As a result of the devastating fire events in the transalpine tunnels at the turn of the millennium, the EU Tunnel Directive (2004/54/EC) was developed. The Directive provides that the distances between the emergency exits shall not be more than 300 m. The national implementation of the Directive in Germany was the Guidelines for the Equipment and Operation of Road Tunnels (RABT) 2006. The stipulations in the RABT created the re-equipment needs of the - at that time - round about 200 existing federal road tunnels. To ensure the lower emergency exit distances several cross passages, rescue shafts and – since about 50% of the existing tunnels are operated bi-directionally – rescue tunnels had to be build.

In order to build the rescue tunnels the most economic way while securing the usability of the construction a research project was awarded by the Federal Highway Research Institute (BASt). The research conductors (Ruhr University Bochum) developed a shotcrete which is so impermeable to water that on the inner surface moist can only be found occasionally and locally limited. Furthermore cracking can be avoided because of the low shrinkage behavior. The proceedings of this project led to new regulations in the German Additional technical terms of contract and guidelines for civil engineering works (ZTV-ING). Depending on the hydrogeological conditions the standard construction method for rescue tunnels is now a single shell of shotcrete.

Since lots of rescue tunnels are completed and under operation in the last years numerous experiences were gained in the public road authorities. This paper will put this experiences together and will mark up the requirements, challenges and limitations of the construction method. Using current examples it will attempt to demonstrate the technical conditions needed for a quick and secure construction of rescue tunnels.