

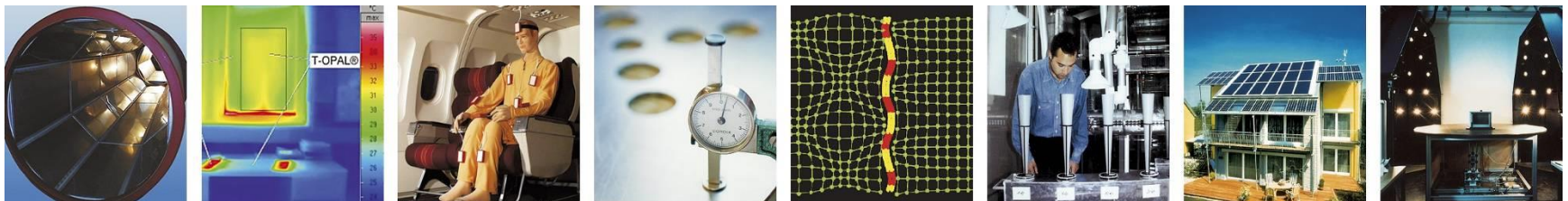
Examples of Technical Procedures to obtain and prove good Quality of the Work



Hans Erhorn, Fraunhofer Institute for Building Physics

QUALICHeCK Webinar
A Guide for Policy Makers
for developing better Frameworks for Quality of the Works

23 February 2017



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German Building Industry: Survey performed by BauInfoConsult



Ca. 10% of the total German building costs are related to construction defects!
Comparable values in France

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Source Book „Analysis of the Reasons for good/poor Quality of the Works and Documentation of possible Best Practice Approaches “



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Extract of content:

3. Analysis of reasons for good/poor quality of works
4. Overall philosophy regarding improved boundary conditions for a better quality of the work
5. Documented set of best practices Part 1: Procedures to obtain and prove good quality of the works
6. Documented set of best practices Part 2: Robust legal procedures for handling non-compliance
7. Documented set of best practices Part 3: Operational framework for better compliance and effective penalties related to quality of the works

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Report: Documented Examples of existing Situations regarding Quality of the Works





"Towards improved quality of the works"
Documented examples of existing situations regarding quality of works



Draft report for discussion with stakeholders, 30 October 2014
(A final report, including information from other experiences and feedback from stakeholders, is planned to be published in September 2015)

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Reasons for poor quality:

1. **Poor specifications** at level of projects, standards, regulations:
 - a. Materials to be used (e.g. material characteristics of insulation, correct construction details (joints), ...)
 - b. Performances to be achieved (e.g. air- and watertightness, wind resistance for PV panels, acoustical performances of ventilation systems, ...)
 - c. With respect to the execution principle (e.g. under which conditions may roofing be installed)
2. **Lack of competence**
 - a. Designer level (see also QUALICheck work package "Reliable and easily accessible input data")
 - b. Execution level
 - c. Language barriers
3. **Critical economic conditions**
 - a. Critical financial conditions
 - b. Critical timing conditions
4. **Lack of control**
 - a. By parties involved in the project
 - b. By third parties (government, independent control organisations, ...)

Source Book „Analysis of the Reasons for good/poor Quality of the Works and Documentation of possible Best Practice Approaches “



5. Documented set of best practices Part 1: Procedures to obtain and prove good quality of the works
 - 5.1 Clear descriptions and work specifications
 - 5.2 Clear description of the procedures to show evidence of compliance
 - 5.3 Tracing procedures
 - 5.4 Handling of innovative solutions
 - 5.5 Usability of the specifications in practice
 - 5.6 Consider simpler on-site compliance procedures for meeting compliance criteria at system level
 - 5.7 Consider simpler on-site compliance procedures for companies meeting compliance criteria at company level
 - 5.8 Rewarding good practice
 - 5.9 Specific issues for existing buildings
 - 5.10 Quality management approaches
 - 5.11 Market surveillance and integrating lessons learned
 - 5.12 Interrelation with European and national legislation and standards

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Clear Descriptions and Work Specifications: Interesting Examples



- Swedish AMA General material and workmanship specification system
- German guideline on accepted rules of technology for installing windows and front door by industry initiative Gütegemeinschaft Fenster und Haustüren e.V.
- German STL-Bau specification system (Standardleistungsbuch für das Bauwesen)



Training and Certification Schemes for Installers at AIT (Austria)



- Accredited certification body: AIT – Austrian Institute of Technology

System	Training since	Accreditation since
Heat pumps	2001	2005
Solar thermal	2004	2009
PV	2006	2009
Ventilation	2007	Not yet



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- Comprehensive training is complemented by option to obtain certification
- Certificate is voluntary, but recommended in sustainable building guidelines of klimaaktiv programme
- Certificate is visible sign of strong commitment to quality, competitive advantages
- Certificate is valid for 3 years, then re-certification necessary
- Certified heat pump installer, solar heating installer and planner, solar heating practitioner, photovoltaic installer and planner
- > 2500 participants have successfully completed the training courses (by end of 2014)
- Training modules: 5 – 8 days plus 1 day for examination
- Costs: 1,400 – 1,450 € plus 120 – 200 € for examination

UK Quality Framework CIGA for Insulation of Cavity Walls



- Cavity Insulation Guarantee Agency (CIGA)
- Established in 1995
- Provision of 25 years guarantee for cavity wall insulation fitted by registered installers in the UK
- Residential and non-residential buildings
- List of system designers and installers
- Guarantee covers defects in material + workmanship
- Since 2013 „hard to treat“ cavity insulation guarantee for homes with > 3 storeys or walls with narrow cavities
- CIGA HTT Guarantee was issued for nearly 130000 home owners within 2013



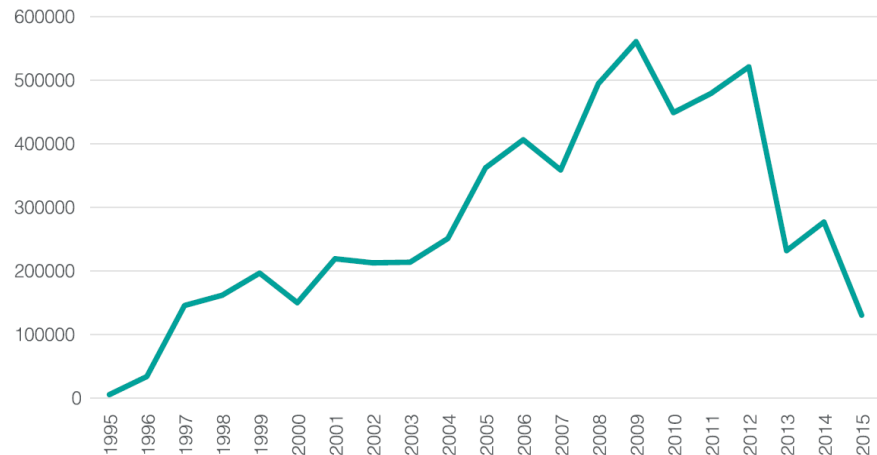
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UK Quality Framework CIGA for Insulation of Cavity Walls

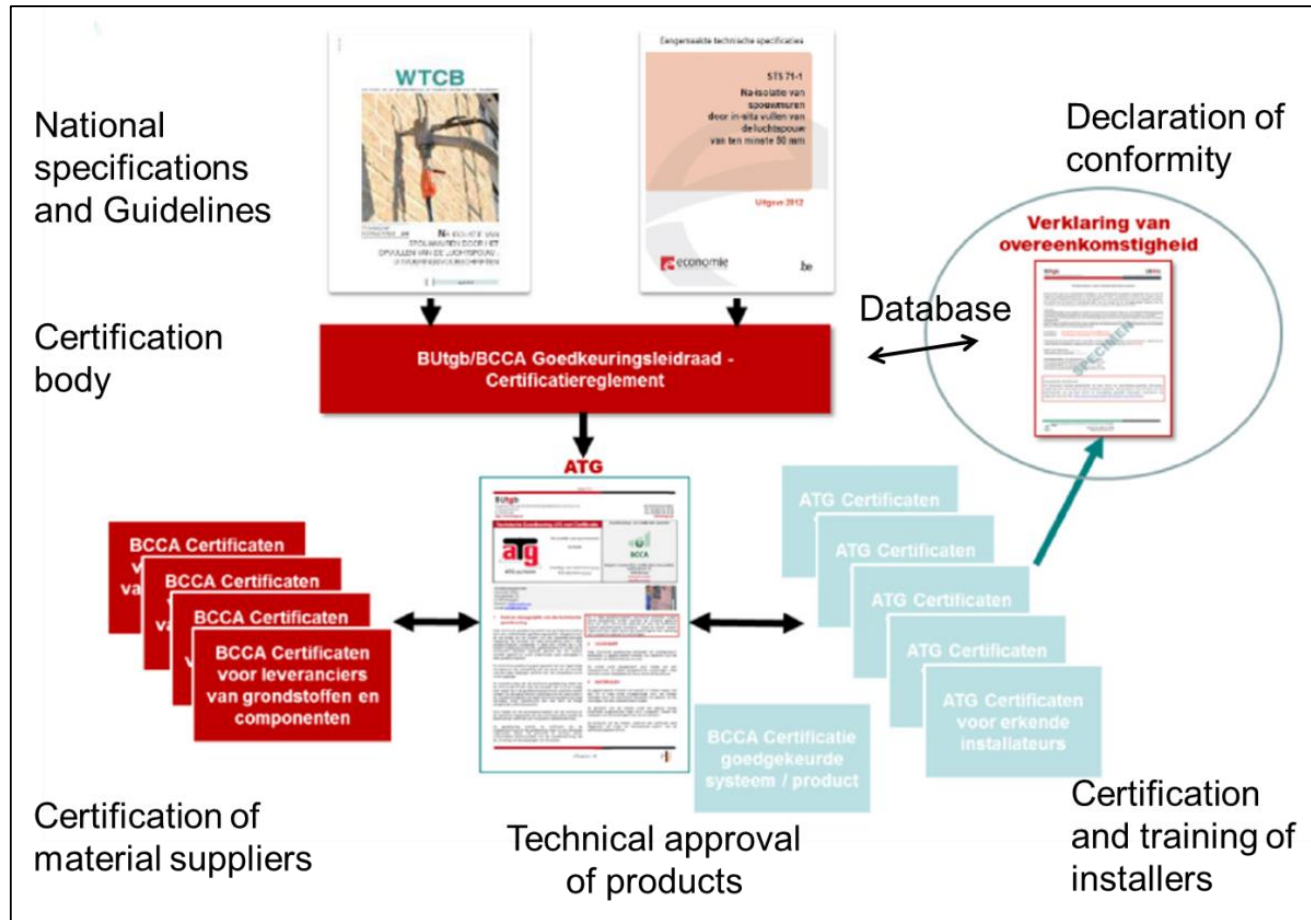


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Recorded cavity wall insulation installations in the UK



Quality Framework for Insulation of Cavity Walls in Belgium



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The German Contractor's Declaration



- New obligatory scheme
- Requires contractors to confirm in writing that the specific minimum energy performance requirements
 - for building envelope components,
 - space heating and hot water generation and distribution systems and
 - newly installed cooling and ventilation systemsare met during the realisation of a renovation measure.
- Infringements lead to fines

Template

Mr/Mrs. Company

.....
(Place, Date)

Contractor's Declaration according to § 26a of the German Energy Saving Ordinance (EnEV) 2009
Building/Invoice as of:
.....

Dear Madam, dear Sir,
Hereby we confirm that the modifications or installations of building components performed by us are in accordance with the requirements of the German Energy Saving Ordinance (EnEV) 2009:

external insulation layers installed
 external insulation layers renewed
 internal insulation layers installed
 internal insulation layers renewed

This contractor's declaration has to be kept available by you, the building owner, for at least 5 years and has to be provided to the responsible authority on request.

.....
Signature of the company

Building Services Systems Declaration based on built Characteristics: Salzburg



WP	Wärmepumpe	EPC and EPC input data	Automatic check: comparison	Declaration and actual product data
		Energieausweis	Vergleich	Deklaration
	Bivalenzpunkt	0 °C	–	keine Angabe
	Jahresarbeitszahl	4,99	=	4,99
	Nennwärmeleistung	7,19 kW	–	7,60 kW
	COP	6,0	–	3,8
	COP A2/35	keine Angabe	–	3,8
	Wärmepumpentyp	Wasser/Wasser	×	Luft/Wasser
	Betriebsart	Bivalent parallel	–	keine Angabe
	Anlagentyp	Heizwärmebedarf und Warmwasserwärmebedarf	–	keine Angabe
	Fussbodenheizung vorhanden	Ja	=	Ja
	Hersteller	nicht verfügbar	–	IDM
	Typ	nicht verfügbar	–	TERRA ML 6-8
	Volumen Estrich	nicht verfügbar	–	10 m ³

Documentation



- Quality of the work: “Towards improved quality of the work – Documented examples of existing situations regarding quality of the work”

28 documented examples of existing situations regarding Quality of the Works and 18 Best Practice Examples how to achieve better quality of the works

- Quality of the work: “Source book on Guidelines for better enforcement of quality of the works”

- Available at <http://qualicheck-platform.eu>

