HKI – quality label

(December 1st, 2015)

Certification program

for

Roomheaters according to EN 13240, inset appliances (fireplaces and inserts for Kachel- / Putzöfen) according to EN 13229 and slow heat release appliances according to EN 15250 burning solid fuels.

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1 Foreword

It is the political goal of the German federal government to significantly increase the market share of these renewable energy sources. Renewable domestic energy sources are an essential part of the CO2-emission decrease strategy and contribute to an independent, secure and sustainable energy supply.

With the support of environmental agencies, HKI seeks to restrict the operation of heating appliances with high emission rates and poor constructional quality. It is desirable to minimize user operating errors and to prevent a deterioration of emission performance which may be caused e. g. by deformation of the appliance. An intensification of valid emission limits (2. Step of 1. BImSchV) would result in inaccuracies due to current measuring methods which is not constructive. Such intensification of emission levels on type-testing would not result in a better emission situation of the appliances in real operation.

HKI succeeded in developing a quality certification program with requirements on the practical conditions that will help to improve the efficiency and emission-levels of appliances. The goal of the HKI quality label is to permanently decrease emission rates and to increase efficiency values of the appliances. The following specifications focus on the durability of the appliances and reduce real life emissions of appliances and to approximate the type test results.

It is regarded that an intensification of limit values for type tests are not helpful as the accuracy of measurement is limited by actual values and are not in relation to real life emissions mainly caused by the operator.

Long-term goal of the HKI quality label is to increase the market share of durable, high quality and low emission solid-fuel burning appliances according to 1. BImSchV.

Furthermore this quality label is intended to assist communities in meeting the European targets for particulate matter (PM10 and PM2,5) and can be used as a tool e. g. in the preparation of clean air acts.

Basis of this certification program are the valid harmonized standards as specified in clause 4 and the additional requirements as specified in clauses 5.2 and 5.3.

As part of the harmonization of the future standards series EN 16510 “Residential solid-fuel burning appliances” an expansion of the requirements of the HKI quality label is planned to further improve the emission rates of the appliances during operation. Extended type testing procedures shall lead to future test results that are closer to reality.

2 Requirements and certification costs

In order to obtain the HKI quality label, the appliances shall be tested either by a test lab / Notified Body (NB) or an accredited in-house inspection body[1]. Additional tests are required for this quality label.

The manufacturer implements an internal production control. This in-house control has to be documented and the verification documents have to be submitted to HKI annually. A random inspection of this production control will be conducted once a year by an external testing body (e. g. FNH-staff member, FNH-consultant, NB). Provided the production control is conducted by a certified quality management system according to EN ISO 9000 ff, the afore-mentioned external random inspection proves are unnecessary.

The HKI as an independent, neutral and competent institution examines and evaluates the product characteristics with regards to the requirements of the quality label based on the submitted documentation including possibly existing national building approvals.

The costs incurred for the HKI quality label certification as well as the costs for the recognition process of the in-house production control and the random inspection of the production control comply with the current HKI-schedule of fees for the HKI quality label as specified in annex E.

All relevant documentation must be submitted to HKI in German or English.

[1] Die Anerkennung kann durch einen Notified Body, DIN CERTCO oder den FNH durchgeführt werden

3 Scope

This certification program for the HKI quality label applies to roomheaters, inset appliances (fireplaces and inserts for Kachel- / Putzöfen) and slow heat release appliances burning solid fuels and contains in combination with the testing specifications of clause 4 all requirements for the labelling process.

4 Test specifications

Test basis for the testing and certification of the heating appliances are the requirements of the certification program and the following documents:

EN 13229	*Inset appliances including open fire appliances for solid fuels – general requirements and test methods*
EN 13240	*Roomheaters for solid fuels – general requirements and test methods*
EN 15250	*Slow heat release appliances for solid fuels — general requirements and test methods*
CEN/TS 15883 (DIN SPEC 1101)	*Residential solid-fuel burning appliances – emissions test procedure*

5 Product requirements

5.1 Normative requirements

Minimum requirements for material properties, safety, capacity, instructions (assembly and operating instructions) and the declaration of performance as well as labelling (minimum data on label) are specified in the relevant harmonized standards. Important requirements according to these standards are listed below.

<u>Performance requirements for materials, design and construction:</u>

- Requirements for documentation of production
- Construction requirements (general design, outlets, adjustment of combustion, flue gas ways, cleaning tools, fireroom doors, combustion air supply, integrated flue gas buffles, bottom grate, fire bars, ashpan, boiler, flue gas dampers, cleaning of heating surfaces).

<u>Safety requirements:</u>

- Temperature of adjacent combustible components
- Tools
- Safety testing at natural flue draught
- Safety testing to prevent flue gas leakage and the drop out of ember
- Temperature in fuel storage container / fuel hopper
- thermal discharge device
- Stability and tightness of boilers
- Size of the firedoor window of inserts for Kachel- / Putzöfen
- Temperature of convection air grilles
- Electrical safety

<u>Performance requirements:</u>

- Flue draught
- Temperature of flue gas
- CO-emissions
- Efficiency levels
- Combustion period at nominal heat output

- Nominal heat output
- Nominal water heat output
- Nominal space heat output
- Combustion period at slow combustion and recovery capability
- Re-ignition
- Operation by the user

5.2 Emission limits and efficiency requirements

Within the framework of the HKI quality label the limits specified in table 1 (2. Step of 1. BImSchV in force in Germany since 01.01.2015) apply in regards to emissions of particulate matter (PM) and carbon monoxide (CO).
In addition to relevant standards and recent emission control regulations (1. BImSchV) there are minimum requirements for limit values of organic hydrocarbons (OGC) and nitrogen oxide (NOx) which must be kept in order to obtain the HKI quality label. The emission values are based on 13 % O_2. The emission limit values must be met during the parallel measurement of the nominal heat output test (NWL-test).

Table 1 Limit values:

Appliance type	Test standard	Efficiency level [%]	CO [g/m³N][2]	PM [g/m³N][2]	OGC [gC/m³N][3]	NOx [g/m³N][3]
Roomheaters with shallow bed	DIN EN 13240: 2005-10 (Intermittent burning)	78[4]	1,25	0,04	0,12	0,2
Roomheaters with fuel chute	DIN EN 13240: 2005-10 (Continuous burning)	78[4]	1,25	0,04	0,12	0,2
Inset appliances (closed operation)	DIN EN 13229: 2005-10	78[4]	1,25	0,04	0,12	0,2
Fireplace insets for retro-fitting open fires[5]	DIN EN 13229: 2005-10	76[4]	1,25	0,04	0,12	0,2
Inset appliances with shallow bed	DIN EN 13229: 2005-10	80[2]	1,25	0,04	0,12	0,2
Inset appliances with fuel chute	DIN EN 13229: 2005-10	80[2]	1,25	0,04	0,12	0,2
Slow heat release appliances	DIN EN 15250: 2007-06	80[4]	1,25	0,04	0,12	0,2

5.3 Additional requirements for appliances within the framework of the HKI quality label

In addition to the requirements of the European harmonized standards (hEN) there are environmental and real life operation requirements. E. g. on durability and high-quality of the solid-fuel heating appliances as specified in table 2.

[2] 1.BImschV – Federal emission control act for small and medium sized combustion units, Issue date 22nd of March, 2010
[3] Lot 20 Ökodesign – Regulation (EU) 2015/1185 of Committee dated April 24th, 2015
[4] Increased compared to 1. BImSchV
[5] Emission values of fireplace boxes are significantly lower than emission values of open fireplaces. The limited heat exchange complicates the realization of a higher efficiency level significantly.

Table 2 Requirements in addition to type testing according to harmonized standards

Requirement for	Requirement profile in addition to type testing according to hEN
Durability	Before type testing (NHO testing including emission determination) by a NB: – Verifiable pre-testing of the test appliance for a minimum of 8 hours under NHO conditions or for a minimum of 4.5 hours under safety test conditions by a NB or the manufacturer. – Proof that all metallic components in contact with fire/flue gas have a minimum wall thickness of 2 mm (e. g. combustion chamber, flue gas ways, fireroom door). Exempted are parts that have to be built on a smaller scale due to their function[6].
Installation and Operating instructions	The following information is mandatory for the manufacturer's operating instructions: - The recommendation to install a draught regulator - If the efficiency is > 80% and the flue gas temperature is < 170°C (in measuring section), the user must be advised of possible condensation inside the chimney and that a renovation of the chimney might be necessary. Note: Higher flue gas temperatures may necessitate additional information. It is imperative to stress the importance of a safe evacuation of flue gas depending on existing chimney situation in the instruction manuals. - Indicate the necessity of opening the firebox doors slowly for refueling to prevent a possible leaking of flue gas, give an advice to open a window during this refueling period. - Include a brief illustrated instruction sheet explaining the correct way to light the fireplace. - Link and/or QR-code as a shortcut to the corresponding brochures (www.richtigheizenmitholz.de and possibly http://hki-online.de/de/heiz-und-kochgeraete/heizen-mit-bb) or include a CD with relevant videos and documentation.
Production quality	- A determination of the reference leakage rate of a reference appliance from the production direct at application for HKI quality label is required, provided that this data has not already been determined at type testing. - The leakage rate shall not exceed 2 m³/h + 2 m³/(h kW) at 10 Pa over- or under-pressure - The internal production control shall test the 1st appliance in production of each year and also each 100th appliance out of an appliance family (as specified in the relevant standards). The inspection of on site assembled appliances that are delivered in compounds may take place on site. - The difference in the leakage rate between the reference appliance and the leakage rate of actual produced appliance shall not exceed the following tolerance range: - +2m3/h or +10% - -4m3/h or - 20% See calculation according to annex F NOTE: RLUA with cross national building approval meets these requirements.

[6] Beispiele solcher Bauteile sind Scheibenhalter, etc.

6 Testing

6.1 General

In order to evaluate and verify the necessary testing, an official test report documenting the type testing according to the latest harmonized standards with emission level limits in accordance with the measuring requirements in part 4 is essential. The notified body will write a test report with the defined requirements for the quality label which will be used as a reference for testing. For existing fireplace models the subsequent filing of a test report with the specified requirements is permissible. Furthermore it is necessary for evaluation to include the documentation according to table 1 and 2.

6.2 Sampling

The test specimen has to be representative of the entire fireplace production line. The normative production control ensures that the produced appliances comply with the type tested appliances. The manufacturer assumes liability for this with the signed declaration of performance according to CPR.
The RLA specimen for reference testing in regards to leakage rate is chosen randomly and represents the entire production line, which is acknowledged in a written statement by the manufacturer.

6.3 Test report

The testing laboratory (notified body) composes a test report for the client, disclosing the type testing results. The complete test report has to be submitted to HKI in German and English.

Testing for the HKI quality label has to be done by notified bodies for the standards for solid-fuel heating appliances as specified in part 4. Supplementary test reports of a certified in-house production control are accepted.

Evidence of compliance with 5.2 has to be clearly indicated in the type test report.

The test report must comply with the requirements specified in the relevant hEN and has to include the following information:

a) Name and address of manufacturer
b) Name and address of applicant (if other than manufacturer)
c) Name, serial number and description of fireplace
d) Test specifications (standards and certification program) including date of issue
e) Type of testing (e. g. type test, supplementary test and so on).
f) Information whether the tested appliance is a prototype or a serial product
g) Results and evaluation of the test in regards to the requirements as specified by the certification program (including measured leakage rate).
h) Analysis and characteristics of the test fuel used during testing.
i) Name and address of the testing body
j) Reference number of test report
k) Date of test
l) Date of issue of test report
m) Name and signature of the person responsible for testing

7 Monitoring

7.1 Self-monitoring of manufacturer

With help of quality assurance measures the manufacturer has to ensure that the certified product characteristics are maintained. These measures can consist of a specialized in-house production control (WPK) and a quality management system (QM-system) according to the standards series DIN EN ISO 9000 ff.

7.2 In-house production control (WPK)

The in-house production control consists of a continuous monitoring of the production process in compliance with the requirements defined by the manufacturer.

The WPK includes periodic examinations and tests as specified by the standards in part 4 and/or evaluation and use of test results for control purposes of the used material and components, technical appliances, production process and the product itself.

8 Certification

The products subject to certification are tested for compliance with the requirements specified by the quality label. The manufacturer receives a certificate or the right to use the quality label.

8.1 Application for Certification

Applicant may be the manufacturer according to § 4 product liability law (ProdHaftG) or distributor with a written agreement of sale in accordance with product liability laws.

The following documentation has to be submitted to HKI by the applicant:

- Application for certification with annex A
- EN-type test report of the appliance
- Additional test reports according to requirements specified in parts 5.2 and 5.3, if not already included in the type testing report.
- Evaluation of measuring results of the leakage rate measurement as specified in annex B, if not already included in the type testing report.
- Declaration of performance of appliance
- Operating and installation instructions

After receipt of application the applicant will receive an order confirmation as well as information on the application process and the completeness of the submitted documents.

8.2 Certificate and right of use

After successful review of the submitted documents the manufacturer receives a certificate and the right to use the HKI quality label.

8.3 Assessor – requirements and regulations

HKI ensures that the appointed assessors are up to date with current basic rules and procedures for testing.
For this purpose the assessors receive periodic information and schooling on the correct evaluation in compliance with the European harmonized standards of CEN/TC 295 as well as (measuring) requirements for emission measurements necessary for evaluation.

HKI will inform the appointed assessor of changes in relevant procedures and test basis as well as effective dates at an early stage.

8.4 Confidentiality

HKI and FNH undertake to handle all information pertaining to the evaluation with maximum care.

Any information on the testing procedures that is disclosed to a third party is subject to explicit authorization of the contracting party.

The assessor commits to maintain confidentiality and not to disclose, make available or circulate any relevant information collected during the certification process under any circumstances to a third party.

8.5 Effectivity

The effectivity relates to the applicability of the European harmonized standards. Additional restrictions relating to the effectivity of the verification procedure are not stipulated.

8.6 Defects

HKI can revoke the right of use if any product defects relating to the compliance with the relevant requirements for the quality label are detected. The manufacturer will be notified in written form of the necessity to remedy the discovered defects in order to regain the right of use. Without the remedy of these defects the HKI quality label will not be restored.

8.7 Termination

The right of use of the HKI quality label expires without further notice from HKI in case of defects that are discovered during the test for conformity to the standards or during emission measurements.
The right of use also expires because of unpaid fees.

8.8 Abuse of the right of use

The right of use shall not be abused by the manufacturer, e. g. if the right of use has been given for only a part of the manufacturer's production range but is used by the manufacturer on all products HKI retains the right to revoke the right of use for all products of this manufacturer.

9 Entry into the HKI-Cert-data base

After the right of use for an appliance has been granted, the data will be entered into the HKI-Cert-data base.

This entry will be deleted at termination of the right of use.

Annex A – Application form for the right of use of the HKI-quality label

Technical data

Candidate: _____

_____

_____

Number of standard: _____

Type designation: _____

Vending name: _____

Test laboratory: _____

Test report-number, Date: _____

Technical data / characteristics

characteristics		**Page of test report**
Geometrical dimension [mm] - height x width x depth		
Nominal heat output (scope) [kW]		
Space heat output (scope) [kW]		
Water heat output (scope) [kW]		
Water operation pressure [bar]		
Distance to combustible walls – wing/ back/ top/ front [each with mm]		
Multiple occupancy (yes/no)		
fuel - wood / wood briquettes brown coal briquettes other	☐ ☐	
Temporary burning- (Z) / slow combustion stoves (D)		
Flue gas temperature on connector [°C]		
Flue gas mass flow [g/s]		

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Efficiency and emissions (emissions based to 13% O_2):

For the combustibles	CO in g/Nm³	NO_x in g/Nm³	C_nH_m in g/Nm³	dust in g/Nm³	η in %
☐ wood					
☐ brown coal briquettes					
☐					

Proof of the thermic prior charge of the heating appliance before the NWL-test
- verified through test report (page of the test report) ☐
- verified through declaration by the manufacturer ☐

Proof of the requirement of durability
- verified through test report (page of the test report) ☐
- verified through declaration by the manufacturer ☐

Proof of the requirement of the manual
- verified through declaration by the manufacturer and sample (included in the annex) ☐

Place and date stamp and signature of the manufacturer

We confirm mandatorily with our signature that we still produce our appliances like the tested types named above.
We confirm furthermore that we accept the basic principles of the certification, especially in point 8.8.

Annex B – Form for the evaluation of the leakage rate of the reference appliance

company: _____

Number of standard: _____

Type designation: _____

Serial number: _____

Test laboratory / QM-manager: _____

Head of test laboratory / head of QM: _____

(test)report-number, date: _____ ,

Date, Signature head of test laboratory / head of QM: _____ ,

Description for blinding the appliance

(total- / primary)air connector	☐ / ☐
Secondary air connector / -slash / -entry (description)	☐ / ☐ /
Tertiary air connector / -slash / -entry (description)	☐ / ☐ /
other 1	
other 2	
Annex– picture of binding	☐

characteristics		**Page of the (test)report**
Leakage of the reference appliance from manufacturing [m³/h]		

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Annex C – submission for the annual documentation of the production control

company:
Number of standard:
Type designation:
Test laboratory / QM-manager:
Head of test laboratory / head of QM:
QM-protcol-number., date: ,

Date, Signature head of test laboratory / head of QM: ,

The following characteristics of the manufacturing supervision have to be included in the QM-protocol:

characteristics		**page of the QM-protocol**
Exterior measurement of the tester (H/B/T) [mm]		
measurements of the interior combustion chamber (H/B/T) [mm]		
Merchandise income control sheet steel / ladle		
Leakage of the reference appliance from manufacturing [m³/h]		
Leakage of appliances of the manufacturing [m³/h]		

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Annex D – Application form for recognition of an in-house inspection body by HKI

Applicant: _____

_____

_____

_____

Date of application: _____

Date of assessment of the test laboratory: _____

assessor: _____

The test components for evaluating the testing laboratory of HKI are the basic principle for the assessment. For the evaluation, all documents of the testing laboratories must be available in German or English.

Annex E – schedule of fees for the HKI quality label

General

The following fees for the performance of the HKI-quality label apply concerning the reimbursement of costs to HKI. The performances will be charged in form of tariff units in which the actual price per unit amounts to 40, 00 € plus VAT.

All fees will become due directly with accounting.

Certification costs

The certification costs for the HKI quality label are already included for HKI members. That means that HKI members have no additional costs for the HKI quality label.

Of course, the HKI quality label is available for extern companies as well. The certification costs within the certificate for those candidates are calculated as followed:

Conformity evaluation – Initial certification (validness 5 years)

(Test report of an NB, specifications according as in annex A and annex B)
- per product and type 6 GE
- per subtype / model type 2 GE

Prolongation of the Certificate (for further 5 years)
(Specifications according as in annex C)
- per product and type 2 GE
- per subtype / model type

The application for prolongation can be done informally (without annex A).

Recognition of shop test laboratories and random sample checks in production

For the recognition of shop test laboratories and random sample checks in production, the daily rate is about 200,-€ plus travel expenses for the FNH-manager/FNH-consultant.

Flat administration fee

There will be a flat administration fee for changes in the recognition certificate (changed name or address etc.) - per activity 1 GE

Other

If not mentioned differently, other performances will be charged in accordance to the effort.

Annex F – calculation of the tolerance range for deviations in leakage rate of reference appliances and manufacturer appliances

Provisions of the requirement for the leakage rate during the production surveillance

The maximum admitted reference value VR,max arise from the nominal heat output $PNWL$ in kW.

$VR,max = 2m^3/h + PNWL \cdot 2m^3/kW{\cdot}h$

The reference value is determined during the reference measurement and is not allowed to top VR,max.

The minimum level $V-$ in between the tolerance range arises from:

$V- = Min\ 0{,}8 \cdot VR\ ,\ VR - 4m^3/h$

And the maximum level $V+$ arises from:

$V+ = Max\ 1{,}1 \cdot VR\ ,\ VR + 2m^3/h$

Hence, you receive the feasible range for the measuring value during the production surveillance:

$V- \leq VM \leq V+$

Graphic example