extensive lab testing, and are listed in the Bike Model, Structural Weight Limit and Cargo Weight Limit Tables.

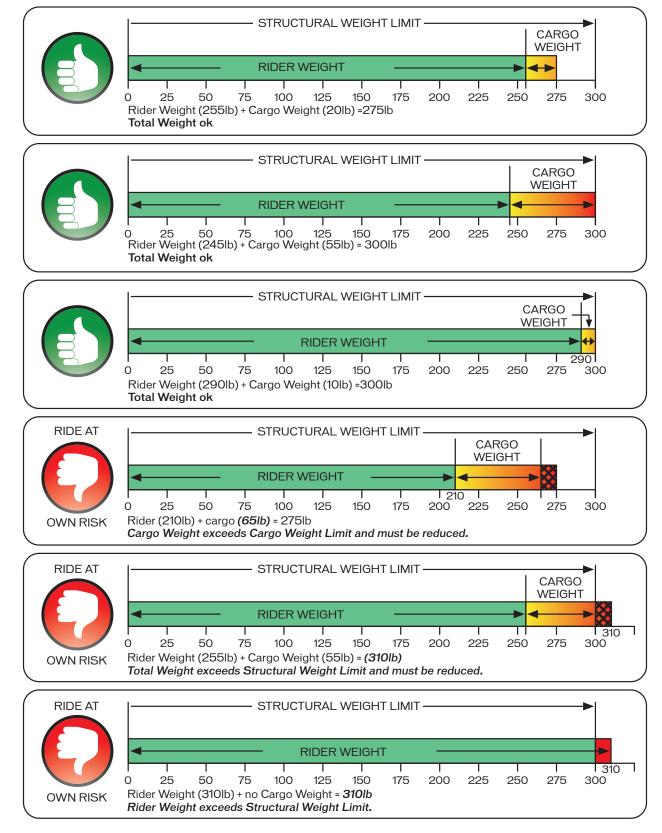
| A CONTRACTOR | STRUCTURAL WEIGHT LIMIT | The maximum Total Weight (rider and cargo) a bike is designed and tested to support structurally. | |
|--------------|-------------------------|--|--|
| lb Îkg | RIDER WEIGHT | The weight of the rider in riding gear (e.g., jacket, helmet cam, hydration pack, helmet, etc.). | |
| | CARGO WEIGHT | The weight of any additional accessories (e.g., panniers, front/rear racks, saddle bags, handlebar bags, baskets, etc.) not accounted for in Rider Weight. | |
| lb/kg | CARGO WEIGHT LIMIT | The maximum Cargo Weight a bike has been designed and tested to support structurally. | |
| | TOTAL WEIGHT | The sum of Rider Weight and Cargo Weight. | |

WARNING! Failure to follow these instructions and exceeding the specified Structural Weight and Cargo Limits may impair the structural integrity of the bicycle and may cause serious personal injury or death. For riders at the Rider Weight Limit, you may not be able to carry cargo if the Structural Weight Limit is exceeded.

DETERMINING MAXIMUM STRUCTURAL WEIGHT LIMITS

- 1. Determine the bike model in the Structural Weight Limit Table (see page 7).
- 2. Look up the Structural Weight and Cargo Weight Limits of the bike model.
- $\textbf{3.} \ \text{Determine the Rider Weight, which includes all riding gear.}$
- 4. Determine the Cargo Weight, which includes the weight of any additional accessories.
- 5. Subtract the Rider Weight from the Structural Weight Limit. The result is the amount the rider is allowed for Cargo Weight, up to the Cargo Weight Limit prescribed for the bike model.

EXAMPLE: HARDROCK (Structural Weight Limit = 300lb / 136kg. Cargo Weight Limit = 55lb / 25kg)



INTENDED USE OF YOUR BICYCLE

WARNING! Understand your bike and its intended use. Choosing the wrong bicycle for your purpose can be hazardous. Using your bike the wrong way is dangerous.

No single type of bicycle is suited for all purposes. Your Authorized Specialized Retailer can help you pick the "right tool for the job" and help you understand its limitations. There are many types of bicycles and many variations within each type. There are many types of mountain, road, racing, hybrid, touring, cyclocross and tandem bicycles.

There are also bicycles that mix features. For example, there are road/racing bikes with triple cranks. These bikes have the low gearing of a touring bike, the quick handling of a racing bike, but are not well suited for carrying heavy loads on a tour, for which, you want a touring bike.

Within each of type of bicycle, one can optimize the bicycle for certain purposes. Visit your Authorized Specialized Retailer and find someone with expertise in the area that interests you. Do your own homework. Seemingly small changes such as the choice of tires can improve or diminish the performance of a bicycle for a certain purpose.

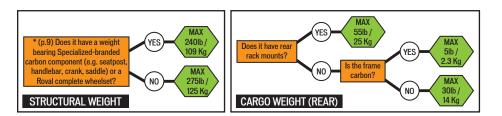
On the following pages, we generally outline the intended uses of all bike types and we specify the Structural Weight Limit by bike family/model.

Industry usage conditions are generalized and evolving. Consult your Authorized Specialized Retailer about how you intend to use your bike.

HIGH-PERFORMANCE ROAD

| | CONDITION 1 | Bikes designed for riding on a paved surface where the tires do not lose ground contact. |
|-----------------------------------|--------------|--|
| | INTENDED | To be ridden on paved roads only. |
| | NOT INTENDED | For off-road, cyclocross, or touring with racks or panniers. |
| For riding on pavement only | TRADE OFF | Material use is optimized to deliver both light weight and specific performance. You must understand that (1) these types of bikes are intended to give an aggressive racer or competitive cyclist a performance advantage over a relatively short product life, (2) a less aggressive rider will enjoy longer frame life, (3) you are choosing light weight (shorter frame life) over more frame weight and a longer frame life, (4) you are choosing light weight over more dent resistant or rugged frames that weigh more. All frames that are very light need frequent inspection. These frames are likely to be damaged or broken in a crash. They are not designed to take abuse or be a rugged workhorse. See also Appendix B. |
| BIKE MODELS | | |

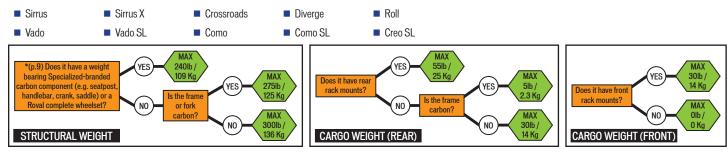




GENERAL PURPOSE RIDING

| CONDITION 2 | | Bikes designed for riding Condition 1, plus smooth gravel roads and improved trails with moderate grades where the tires do not lose ground contact. |
|--|--|--|
| INTENDED For paved roads, gravel or dirt roads that are in good condition, and bike paths. | | For paved roads, gravel or dirt roads that are in good condition, and bike paths. |
| Per riding on and randways only No jumping | | For off-road or mountain bike use, or for any kind of jumping. Some of these bikes have suspension features, but these features are designed to add comfort, not off-road capability. Some come with relatively wide tires that are well suited to gravel or dirt paths. Some come with relatively narrow tires that are best suited to faster riding on pavement. If you ride on gravel or dirt paths, carry heavier loads or want more tire durability talk to your Authorized Specialized Retailer about wider tires. |

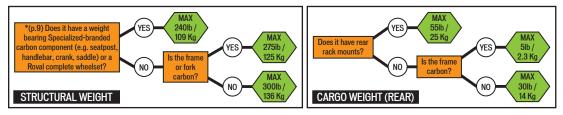
BIKE MODELS



| | CYCLO-CROSS | | | | |
|---|-------------|--------------|---|--|--|
| CONDITION 2 | | CONDITION 2 | Bikes designed for riding Condition 1, plus smooth gravel roads and improved trails with moderate grades where the tires do not lose ground contact. | | |
| | | INTENDED | For cyclo-cross riding, training and racing. Cyclo-cross involves riding on a variety of terrain and surfaces including dirt or mud surfaces. Cyclo-cross bikes also work well for all weather rough road riding and commuting. | | |
| For riding on improved path and roadways. No jumping | | NOT INTENDED | For off road or mountain bike use, or jumping. Cyclo-cross riders and racers dismount before reaching an obstacle, carry their bike over the obstacle and then remount. Cyclo-cross bikes are not intended for mountain bike use. The relatively large road bike size wheels are faster than the smaller mountain bike wheels, but are not as strong. | | |

BIKE MODELS

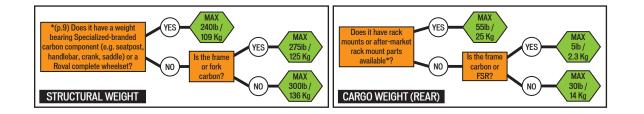
CruX



CROSS-COUNTRY, MARATHON, HARDTAILS

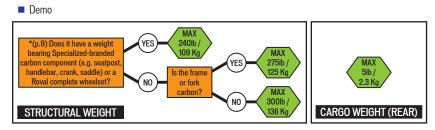
| B For tiding on unimproved trails with small obstacles | CONDITION 3 | Bikes designed for riding Conditions 1 and 2, plus rough trails, small obstacles, and smooth technical areas, including areas where momentary loss of tire contact with the ground may occur. NOT for jumping. All mountain bikes without rear suspension are Condition 3, as well as some lightweight rear suspension models. |
|---|--------------|--|
| | INTENDED | For cross-country riding and racing which ranges from mild to aggressive over intermediate terrain (e.g., hilly with small obstacles like roots, rocks, loose surfaces, hard pack and depressions). Cross-country and marathon equipment (tires, shocks, frames, drive trains) are light-weight, favoring nimble speed over brute force. Suspension travel is relatively short since the bike is intended to move quickly on the ground. |
| | NOT INTENDED | For Hardcore Freeriding, Extreme Downhill, Dirt Jumping, Slopestyle, or very aggressive or extreme riding. Not for spending time in the air, landing hard and hammering through obstacles. |
| Sinairobstacles | TRADE OFF | Cross-Country bikes are lighter, faster to ride uphill, and more nimble than All-Mountain bikes. Cross-Country and Marathon bikes trade off some ruggedness for pedaling efficiency and uphill speed. |
| BIKE MODELS | | |

 Epic
 Epic HT
 Epic Evo
 Fuse
 Tero
 Chisel HT
 Rockhopper



| | | ALL MOUNTAIN | | | | |
|---|--------------------------------------|---|--|--|--|--|
| | CONDITION 4 | Bikes designed for riding Conditions 1, 2, and 3, plus rough technical areas, moderately sized obstacles, and small jumps. | | | | |
| | INTENDED | or trail and uphill riding. All-Mountain bicycles are: (1) more heavy duty than cross country bikes, but less heavy duty than Freeride bikes, 2) lighter and more nimble than Freeride bikes, (3) heavier and have more suspension travel than a cross country bike, allowing them to be dden in more difficult terrain, over larger obstacles and moderate jumps, (4) intermediate in suspension travel and use components that t the intermediate intended use, (5) cover a fairly wide range of intended use, with models that are more or less heavy duty. Talk to your uthorized Specialized Retailer about your needs and these models. | | | | |
| For riding on rough trails with medium obstacles | NOT INTENDED | use in extreme forms of jumping/riding such as hardcore mountain, Freeriding, Downhill, North Shore, Dirt Jumping, Hucking etc. Not arge drop offs, jumps or launches (wooden structures, dirt embankments) requiring long suspension travel or heavy duty components; not for spending time in the air landing hard and hammering through obstacles. | | | | |
| | TRADE OFF | All-Mountain bikes are more rugged than cross country bikes, for riding more difficult terrain. All-Mountain bikes are heavier and harder to ride uphill than cross country bikes. All-Mountain bikes are lighter, more nimble and easier to ride uphill than Freeride bikes. All-Mountain bikes are not as rugged as Freeride bikes and must not be used for more extreme riding and terrain. | | | | |
| BIKE MODELS | | | | | | |
| Enduro FSRStatus | Stumpjumper FSR | Stumpjumper Evo SL Levo FSR Levo SL Kenevo FSR Kenevo SL | | | | |
| carbon component (e.g. seatpost, handlebar, crank, saddle) or a Roval complete wheelset? STRUCTURAL WEIGHT | NO Is the fram or fork carbon? | 2.3 Kg | | | | |
| | 1 | | | | | |
| | CONDITION 5 | Bikes designed for jumping, hucking, high speeds, or aggressive riding on rougher surfaces, or landing on flat surfaces. However, this type of riding is extremely hazardous and puts unpredictable forces on a bicycle which may overload the frame, fork, or parts. If you choose to ride in Condition 5 terrain, you should take appropriate safety precautions such as more frequent bike inspections and replacement of equipment. You should also wear comprehensive safety equipment such as a full-face helmet, pads, and body armor. | | | | |
| 5 Ber extreme riding User caution advised | INTENDED | For riding that includes the most difficult terrain that only very skilled riders should attempt. Gravity, Freeride, and Downhill are terms which describe hardcore mountain, north shore, slopestyle. This is "extreme" riding and the terms describing it are constantly evolving. Gravity, Freeride, and Downhill bikes are: (1) heavier and have more suspension travel than All-Mountain bikes, allowing them to be ridden in more difficult terrain, over larger obstacles and larger jumps, (2) the longest in suspension travel and use components that fi heavy duty intended use. There is no guarantee that extreme riding will not break a Freeride bike. WARNING! The terrain and type of riding that Freeride bikes are designed for is inherently dangerous. Appropriate equipment, such as a Freeride bike, does not change this reality. In this kind of riding, bad judgment, bad luck, or riding | | | | |
| | NOT INTENDED | To be an excuse to try anything. Read Section 2. F of the Bicycle Owner's Manual | | | | |
| | TRADE OFF | Freeride bikes are more rugged than All-Mountain bikes, for riding more difficult terrain. Freeride bikes are heavier and harder to ride uphill than All-Mountain bikes. | | | | |

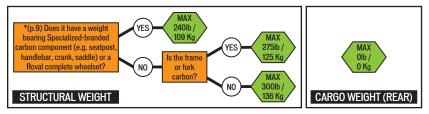
BIKE MODELS

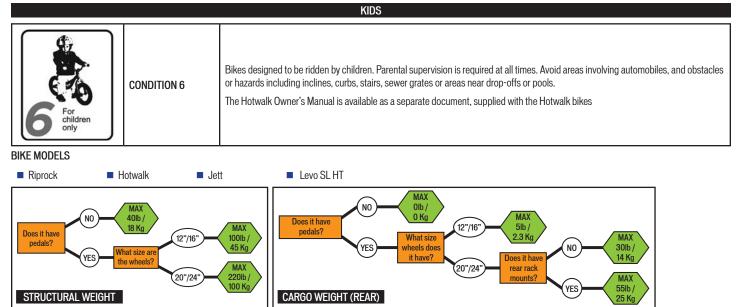


| | DIRT JUMP | | | | |
|-------------------------|--------------|---|--|--|--|
| | CONDITION 5 | Bikes designed for jumping, hucking, high speeds, or aggressive riding on rougher surfaces, or landing on flat surfaces. However, this type of riding is extremely hazardous and puts unpredictable forces on a bicycle which may overload the frame, fork, or parts. If you choose to ride in Condition 5 terrain, you should take appropriate safety precautions such as more frequent bike inspections and replacement of equipment. You should also wear comprehensive safety equipment such as a full-face helmet, pads, and body armor. | | | |
| | INTENDED | For man-made dirt jumps, ramps, skate parks other predictable obstacles and terrain where riders need and use skill and bike control, rather than suspension. Dirt Jumping bikes are used much like heavy duty BMX bikes. | | | |
| For extreme | | A Dirt Jumping bike does not give you skills to jump. Read Section 2. F of the Bicycle Owner's Manual. | | | |
| User caution advised | NOT INTENDED | For terrain, drop offs or landings where large amounts of suspension travel are needed to help absorb the shock of landing and help maintain control. | | | |
| | TRADE OFF | Dirt Jumping bikes are lighter and more nimble than Freeride bikes, but they have no rear suspension and the suspension travel in the front is much shorter. | | | |

BIKE MODELS

P.Series





WEIGHT LIMITS (see page 9 for details) CATEGORY (See Intended Use, page 3) **BIKE MODEL** CARGO STRUCTURAL REAR (lb/kg) FAMILY MODEL FRONT (lb/kg) (lb/kg) **AETHOS** ALL MODELS 1 5/2.3 0/0 240/109 E5 / E5 ELITE / E5 SPORT 1 30/14 0/0 275/125 ALLEZ 0/0 SPRINT COMP DISC 1 30/14 240/109 CHISEL ALL MODELS 3 30/14 0/0 300 / 136 ALL MODELS 2 30/14 COMO 55/25 300/136 2 30/14 COMO SL ALL MODELS 55/25 300/136 COMP CARBON / EXPERT CARBON / SW CARBON / SW CARBON EVO 2 5/2.3 0/0 240/109 CREO SL E5 COMP 2 30 / 14 0/0 275/125 COMP CARBON EVO, EXPERT CARBON EVO 2 5/2.3 0/0 275 / 125 1.0 / 1.0 STEP THROUGH / 2.0 / 2.0 STEP THROUGH 2 30/14 55/25 300 / 136 CROSSROADS 2 3.0 / 3.0 STEP THROUGH 55/25 30/14 275/125 CRUX ALL MODELS 2 5/2.3 0/0 240/109 5 EXPERT 5/2.3 0/0 300 / 136 DEMO RACE 5 5/2.3 0/0 240 / 109 COMP CARBON / EXPERT CARBON / PRO CARBON / SW 2 30/14 55/25 240 / 109 DIVERGE E5 / E5 COMP / E5 ELITE / E5 EXPERT EVO / SPORT CARBON 2 55/25 30/14 275 / 125 COMP / EXPERT / LTD 4 5/2.3 0/0 275 / 125 **ENDURO** 4 SW / SW LTD 5/2.3 0/0 240 / 109 PRO / SW / SW SPEED OF LIGHT 3 0/0 240/109 5/2.3 FPIC COMP / EXPERT 3 0/0 5/2.3 275/125 BASE / COMP / EXPERT / PRO 3 5/2.3 0/0 275/125 EPIC EVO SW / SW LTD 3 5/2.3 0/0 240/109 BASE / COMP / EXPERT 3 0/0 5/2.3 275 / 125 EPIC HT SW 3 0/0 240/109 5/2.3 ALL MODELS 0/0 FUSE 3 30/14 300/136 CARBON 6 5/2.3 0/0 40/18 HOTWALK HOTWALK / HOTWALK INT 6 30/14 0/0 40/18 JETT 16 SINGLE SPEED / JETT 16 SINGLE SPEED INT / JETT 20 / JETT 20 INT / 6 30/14 0/0 100/45 JETT 20 SINGLE SPEED / JETT 20 SINGLE SPEED INT JETT JETT 24 / JETT 24 INT / JETT SK 6 30/14 0/0 220/100 **KENEVO** ALL MODELS 4 5/2.3 0/0 300/136 COMP CARBON 29 / EXPERT CARBON 29 4 5/2.3 0/0 275/125 KENEVO SL SW CARBON 29 4 0/0 240/109 5/2.3 ALLOY / ALLOY NB / COMP ALLOY / COMP ALLOY NB 4 5/2.3 0/0 300 / 136 COMP CARBON / COMP CARBON NB / EXPERT CARBON / EXPERT CARBON LEV0 4 5/2.3 0/0 275/125 NB/LTD/LTD NB PRO CARBON / PRO CARBON NB / SW CARBON / SW CARBON NB 4 0/0 240 / 109 5/2.3 SW CARBON / SW LTD 4 0/0 240 / 109 5/2.3 LEVO SL COMP CARBON / EXPERT CARBON 4 5/2.3 0/0 275 / 125 LEVO SL HT 24 6 0/0 LEVO SL HT 5/2.3 220/100 P.SERIES ALL MODELS 5 30/14 0/0 300 / 136 20 / 20 INT / 24 / 24 INT / EXPERT 24 / EXPERT 24 INT 6 30/14 0/0 220/100 RIPROCK COASTER 12 / COASTER 12 INT / COASTER 16 / COASTER 16 INT / 6 30/14 0/0 100/45 COASTER 20 / COASTER 20 INT ROCKHOPPER ALL MODELS 3 30/14 0/0 300 / 136 ALL MODELS 2 55/25 30/14 300 / 136 ROLL ROUBAIX ALL MODELS 1 5/2.3 0/0 240 / 109

STRUCTURAL WEIGHT LIMITS

| | | | WEIGH | T LIMITS (see page 9 fo | r details) |
|-----------------|---|--|--------------|-------------------------|------------|
| | BIKE MODEL | CATEGORY (See Intended Use, page 3) | CARGO | | STRUCTURAL |
| FAMILY | MODEL | | REAR (lb/kg) | FRONT (lb/kg) | (lb/kg) |
| SHIV | ALL MODELS | 1 | 5/2.3 | 0/0 | 240 /109 |
| SHIV TT | ALL MODELS | 1 | 5/2.3 | 0/0 | 240 /109 |
| | 1.0 / 2.0 / 2.0 EQ / 2.0 EQ STEP THROUGH / 2.0 SK / 2.0 SK VN / 2.0 STEP THROUGH / 2.0 STEP THROUGH VN / 2.0 VN / 3.0 EQ / 3.0 EQ STEP THROUGH | 2 | 55 / 25 | 30 / 14 | 300 /136 |
| SIRRUS | 3.0 / 3.0 STEP THROUGH / 3.0 STEP THROUGH VN / 3.0 VN / 4.0 / SK | 2 | 55 / 25 | 30 / 14 | 275 /125 |
| | 6.0 | 2 | 55 / 25 | 30 / 14 | 240 / 109 |
| | 2.0 / 2.0 BRA / 2.0 STEP THROUGH / 2.0 STEP THROUGH VN / 2.0 VN / 3.0 / 3.0 BRA / 3.0 EQ / 3.0 EQ STEP THROUGH / 3.0 VN | 2 | 55 / 25 | 30 / 14 | 300 / 136 |
| SIRRUS X | 4.0 / 4.0 EQ / 4.0 SK VN | 2 | 55 / 25 | 30 / 14 | 275 / 125 |
| | 5.0 / 5.0 STEP THROUGH NB | 2 | 55/25 | 30 / 14 | 240 / 109 |
| | ALLOY / COMP ALLOY | 4 | 5/2.3 | 0/0 | 300 / 136 |
| STUMPJUMPER | COMP / EXPERT | 4 | 5/2.3 | 0/0 | 275 / 125 |
| | PRO / SW / SW LTD | 4 | 5/2.3 | 0/0 | 240 / 109 |
| | COMP ALLOY / ELITE ALLOY | 4 | 5/2.3 | 0/0 | 300 / 136 |
| STUMPJUMPER EVO | COMP / EXPERT / LTD / LTD II | 4 | 5/2.3 | 0/0 | 275 / 125 |
| | PRO / SW | 4 | 5/2.3 | 0/0 | 240 / 109 |
| STATUS 140 | BASE | 4 | 5/2.3 | 0/0 | 300/136 |
| STATUS 160 | BASE | 4 | 5/2.3 | 0/0 | 300 / 136 |
| TARMAC | ALL MODELS | 1 | 5/2.3 | 0/0 | 240 / 109 |
| TERO | ALL MODELS | 3 | 55/25 | 0/0 | 300 / 136 |
| VADO | ALL MODELS | 2 | 55/25 | 0/0 | 300 / 136 |
| | 4.0 / 4.0 EQ / 4.0 STEP THROUGH / 4.0 STEP THROUGH EQ | 2 | 55/25 | 0/0 | 300 / 136 |
| VADO SL | 5.0 / 5.0 EQ / 5.0 EQ STEP THROUGH | 2 | 55/25 | 0/0 | 275 / 125 |

STRUCTURAL WEIGHT LIMITS - CRITERIA

| 350lb / 160Kg | 240lb / 109Kg |
|--|------------------------|
| Certain flat bar equipped alloy hybrid / city bikes (without carbon fork) (**marked with asterisks) | All bikes with weight- |
| 300lb / 136Kg | wheelsets with Roval |
| All alloy mountain bikes (without carbon fork) | |
| All flat bar equipped alloy hybrid / city bikes (without carbon fork) (*except those marked with asterisk) | 220lb / 100Kg |
| 275lb / 125Kg | All 24" and 20" Kids |
| All drop bar equipped carbon or alloy road bikes (without carbon components) | 100lb / 45Kg |
| All carbon or alloy cyclocross bikes (without carbon components) | All 16" and 12" Kids b |
| All carbon or alloy triathlon / aero / time trial bikes (without carbon components) | 40lb / 18Kg |
| All flat bar equipped carbon hybrid / city bikes (without carbon components) | All kids walking bikes |
| All flat bar equipped alloy hybrid / city bikes (with carbon fork, without carbon components) | |
| All carbon mountain bikes (without carbon components) | |
| All alloy mountain bikes (with carbon rigid fork, without carbon components) | |

t-bearing Specialized-branded carbon components or Roval wheelsets (complete al-branded rims and hubs) unless otherwise noted by Specialized or Roval

s bikes with pedals

bikes with pedals

es (no pedals)

* WARNING! The Structural Weight Limit for your bicycle is only as high as the item (bicycle or component) with the lowest Structural Weight Limit. The Structural Weight Limit for Roval wheels (complete wheelsets - Roval branded rims and hubs) and/or any weight-bearing Specialized-branded carbon components (including, but not limited to, handlebar, seatpost, stem, crank, saddle, rim, etc.) installed on any brand bike is 240lb (109Kg). Failure to follow this warning may result in serious personal injury or death. This does not apply to non-weight-bearing Specialized-branded carbon components (including, but not limited carbon component, please refer to the manufacturer's instructions for the applicable structural weight limit.

CARGO WEIGHT LIMITS - CRITERIA

| 55lb / 25Kg | |
|--|--|
| All frames with built-in rear rack mounts | A rear rack with cargo (max 55lb / 25Kg) and/or seat bag (max 5lb / 2.3Kg) can be installed and loaded up to a total combined maximum weight of 55lb / 25Kg |
| 30lb / 14Kg | |
| All alloy frames without built-in (original equipment) rear rack mounts* | A rear rack (with the use of separate rack mount clips) with cargo (max 30lb / 14Kg) and/or seat bag (max 5lb / 2.3Kg) can be installed and loaded up to a total combined maximum weight of 30lb / 14Kg. |
| All forks with built-in front rack mounts. | A front rack with cargo can be installed and loaded up to a total maximum of 30lb / 14Kg |
| 5lb / 2.3Kg | |
| All carbon frames without built-in rear rack mounts* | Cargo capacity is limited to a seat bag |
| All full suspension frames (except P.Slope) | Cargo capacity is limited to a seat bag |
| Olb / OKg | |
| All P.Series bikes | No cargo permitted |
| All kids walking bikes (no pedals) | No cargo permitted |
| All forks without built-in front rack mounts | No cargo permitted |

** Fatboy and Fuse models: After-market thru-axle and seat collar kits with built-in rack mount threads are available to retrofit certain frames, which would reclassify the bikes as being able to support 55 lb / 25 Kg of rear cargo weight.



WARNING! The specified Cargo Weight Limit applies only to compatible front and rear racks and seat bags where indicated. In case the specified Cargo Weight Limit differs from the cargo weight limit specified by the rack or seat bag manufacturer, always use the lowest limit. If you add any other load-bearing accessories, including, but not limited to, baskets and child carriers, you do so at your own risk in that these accessories have not been tested for compatibility, reliability or safety on your bicycle. Failure to follow this warning may result in serious personal injury or death.

Recommended Structural Weight Limits are based on International Standards Organization (ISO) 4210 testing standards (for cargo and rider only).