

About ETSI

Standards for GPR and WPR form part of ETSI's extensive output. ETSI is one of the world's leading standards development organizations for Information and Communication Technologies (ICT). Founded initially to serve European needs, ETSI has grown rapidly to become highly-respected as a producer of technical standards for worldwide use. In addition to our global focus, ETSI is formally recognized by the European Union as a European Standardization Organization.

ETSI membership is composed of manufacturers and network operators – all the “big names” and many smaller companies too – plus national administrations, ministries, regulators, universities, research groups, consultancies and user organizations. A powerful and dynamic mix of skills, resources and ambitions, all working together to bring the very best ICT solutions to the global marketplace. Geographically, our membership of over 700 companies and organizations is drawn from more than 60 countries on 5 continents.

ETSI is independent of all other organizations and structures, a key feature for ensuring neutrality and trustworthiness. That brings benefits not only in the acceptance of our standards and other publications, but also in our growing range of ancillary services, such as interoperability testing. And because standardization inevitably draws upon the bright ideas of our members, we have an Intellectual Property Rights (IPR) policy in place that has become the model for many other organizations.

ETSI's standardization activities are open to all interested companies and organizations. Your company can be part of this dynamic organization. For more information about how *you* can be involved, please visit

<http://www.etsi.org/membership>

For details about ETSI's current activities in support of GPR/WPR, please visit

http://portal.etsi.org/erm/ERMtgUWB_ToR.asp

or contact

ERMsupport@etsi.org

The European GPR Association

The interests of the GPR/WPR industry in Europe are represented by the European GPR Association, which is a Member of ETSI. The Association works with the authorities of the European Member States to develop licensing frameworks for equipment and users. It also provides training and the development of professional guidance across all spheres of activity for which GPR/WPR is used.

For further details visit www.eurogpr.org

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World Class Standards

Ground Penetrating Radar & Wall Probing Radar



www.etsi.org

Ground Penetrating Radar (GPR) & Wall Probing Radar (WPR)

have a unique capability to reveal hidden and buried features not revealed by any other technology. GPR and WPR are in current daily use across Europe in a wide range of applications, many of which are designed to provide national governments with key management information concerning infrastructure, antiquities and many other national resources. **However, the main purpose behind the deployment of the technology is almost invariably safety.**



Image source: European GPR Association members

Safety applications

The largest single market for GPR operation is the detection of buried pipes & services, often in advance of construction or infrastructure renewal. It is generally accepted that it is not sufficient to rely on records alone. The consequences of not deploying GPR are potentially enormous both to life and to the related financial impact.

Another common use of GPR/WPR is the verification of road and bridge deck integrity and the determination of the position and quality of reinforcement within concrete. GPR is used to monitor the condition of highways at traffic speed in order to plan road maintenance. Similarly, GPR is used to record and monitor the state of airport runways & taxiways.

GPR is also used on a daily basis to locate other potential hazards such as underground cavities, vaults, tunnels and uncapped mine shafts. In all cases, safety is the primary impetus for the investigation and the potential impact of either not surveying, or doing so inadequately, is grave both financially and in terms of lost human life.

Environmental and cultural applications

GPR is also an important tool for the investigation of the environment (e.g. glaciers, Quaternary deposits, wetlands), for mineral exploration and also for the location and extent of buried archaeological remains. Here again, safety is an important driver, for example in glaciology and in mining where it is used to detect fractures and water pockets on the excavation front and tunnel vaults. Safety alone is not necessarily the primary impetus for using GPR technology. In the case of mineral exploration (e.g. mining, peat harvesting), the principal reason for using GPR is the economics of exploitation.

For archaeological investigations, preservation of cultural heritage is generally of prime importance, since unnecessary damage can be prevented by intelligent use of GPR/WPR. Financial considerations may also be a factor in the deployment of GPR, for example in the case of otherwise inaccessible remains, or for the rapid definition of extant remains over a large area.

Forensic applications

GPR is used extensively for forensic work, assisting Member States' police forces in the finding of human remains, concealed illegal weapons and arms caches. A very important development of GPR technology is its use to detect anti-personnel mines, a major scourge in at least sixty seven countries.

ETSI standards for GPR and WPR

GPR and WPR are transmitting devices, normally classified as Ultra Wide Band (UWB) devices. As such, GPR/WPR equipment is subject to European regulation on UWB equipment, for which several *ETSI* standards provide the technical basis:

- European Standard EN 302 066-1 and -2. A Harmonized Standard for GPR/WPR which is cited in the Official Journal of the European Community (OJEC) and thus a means of demonstrating conformity to Article 3.2 of the European Commission's R&TTE Directive (1999/5/EC)
- European Standard EN 301 489-32. An *ETSI* electromagnetic compatibility (EMC) Harmonized Standard, also cited in the OJEC and a means of demonstrating conformity to article 3.1b of the R&TTE Directive
- *ETSI* Guide EG 202 730 containing a Code of Practice for GPR/WPR (this supersedes an earlier version in *ETSI* Technical Report, TR 102 554)
- *ETSI* Technical Report TR 101 994-2. A System Reference Document upon which a CEPT Electronic Communications Committee (ECC) Decision for GPR/WPR (ECC/DEC/(06)08) has been agreed. This Decision, which provides the basis for a harmonized approach throughout Europe with regards to the regulatory environment for GPR/WPR imaging systems, has been incorporated into EN302 066-1 and -2.

Written by the industry for the industry, all of *ETSI's* published documents may be downloaded **free of charge** from <http://pda.etsi.org/pda>