
Subject: Speaker Voice Coil Cooling System Valve
Posted by [Wayne Parham](#) on Mon, 27 Jun 2005 22:26:45 GMT
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The prototype valve for the speaker voice coil cooling system is in my hands, ready for testing.

Voice Coil Cooling Valve

Cooling Valve Inserted in Speaker Magnet

The prototype is longer than production versions will be, and it is also slightly larger diameter. If it proves to work well, we'll streamline the device and make it smaller and easier to fit inside loudspeaker cabinets.

Voice Coil Cooling Valve Input

Voice Coil Cooling Valve Output

You can see the shape of the orifices inside the fitting in these photos. Unidirectional flow is created because each duct makes airflow turbulent in one direction, impeding flow in that direction. Airflow is laminar going one way and turbulent the other. That makes it much easier to flow one way, and by using two ducts, a warm air outlet and cool air inlet are formed. You would be surprised how effective this is. The difference in flow is immediately obvious, even when just putting your hand over the ducts and feeling gusts of air.

The next step is to connect pipes to the fitting and install an intercooler. There are a two pressures to balance: The volume of air inside the ducts and the volume of air behind the speaker cone. Each of these will contribute to cooling effectiveness and to system tuning. The rear chamber volume will be increased by a small amount due to the additional volume in the cooling system. This will reduce fb. Also, the volume of the cooling system should be large enough that flow is encouraged instead of pressure.