

THE ACCREDITATION OF THE TESTING ACTIVITIES OF TESTING LABORATORIES, CONSULTING ENGINEERS AND TECHNICAL EXPERTS - A CONTRIBUTION TO INCREASE TRUST AND REDUCE TRADE BARRIERS IN UNITED EUROPE

DIE AKKREDITIERUNG DER PRÜFENDEN TÄTIGKEIT VON PRÜFLABORATORIEN, INGENIEURBÜROS UND SACHVERSTÄNDIGEN - EIN BEITRAG ZUR VERTRAUENSBIILDUNG UND ZUM ABBAU VON HANDELSCHRANKEN IM VEREINIGTEN EUROPA

L'ACCREDITATION DE L'ACTIVITÉ D'ESSAI DE LABORATOIRES D'ESSAI, DE BUREAUX D'INGENIEURS ET D'EXPERTS - UNE CONTRIBUTION POUR INSPIRER CONFIANCE ET RÉDUIR LES BARRIÈRES COMMERCIALES DANS EUROPE UNIFIÉ.

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### **Summary**

In order to complete a uniform market in Europe it is necessary that its member nations grow together in various fields of activity. This requires also that the criteria of assessment for the testing activities become uniform. The accreditation, on the basis of the European Standard EN 45 001, requires far-reaching measures of quality assurance, transparency of the technical responsibility for tests and documentation of the technical and organisatory events and, thus, their complete traceability. Accreditation means the formal recognition of the competence to carry out specific tests. The German accreditation system has a dual structure and unifies accreditation authorities of mandatory as well as voluntary areas. By its sectorial structure it takes profit from the general knowledges of all relevant institutions of research, industry and administration. FMPA prosecutes an autonomous assessment institution in the DAP (German accreditation system for testing), puts the competence of its personel in various fields at the disposal of accreditation system and, thus, contributes to the completion of a unified Europe.

### **Zusammenfassung**

Die Schaffung eines gemeinsamen Marktes in Europa erfordert das Zusammenwachsen der Mitgliedsstaaten auf den verschiedensten Gebieten. Dazu gehört auch die Vereinheitlichung der Bewertungskriterien für das Prüfwesen. Die Akkreditierung auf Grundlage der Europeanorm EN 45001 erfordert durchgreifende Qualitätssicherungsmaßnahmen, Transparenz der technischen Verantwortlichkeit für Prüfungen und vollständige Dokumentation der technischen und organisatorischen Abläufe und damit deren vollständige

Rückverfolgbarkeit. Akkreditierung bedeutet die formale Anerkennung der Kompetenz, bestimmte Prüfungen auszuführen. Das deutsche Akkreditierungssystem ist dual strukturiert, vereint sowohl Akkreditierungsstellen des gesetzlich geregelten als auch des nicht geregelten Bereiches. Durch den sektoriellen Aufbau nutzt es die Sachkompetenz aller relevanten Institutionen aus Forschung, Industrie und Verwaltung.

Die FMPA betreibt eine autonome Begutachtungsstelle im Deutschen Akkreditierungssystem Prüfwesen (DAP) und stellt damit das Fachwissen ihrer Mitarbeiter auf weitgefächerten Arbeitsfeldern in den Dienst des Akkreditierwesens und trägt somit bei zur Schaffung eines vereinigten Europas.

## **Résumé**

Pour créer un marché unique en Europe il est nécessaire que les nations membres se trouvent ensemble sur les domaines les plus différentes. Ceci demande aussi que les critères d'évaluation deviennent uniformes. L'accréditation sur la base du standard européen EN 45001 demande des mesures importantes d'assurance de qualité, la transparence de la responsabilité technique pour les essais et la documentation des événements techniques et organisatoires et donc, leur pouvoir complet de reproduction. Accréditation signifie la reconnaissance formelle de la compétence de réaliser d'essais déterminés. Le système allemand d'accréditation a une structure duelle et unifie l'accréditation réglée par loi, ainsi que le domaine non-réglé par loi. Dû à la division en secteurs on peut profiter de la compétence de toutes les institutions importantes dans le domaine de la recherche, l'industrie et l'administration.

FMPA mène une institution d'évaluation autonome dans le DAP (système d'accréditation allemand dans le domaine des essais) et met la compétence de son personnel dans les domaines les plus variées à la disposition du système d'accréditation et contribue ainsi à la création d'un Europe unifié.

**Keywords:** Single Market, Accreditation, Testing, assessment, quality assurance

## **1. THE UNIFIED EUROPE**

In order to create a uniform market in Europe it is necessary that the member states grow together in various fields of activity. Existing trade barriers have to be eliminated as far as possible. This applies also to an harmonization of the assessment criteria for testing. The European standards define the test as a technical procedure composed of the determination of one or several

characteristics of a definite product, process or service and which is carried out according to a specified procedure.

During the last years testing procedures have become more and more important in all phases of production, preparing of production and the certification as a confirmation of the conformity of the products for instance with the requirements of the harmonized EN-standards. All types of services have been included into these procedures. In order not to erect technical trade barriers in these fields of activity it is necessary to attain an European or better a global acceptance of test-reports and certificates for the clients and governmental bodies in the mandatory area which were established by certain testing laboratories, consulting engineers or technical experts and certification bodies. This may be done by the accreditation on the basis of the European standards of the series EN 45001 and following. Accreditation means the formal recognition of the competence to carry out specific tests and specific types of tests basing upon a qualified assessment of exactly specified procedures and organizational structures. This may relate upon the definition of characteristics by maintaining exactly specified procedures; and moreover upon the competence to chose such procedures from a field of testing area and to apply them and, in the future, even upon the competence to define characteristics with new procedures.

The fundamental resolution to erect the European market has been made in 1987 with the "EEA" (uniform European document). Art. 8a says that "the Community takes measures to create gradually until December 31, 1992 an inland market. This market covers an area without borders, in which the free traffic of products, persons, services and capital according to the stipulations of this treaty is guaranteed". The EC with its 320 mio. inhabitants represents the biggest closed market of industrialized states. Furthermore there are 30 mio. inhabitants of the EFTA-states with whom close economic relations were maintained, for instance by export. The importance of the CE-market and the EFTA for the German economy may be shown upon the export statistic of the Federal Republic for 1987 (fig. 1) according to which 70 % of the exports went into the European countries.

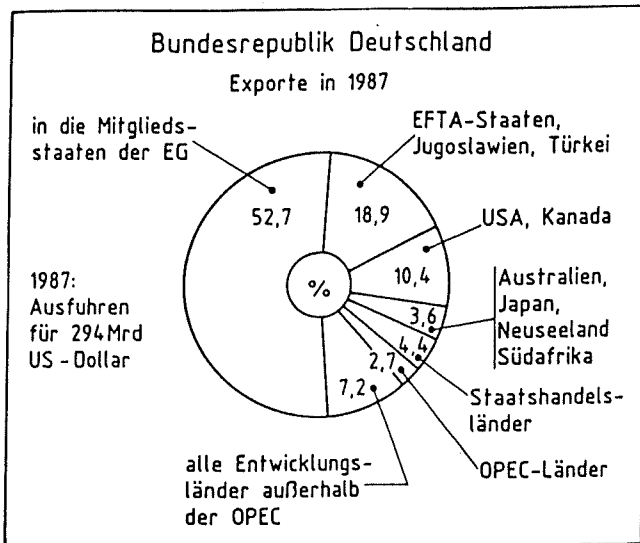


Fig. 1

The technical trade barriers may be surmounted by three measures:

1. Issuing of harmonized CE-guidelines. The CE-guideline is a general outline law of the CE which doesn't immediately apply to the member states but which obliges them to fulfill certain aims within certain limits and with the means of national law. These are fundamental requirements to the products brought into circulation with stipulations concerning the realization of conformity assessing methods. Furthermore they contain conditions imposed to the authorities to recognize the conformity proofs of other member states.
2. Creation of European standards. They serve to concretize the fundamental technical requirements from guidelines and cause, by the identity of the wording, a reciprocal recognition of the regulations of the different states.
3. Creation of accreditation -, testing - and certification structures. Thus, the reciprocal approach of the member states and their systems within a voluntary area is promoted and a cooperation in expert organizations is reached.

## 2. EXCHANGE OF PRODUCTS AND SERVICES WITHIN A MANDATORY AND VOLUNTARY AREA

"Mandatory areas" are areas where the circulation of products, their fabrication and use, the realization of services or tests are regulated by laws or stipulations similar to laws, in order to protect the citizen from dangers for their life and health or other important disadvantages. In practice this is the area in which by Federal or State's laws tests or certifications are required which only have to be carried out by competent bodies which, for this purpose, have an official recognition, admission or nomination. The so-called notification area is a part of this regulated area. Institutions of the Commission of the EC which, on behalf of the CE-guidelines, may carry out the required procedures for stating conformity have to be indicated there. "Voluntary areas" are those areas where products are produced and brought into circulation, as well as services and tests are carried out on the basis of private-law contracts.

The European standard series EN 45001 and followings formulate the requirements to the bodies which performs tests and the authorities which grant these accreditations. Furthermore it regulates the accreditation procedure. The standards of this series are quality-assurance-standards.

For the first time they exceed by far, in the field of testing, the general requirements in the known quality assurance standards of the series ISO 9001 and followings and DIN EN 29001 and followings. In contrast to these standards, EN 45001 and followings contain subject-specific requirements of testing. Initially these standards were meant for the voluntary area and were mainly applied in this area. But the systematic procedure and unusual concretisation of the events have led to an extreme approach between the mandatory and voluntary regulated area in various fields. This process will more and more continue. There exist some intersections of the two areas. In order to avoid double accreditations, in principle, five ways of approaching are possible:

1. Common expert commissions will be found which establish common bases for tests.
2. Common accreditation rules will be established.
3. The government assessors will be involved into the accreditation procedure in the voluntary area.
4. Government bodies will be involved into the steering committees of accreditation systems in the voluntary area.
5. The private accreditation procedures (in the voluntary area) will be used for government accreditation.

All indicated ways were used and are successful.

### 3. THE GERMAN ACCREDITATION SYSTEM

The above described operation shows an essential characteristic of the German accreditation system. The system has a dual structure. The German accreditation system comprises the mandatory as well as the voluntary area within the DAR Deutscher Akkreditierungsrat (German council of accreditation) supported in common by the Federal government, the states and the German economy. To the DAR belong, in equal parts, members of the mandatory and private field, one representative of the Bundesministerium für Wirtschaft BMWi (Federal ministry of trade and commerce), the Bundesministerium für Arbeit und Sozialordnung BMA (Federal ministry for work and social order) and the German institute for standardization DIN. The federal emblem the Bundesadler (eagle) has been granted to DAR to be used on the uniform accreditation documents.

The DAR fulfills the following tasks:

- coordination of the activities carried out in Germany in the field of accreditation and recognition of testing and calibration laboratories, certification and supervising bodies.

- Observing of the German interests in national, European and international institutions which deal with general questions of accreditation or recognition (for instance ILAC, WELAC, WECC, EAC, EOTC).
- Keeping of a central German accreditation- / acceptance register

As far as the mandatory area is concerned the following bodies are member of the DAR:

- ZLS Zentralstelle der Länder für Sicherheitstechnik (central body of the "Länder" for safety )
- IfBt Institut für Bautechnik (federal institute for the building sector)
- ARGEBAU (supreme building authority)
- authorized bodies of the "Länder" for the calibration
- authorized bodies of the "Länder" for determining emission / immission
- accreditation office of the Federal Ministry for postal affairs and telecommunication

For the voluntary area:

- TGA (german association for accreditation)
- DAP (german accreditation system for testing)
- DATech (german accreditation body for electrical engineering)
- DEKITZ (german coordinating body for IT-conformity testing and certification)
- DAM (german accreditation body for metal)
- DASMIM (german accreditation body for mineral oil)
- DASET (german accreditation body for steel-construction and energy technics)
- DKD (german calibration service)

In the voluntary area most of the accreditation bodies were joined since 1990 in the Trärgemeinschaft für Akkreditierung GmbH (TGA). Members of the TGA

are the big industrial bodies in Germany. TGA coordinates the activity of the accreditation bodies gathered in it, with the exception of the Deutscher Kalibrierdienst DKD (German calibration service). TGA only accredits in two cases:

- acceptance of certification bodies for quality assurance systems
- acceptance of certification bodies for personnel

This structure of the German accreditation system shall profit from the experiences of the German industry, the authorities and other institutions for the acceptance of laboratories, testing offices, controlling communities and certification bodies but shall guarantee a high knowledge of the subject of the accreditation bodies by the cooperation of all highly qualified institutions basing upon a sectional structure.

The accreditation bodies in a voluntary area work in special fields and try to avoid reciprocal intersections of their activities.

DAtech works especially in the field of electrotechnics. As for the others, the field of work may be derived from their designation. The DAP is the most universal accreditation system and is working on, or has already terminated, the biggest number of accreditations.

#### 4. THE GERMAN ACCREDITATION SYSTEM FOR TESTING PROCEDURES DAP

The DAP originates from the accreditation system BAS established by BAM Bundesanstalt für Materialforschung und -prüfung (Federal body for materials research and testing).

The parent organization of the DAP is VMPA (union of materials testing bodies) which prosecutes the administrative office of the DAP. Today the VMPA has more than 35 materials bodies offices and other institutions as members. Thus, it is possible to make usable all knowledges gathered from various working fields

and specific knowledges gathered by testing. Fig. 2 shows the organization system of the DAP. The federal filling of the committees in the system prevents an one-sided execution of the accreditation procedures. The decentralized working structure of the DAP may be seen by the fact that seven members of the VMPA prosecute independent expert assessment offices:

- BAM - assessment body - Berlin, BBS
- FMFA - assessment body - Stuttgart, FMFA-BSA
- Landesgewerbeanstalt Bayern, Nürnberg
- Materialprüfungsamt Nordrhein-Westfalen, Dortmund
- Begutachtungsstelle der Gütezeichengemeinschaft zerstörungsfreie Prüfung, GBS, Stuttgart (assessment body of NDT-community, GBS)
- Begutachtungsstelle des Verbandes der Technischen Überwachungsvereine BS-TÜV Essen (assessment body TÜV)
- Landesmaterialprüfungsanstalt Sachsen-Anhalt, Magdeburg (materials testing body)

These assessment bodies carry out independently accreditation procedures until the recommendations for accreditation after all conditions were fulfilled, moreover they acquire new applicants. The accreditation itself is pronounced, enlarged, modified or withdrawn by the federally structured committee for accreditation (AfA). Orientated according to the technical necessity from the existing accreditation procedures eleven expert committees were created covering the working areas chemistry, non-destructive-testing NDT, food chemistry, mechanical-technological testing, analysis of air pollution, welding technique, fire protection, testing of consumer items, measuring procedures in testing technique, noises and vibrations as well as marine techniques and wind energy. It is their task to establish expert rules for accreditation, the pursuance of the regulations in the system, the formulation of requirements to the assessors, the

# DAP Deutsches Akkreditierungssystem Prüfwesen

Stand 09/92

Träger: Verband der Materialprüfungsämter e.V. (MMPA)

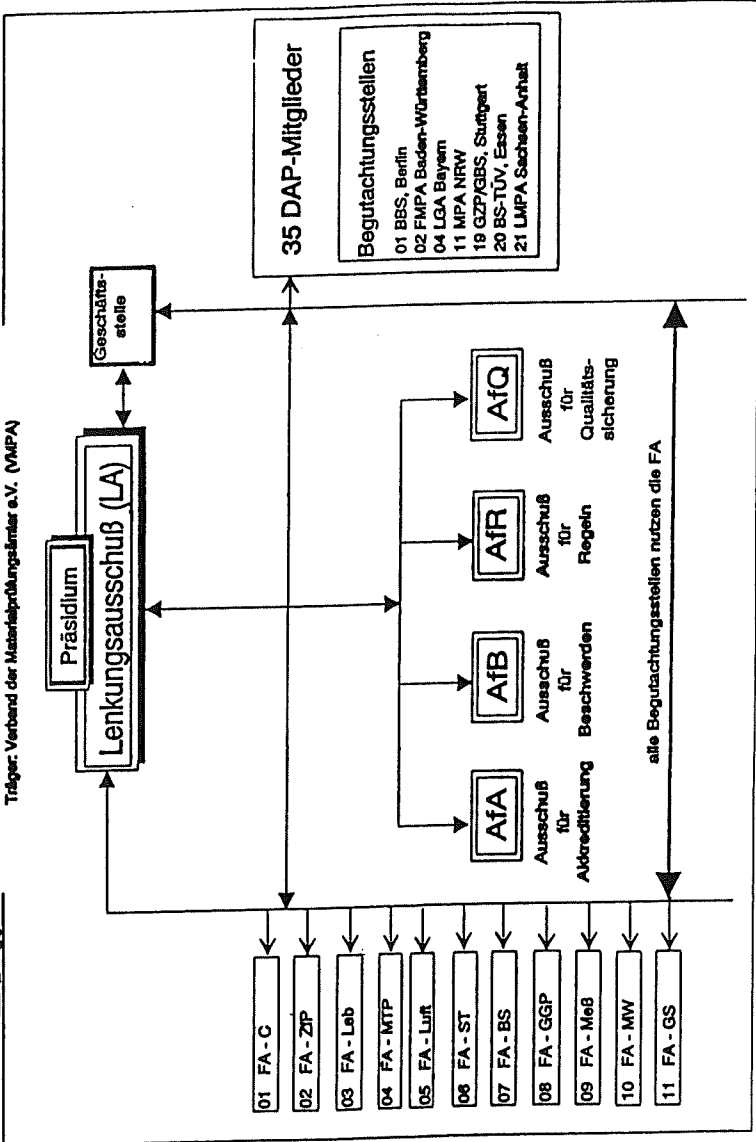


Fig. 2

establishment of assessor lists and of checklists for assessing procedures of laboratories in their special field. The members of the committees were nominated only on behalf of their competence not regarding their affiliation to organizations.

Accreditation requires that the applicant takes technical and organisatory provisions for guaranteeing the quality of the tests carried out and for the complete traceability of every step of the testing procedures. As a part of the accreditation the laboratory is inspected by the assessor on the site. By these measures the consequence of an incorrect testing or errors in the choice of testing equipment may be stated. In most cases the result is a clear increase of the quality level of testing activity. The comparability of the tests is reached. In the long term, the trust in testing activity will grow. Even for carefully working and reliable laboratories the procedure of accreditation reaches still an improvement of the organisation and the quality assurance. The DAP, as accreditation body, may not be seen as a controller for the laboratory, but as a partner which, together with the laboratory, creates the accreditation ability by consulting during the preparation of accreditation. The advantages of an accreditation are obvious:

- Improvement of the access to the EC - inland market.
- Increase of quality level by knowledge- and technology transfer.
- Facilitating of export to non EC - countries.
- Avoid of repetition tests by accepting the accreditation issued by other testing institutes; par example for export.

It is the aim of the FMPA to be a partner for both research institutes and industry. The accreditation of the testing laboratories, consulting engineers and technical experts belongs to its task. At the moment, this field of work is expanding immensely. Doing this, the FMPA makes an essential contribution to an unified Europe.