

Watercooling The ASUS Maximus V Formula

A step-by-step guide on setting up a water cooling system with your ASUS ROG Maximus V Formula *By Wan Hezy and CHIP Team*

The ASUS ROG Maximus V Formula is a monster of a motherboard that has tonnes of great features, and one of them is their new VRM cooler called the Fusion Thermo Solution: the world's first hybrid air-and-water cooling thermal design. FTS covers the entire VRMs from end to end, giving us the option to go with air cooling or water cooling right out of the box.

This guide will show you how we take advantage of the FTS' water cooling capability, the components needed, and as much of the HOW TOs and DON'Ts of water cooling. Ladies and gentlemen, we bring you the ROG POSEIDON.

COMPONENT SELECTION

The main components for a water cooling system/loop are the water blocks, pump, radiator, reservoir, tubes and a handful of fittings. For this guide, we will be cooling the processor, the graphic cards and the motherboard.

We picked the best components to ensure optimum cooling performance of the system. They are:

(i) **Processor Water Block** – EKWB

Supremacy HF CPU Water Block

(ii) **Graphics Card Water Block** – EKWB EK-FC GTX 680 DCII

(iii) **Motherboard Water Block** – ASUS ROG Maximus V Formula Fusion Thermo Solution

(iv) **Pump** – Swiftech mcp 355

(v) **Reservoir** – Bitspower International Z-tank Red

(vi) **Radiator** – EKWB Coolstream XT360(3 x 120mm fans) and EKWB Coolstream XT 240(2 x 120mm fans) radiator

(vii) **Fitting** – Bitspower International Premium 3/8-inch fittings

(viii) **Tube** – 3/8-inch ID 5/8-inch OD Tube

With three major PC hardware on water cooling, a lot of heat will be dumped onto the liquid. We overcome this by using 2 radiators instead of one. This would require larger casings; in this case, we picked Bitfenix's Shinobi XL

Window Version, which is designed for massive water cooling systems.

Also, the more water cooling blocks and radiators there are in the system the higher the restrictions are, which will impede fluid flow. Thus, we chose the mcp355 pump which has a high head pressure to blast the fluid thru the loop.

A. INSTALLATION AND ASSEMBLY



1. CPU Water Block Installation:

The mounting of the CPU water block is similar to most CPU coolers. Mount the backplate onto the back of the motherboard. Apply thermal paste on the processor and fasten the water block with the bundled screws and washers.

Important Note: Always strictly follow the instruction manual, and make sure that the block orientation is correct.



2. Motherboard Water Block:

With other motherboards, we would normally need to disassemble the stock heat sink and fix in the block onto the motherboard. This requires a lot of time and expertise, as any error in installing the block might lead to a broken cap

or pin. The cost for an after-market motherboard waterblock can also be expensive.

With the Maximus V Formula, you will find that the board requires no disassembly, as it is pre-fitted with its own waterblock. ASUS Fusion Thermo Solution even has its own pair of pre-installed electroplated nickel barb fittings. Plus, the 100% copper channels, electroplated nickel barb fittings and 3/8-inch barb size are all current industry standards for water cooling.



3. GPU Water Block Installation:

Unscrew the stock cooler of the card and carefully separate it from the graphics card. A little wiggling is needed, as even without the fasteners, the thermal paste on the card usually sticks the stock cooler to the card. With the cooler out, carefully place the thermal pads on the card VRMs, and apply a fresh coat of thermal paste onto the GPU before placing the water block. Carefully mount the waterblock onto the card and fasten all the screws.

Important Note: Use moderate strength when tightening the fasteners, and avoid using any kind of electrical tools. Having the fasteners too tight will warp/bend the GPU.

4. Radiators, Reservoir and Pump

Next is mounting the 120mm case fans onto the radiators. We used five 120mm fans: three for the 360mm radiator and two for the 240mm radiator. Place and mount the radiators in the case using the available fan mounts. Place the reservoir



next to the motherboard, where there is enough space to fasten it on. The pump will fit nicely in the 5.25-inch drive bay.

Important Note: Take care to not over-fasten the fans, it as you might accidentally puncture the radiator. Radiators often come with its own set of fasteners or screws, usually at the right length, but check them anyway. Most leaks in a water cooling setup are caused by negligence.

5. Fittings, Tubes and Flow Direction

Fittings used in the assembly are the 3/8-inch barbs and 3/8-inch compression fittings. Fasten a pair of fittings onto each of the water cooling component and make sure they are tightly secured. Use plug fittings to close up any free outlets. Next is to plan the flow direction of the would-be loop. For this build, the arrangement was set at [Reservoir > Pump > 240mm Radiator > 360mm Radiator > Graphic Card water block >



ASUS Fusion Thermo block > Processor water block].

Once the direction is set, start measuring the length of tubes needed from one component of the loop to the next. After making sure there were no kinks on each tube, cut them in length. Make sure that you have a clean cut on each ends of the tubes. This is to ensure that the ends rest the flush on the fittings. Failing this will result in leaks later on.

Important Note: Unless you are using a Reservoir-Pump Combo, the position of the water cooling components in the flow direction is not really crucial, except for the reservoir and pump. It is very important to make sure that the pump is placed after the reservoir. This is to ensure that during the filling process, the pump (when it is turned ON) would have continuous water supply from the reservoir. The ULTIMATE RULE of water cooling: the pump must not run when there's no water coming into it. Running it dry during filling will kill it!

B. FILLING THE LOOP AND LEAK TEST

Before you start the filling process, make it a point to check that all of the fittings are tightly fastened, and the tubes are flushed and secured. Place paper towels at key areas on the PC hardware. Check that the PSU is NOT connected to any of the PC hardware, and use a special jumper on the PSU 24 pins so that it will turn ON even without any connection to the motherboard. The water cooling pump is powered via a 4 pin molex, and this is the only component connected to the PSU. You just need power only to the pump and nothing else.

Use a non-conductive fluid that's



made for PC water cooling. Having non-conductive properties, the fluid would not damage the PC hardware if you were to have any accidental spillage. Fill the reservoir HALF FULL with the fluid, and turn ON the PSU. The pump will suck the reservoir dry and push the fluid into the loop. When this happened, turn OFF the power immediately. As mentioned, the pump can't run without fluid going thru it. Repeat the filling step, making sure continuous fluid is being supplied to the pump and continue until the loop is completely filled. At the same time, it is best to check for leaks. Once you have observed everything is fine with the new loop, allow the system to run for a few minutes. Now you are ready for overclocking! 📺

