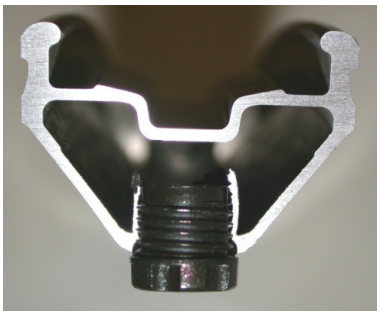
Building a Mavic UST rim



Building a Mavic UST rim will take you approximately twice as long as a conventional rim but many people have successfully built a UST rim as their first build.

A Mavic UST tubeless rim requires some additional tools and it's not exactly the same as previously described for building a standard wheel. This rim does not have standard eyelets; the eyelets are only drilled through the lower rim surface with separately installed nipple cups to hold the spoke nipples.
The photograph shows a cross section of a Mavic UST rim with a nipple cup in place.

Mavic will supply the nipple cups with the rim and their building procedure is very similar to mine.

Tools

You need to purchase a special wrench for the installation of the nipple cups. Two common wrenches are available, one from Mavic (top) and one from Park Tools (code SW-13). My preference is for the Mavic tool because it is faster to use although the Park wrench is just as good, just a little slower.

Note the tightening direction shown on the Mavic wrench (unlock=unscrew), UST nipple cups have a **left hand thread**. Remember this if you ever have to dismantle a UST rim.

My example wheelbuild

In my example I'm building a Mavic XM819 UST rim with 32 holes built 3 cross. Mavic advise 16mm nipples but I use 14mm because there's more than enough protrusion to locate the spoke wrench. Don't try and use 12mm nipples because there's minimal location on the spoke wrench and also a danger of the nipple falling into the rim cavity.

Work out the spoke lengths. To measure the rim ERD I used my standard 12mm measuring tools and located them in the rim using the UST nipple cups gently tightened and the ERD measured 536mm. I measured the hub and popped all the values into my spoke length calculator and it calculated 258.2 and 259.0mm. These lengths are okay for 12mm nipples but because I'm using DT 14mm nipples I need to adjust the lengths (for reasons why see page 60) so I subtract 1mm to get 257.2 and 258.0 and I select 257 and 258 although I could have gone 258 on both sides.

Lacing

Lace everything dry. Do not oil the spoke threads or nipple cups. The reason is you don't want to accidentally get oil on the threads of the nipple cup otherwise the adhesive applied to them after lacing will not work too well. Oil will be applied, but at a later stage.

The lacing procedure is virtually the same as shown in the lacing chapter starting on page 67. Place 8 spokes through the hub, then one at a time place a nipple cup over the spoke and screw a nipple onto the spoke a couple of turns. Thread the nipple cup into the rim just one turn remembering that it is a left hand thread.

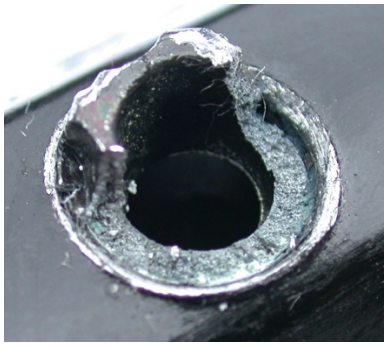
The spokes will not protrude through the rim as shown in *lacing step 3* on page 69 and you need to place the spokes in a tangential direction soon after you start lacing. So after you've placed 3 spokes rotate the hub in the correct direction ensuring the spoke adjacent to the valve hole slopes away from it. Then continue to fully lace the wheel as previously described for lacing a conventional rim.

Glue and tighten the nipple cups

Mavic recommends *Loctite 243* and that's what I use, and a small 10ml bottle is easily available doesn't cost much. With the wheel placed in the truing stand put a small drop of 243 on each the exposed threads of the **nipple cups**.

Then tighten the cups in place. Mavic say use a torque of 5.5Nm, I'm not sure what that feels like but using the Mavic wrench I give it a firm twist (bit ambiguous), watch out if using the Park wrench because there's more leverage on that one and a danger of over tightening.

As a test I tried over tightening a nipple cup on an old rim and it failed with the nipple cup shearing. It took some effort and it was not possible with the Mavic wrench and I had to use the longer leverage of the Park wrench. This nipple cup was the standard issue one that came with the rim, Mavic also make a lighter after-market aluminium version which will no doubt shear with less force than I used here.



Oil the nipples and spoke threads

After tightening the nipple cups you may find the spoke nipples have tightened themselves a little so you might need to loosen some of them to ensure the spoke threads are visible.

Place a drop of oil into the nipple cup and onto the spoke threads. I'm using standard motor engine oil contained in a squeeze bottle.

Give the wheel a spin to distribute the oil.

Tighten the spokes to the same engagement point

Previously we used a nipple driver to take out the initial slack but this is not possible on UST rims. To maintain as much radial trueness as possible you need to tighten the spokes the same amount. Use a spoke wrench to tighten the nipples just enough to cover the exposed spoke threads.

I use a Park four sided wrench (SW-40) for this task because my preferred *Spokey* wrench hides the nipple and makes sighting difficult. As you can see I've modified my Park wrench. I reduced the thickness of the jaws to make the nipples more visible, the original thickness was 5mm and I filed mine down to 3.5mm. I also cut out the plastic grip and filed a small semicircular groove into the underlying metal because the original design fouled the spoke and made placing and removing it a little too slow for my liking. If you tighten the nipples with the spoke in a more horizontal position the modified Park wrench spins real easy as the spoke rests in the cut-out.

Continue to build the same as a normal rim

The details for completing the wheel is exactly as previously described. In this particular example I gave each nipple 3.5 turns to get a little tension in the spokes (I'm now using my Spokey wrench). At this stage it will never be laterally and radially true as a normal rim because I couldn't use a nipple driver (the nipple driver is very accurate at screwing down the nipples to the same engagement point). So expect some error, mine was 4mm out of true laterally and about 1mm out in the radial direction.

UST spoke length check

How do you know the selected spokes were correct? After you initially adjust the nipples to cover the spoke threads keep a count of how many subsequent turns you use in the build process. Then take a spare spoke (with the same length nipple) and screw the nipple to cover the threads then turn it the same amount you used in the build process and see how the spoke end finishes up in relation to the top surface of the nipple. With 14mm nipples it should be about 1mm beneath the top surface. In this example the spokes required 6 turns to achieve full tension and when I checked this on a spare spoke it confirmed the lengths were a good choice and that I could go 1mm longer as an alternate length.

These Mavic UST instructions were written by Roger Musson

For the latest wheelbuilding book please go to:

www.wheelpro.co.uk