K-SWORD 58
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PRESTIGIOUS
NEW ENTRIES
ITM
advanced cycling

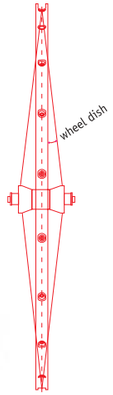
WHEEL AS INTENDED

Cominig into wheel world, ITM decision was “reliability and safety as first”, offering a range able to cover all intended use for a road racing wheel: starting from a basic and sturdy training model up to an high performance agonistic wheel.

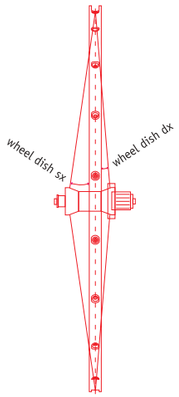
Whatever model it is, ITM rear wheels have a diversified spoke assembly between left and right side, with right spoke number double in respect of left one’s: “to double to half”.

To define wheel quality, key point is “wheel dish”, spoke inclination in respect of rim plane.
A low inclination assure a good lateral stiffnes and a good vertical elasticity, having also spoke tension low enough.
And if this result is quite easy to obtain on front wheel, on rear wheel we have a “little problem” related to sprocket cassette on right side, wivh lead to an high inclination on this side.

Front wheel



Rear wheel

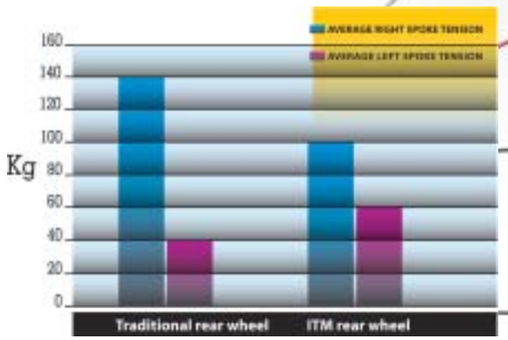


BY ITM

Because of high inclination means high spoke tension, a traditional rear wheel has right spokes more tensioned than left ones. Moreover, also from a dinamic point of wiev right spokes are more stressed, due to torsion effect applied by sprockets.

All those consideration lead to ITM choice: to have right spoked doubled in respect of left ones.

The result is a tension distribution much more balanced between left and right side, as show in graph attached.



Wich “plus” we have?
Hazard reduction in term of right spoke breaking, due to spoke tension reduction: it means a more safe wheel.

Hazard reduction in term of tension loosing on left spoke, more tensioned. it means a more manteinance- free wheel.

When a right spoke breaking occur, wheel misalignement is small, so it is possible to drive home by ciclying: it means a more reliable wheel.

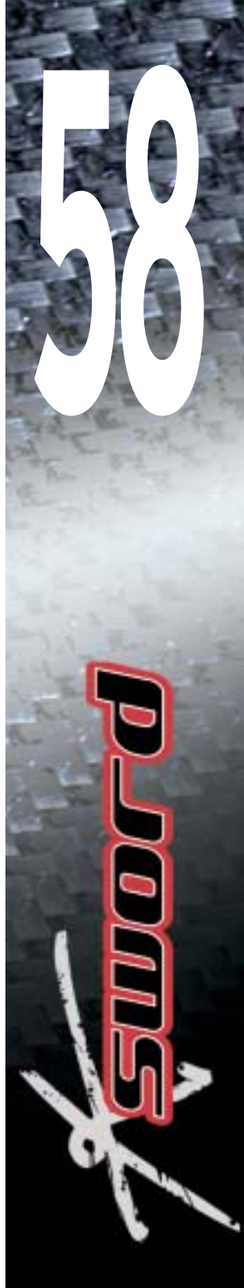
ITM

The K-Sword 58 is the top level of ITM's wheels.

All the wheel materials underline that the K-Sword 58 is designed for competitions: a multi-layer woven carbon fiber, double butted spokes and an integral carbon covered alloy hub. We used material only where it is necessary, in other words where there are structural stresses: in this way we have highest performances in stiffness and aerodynamics with an incredible low weight, less than 1400 g.

The wheel is designed for tubular tire in order to enhance the lightness and to aid the rim in absorbing vibrations and shocks.

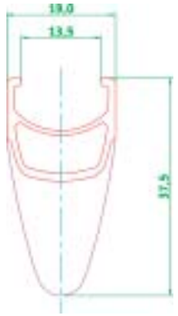
- **Front rim:** multi-layer woven carbon fiber 58 mm high - 18 holes - standard drilling.
- **Rear rim:** multi-layer woven carbon fiber 58 mm high - 24 holes - special drilling: alternatively two right oriented and one left oriented (16 + 8).
- **Front hub:** integral carbon covered alloy - 18 straight holes - sealed bearings.
- **Rear hub:** integral carbon covered alloy - 24 holes (16 on the right for crossed assembly + 8 on the left for radial assembly) - sealed bearings.
- **Front Spokes:** black painted stainless steel, straight head, double butted spokes with anti-rotation system - diameter: 2-1.5-2 mm.
- **Rear right spokes:** black painted stainless steel, straight head, double butted spokes - diameter: 2-1.5-2 mm.
- **Rear left spokes:** red painted stainless steel, straight head, double butted spokes with anti-rotation system – diameter: 2-1.5-2 mm.
- **Nipples material:** brass
- **Tire:** tubolar
- **Weight:** front wheel 593 g
- **Weight:** rear wheel 773 g
- **Other information:** quick-releases: stainless steel axle and black anodized alloy lever made in Italy - 2 years warranty - dedicated brakes pads and bags included.



In this wheel the carbon supports and integrates the alloy, so we can take advantage from the best features of the alloy together with those of the carbon: the carbon fiber is used for increasing the wheel aerodynamics without adding more weight whereas in the alloy structure we created the housing for the clincher and the braking surface.

The wheel is assembled with alloy hub covered with carbon fiber and double butted spokes, red on the left side and black on the right side in the rear wheel to underline the double number of right spokes as regards to the number on the left.

- **Front rim:** silver polished alloy with a bidirectional carbon fiber wing section covering 38 mm high - 20 holes - standard drilling.
- **Rear rim:** silver polished alloy with a bidirectional carbon fiber wing section covering 38 mm high 24 holes - special drilling: alternatively two right oriented and one left oriented (16 + 8).
- **Front hub:** carbon covered black anodized alloy - 20 straight holes - sealed bearings.
- **Rear hub:** carbon covered black anodized alloy - 24 holes (16 on the right for crossed assembly + 8 on the left for radial assembly) - sealed bearings.
- **Front spokes:** black painted stainless steel, straight head, double butted spokes with anti-rotation system - diameter: 2-1.7-2 mm.
- **Rear right spokes:** black painted stainless steel, straight head, double butted spokes diameter: 2-1.7-2 mm.
- **Rear left spokes:** red painted stainless steel, straight head, double butted spokes with anti-rotation system - diameter: 2-1.7-2 mm.
- **Nipples material:** brass
- **Tire:** clincher
- **Weight:** front wheel 925 g
- **Weight:** rear wheel 1135 g
- **Other information:** quick-releases: stainless steel axle and black anodized alloy lever made in Italy - 2 years warranty.

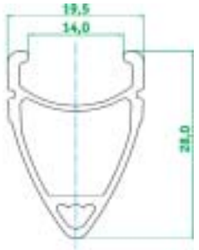


The Visia 28 is the most aggressive ITM's wheel with its "all black" finish. The high stiffness of the aero profile rim allows us to decrease the number of spokes that are straight in order to absorb without problems the high tensions.

The final result is the best compromise between stiffness and capacity in absorbing shocks, so Visia 28 is suitable for the hard amateur competitions.

- **Front rim:** black anodized alloy 28 mm high - 20 holes - standard drilling.
- **Rear rim:** black anodized alloy 28 mm high - 24 holes - special drilling: alternatively two right oriented and one left oriented (16 + 8).
- **Front hub:** black anodized alloy - 20 straight holes - sealed bearings.
- **Rear hub:** black anodized alloy - 24 holes (16 on the right for crossed assembly + 8 on the left for radial assembly) - sealed bearings.
- **Front spokes:** black painted stainless steel, straight head spokes with anti-rotation system - diameter: 2 mm.
- **Rear right spokes:** black painted stainless steel, straight head spokes - diameter: 2 mm.
- **Rear left spokes:** black painted stainless steel, straight head spokes with anti-rotation system - diameter: 2 mm.
- **Nipples material:** brass
- **Tire:** clincher
- **Weight:** front wheel 870 g
- **Weight:** rear wheel 1080 g
- **Other information:** quick-releases: stainless steel axle and black anodized alloy lever made in Italy - 2 years warranty.

In this wheel the braking surface finish is made by turning supplied with a groove used as wear indicator.



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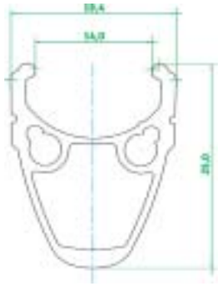
VISIA

The Alu 25 is our entry level wheel: it is assembled with a silver polished 25 mm high alloy rim that assures a high resilience in absorbing vibrations and shocks, standard spokes for the maximum reliability and sealed bearings for a high smoothness; the weight of the wheel is about 2000 g.

The round profile of the rim and the draining groove along the braking surface underline the Alu 25 is perfect for all day trainings and cycle-cross competitions.

- **Front rim:** silver polished alloy 25 mm high - 24 holes - standard drilling.
- **Rear rim:** silver polished alloy 25 mm high - 27 holes - special drilling: alternatively two right oriented and one left oriented (18 + 9).
- **Front hub:** silver polished alloy - 24 straight holes - sealed bearings.
- **Rear hub:** silver polished alloy - 27 holes (18 on the right for crossed assembly + 9 on the left for radial assembly sealed bearings.
- **Front spokes:** stainless steel standard spokes (black painted upon request) - diameter: 2 mm.
- **Rear right spokes:** stainless steel standard spokes (black painted upon request) - diameter: 2 mm.
- **Rear left spokes:** stainless steel standard spokes (black painted upon request) - diameter: 2 mm.
- **Nipples material:** brass
- **Tire:** clincher
- **Weight:** front wheel 940 g
- **Weight:** rear wheel 1155 g
- **Other information:** quick-releases: stainless steel axle and black anodized alloy lever made in Italy - 2 years warranty



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ALU

WHEEL: A BALANCE MIRACLE

Wheel is dinamic soul of bicycle: after frame was suited on rider, no any other component is able to affect more bicycle behaviour. If a good pair of wheels is able to magnify best frame quality, a wrong one is able to extinguish it.

Wheel requirement is strongest that frame's one: we ask for stiffnes during a sprint or a turning, we ask for absorption over an obstacle, we ask for firmness when we are driving inside peloton

But mainly we ask for reliability and safety: it is not a case if wheel is the only bicycle component that UCI (International Cycling organization) requires a specific homologation before to use it on road mass start race and cyclocross

During its building, spoke tension must be tuned up to have a structure centered on horizontal plane (thrueness) and vertical plane (roundness)

To join all these requirements it's really a balance miracle, a challenge that ITM was able to accept...

Ing. Francesco Chichi
ITM Technical Director

Zaniolo CdA - 36.07

ITM
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