

A dose of moly can go a long way

People thought steel was out of the race in cycling performance. But nothing could be further from the truth, thanks to a hidden dose of molybdenum that puts the muscle in new bicycles.



The Parisian Velib'. The renaissance of all-steel bicycles comes with the development of city fleets.

In the ultra-competitive world of professional cycling, doping may allegedly help a competitor to propel the pedals forward, but many have come to regret that choice. By contrast, in the everyday world of recreational and commuter cycling, a little "doping" of the steel used in these bikes brings benefits to all.

To be sure, carbon fibre is the material of choice in the racing world, especially in international races like the Tour de France. Light, strong, and flexible, it's a sure winner in this esoteric world. However, its price puts it out of reach for most users. Outside the professional cycling world, new types of stronger bicycles have been developed for extreme uses: these include mountain bikes which have to withstand the bumps of off-road trails, the "teen" version BMX for skate parks and dirt tracks, and especially the free-service bicycles now appearing in cities like Brussels, Paris, Lyon, Montreal and Melbourne. Bikes are back and are vying for position with the automobile on the streets of our cities.

A highly effective anti-fatigue potion

With this need for stronger bikes, moly-grade steel is also back as a bicycle frame material. Why? Its relative lightness, flexibility, lower price than its all-carbon or aluminium competitors, and its proven robustness combine to make it an ideal material. In fact, chrome-moly steel has become the standard material for city bike fleets designed to resist the hazards of urban riding and improper handling by the occasional rider.

The most highly performing grades (for example CrMo 4130, also called "Cromoloy,") combine chromium, manganese and molybdenum. With 1% Cr and just under 1% Mo, 4130 offers the best combination of performance and cost for components requiring resistance to fatigue failure caused by the repeated shocks of heavy use. It is found in well-known applications like the handlebars (nearly indestructible, curved, ribbed inside, and heat-treated) and the frame. It also replaces aluminium in many other parts where its small weight penalty is less important than price and reliability. This is the case for components like the crankset with its chain wheel; the fork; the brake and gear cables; the chain, bolts, and spokes. Wheels and spokes are the parts most highly stressed and most subject to shock and corrosion, so moly's benefits are most appreciated here.

The comeback of the "All-Steel Bicycle"

So thanks in part to a magic formula containing molybdenum, alloy steel is once again racing ahead in bicycle technology, even if cycling champions aren't ready to trade in their carbon-fibre bikes. Mo is found mostly in the new-look bicycles of city fleets, mountain bikes or BMXs. They are on their way to giving British manufacturer Raleigh's catchphrase "The All-Steel Bicycle" new meaning. But not just any steel is used: it is moly steel we speak of, the only one that really makes the grade.