Understanding waterproof coating/ratings (in mm) on tent fabrics (referred to as Water Head/Water Column/Hydrostatic Head)

Each manufacturer has their own way to make a tent waterproof, UV resistant and at the same time breathable. The waterproofness of the material is rated in mm and this is a spec you want to look for: Numbers go between 800 mm and 10,000 mm.

The number refers to a water column height in millimeters. For example, 1500 mm means that the fabric will withstand a 1500mm (5') column of water for more than one minute before a single drop might appear through the fabric. **That's strong enough to prevent rain from leaking in a 75 mph hurricane-force storm.**

In the outdoor industry, they use this number as shorthand to describe the amount of coating used to make the nylon or polyester tents waterproof. Some people may also refer to this value as the hydrostatic head pressure.

Any polyester, seam sealed tent with a waterproof rating over 800mm is completely waterproof. BUT, it is better to have a high water column because coatings will wear off, and the waterproofness value will decrease. The British Ministry of Defence definition for a waterproof fabric is that it must resist a column of water at least 800mm high. Most tents start around 1500 which is
substantially higher.

The PU (polyurethane) coating is one of the strongest and most abrasion-resistant kinds of coating, but manufacturers usually don’t tell what coating they use so you'll need to contact them to find out. PU optimizes the waterproofness and strength while still being light-weight. Manufacturers can maximize the amount of coating only to a certain point. More coating means more weight and more cost. Also chemicals in coating weaken the fibers, so at some point, increasing the water column value too much will decrease the fabric strength. This is why 10 000 is the highest value you can find.

The higher the waterproof rating, the more weather resistant your tent is, but less breathable. For family camping in the Summer, Spring and Autumn months, 1000mm -1200mm waterproofing is more than adequate. The only time that you would need a rating above this would be if you were caught in a serious downpour that lasted several days. Waterproof ratings of 3000mm or more are more important when buying a small adventure tent or expedition snow tent, where you will be exposed to harsh conditions.

In summary (based on European conditions):

- 1000mm or less is considered “shower resistant”
- 1500mm is considered the realistic minimum requirement for summer (and mainly dry) camping
- 2000mm is the recommended minimum if you intend camping in your tent year round
- 3000mm is mainly used on family tents so they can withstand a couple of weeks of rain and if you are exposed to harsh conditions, like snow etc.