



**Solid recovered fuels
characterised by top quality**

RAI QUALITY MARK 724



INHALT

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Dear Readers,

As a substitute for fossil fuels, secondary fuels made from waste are an important component for climate-friendly energy production and protection of our environment and resources. However, clearly defined quality is a prerequisite for efficient, sustainable and eco-friendly co-incineration at cement works, lime works and large power stations.

The Gütegemeinschaft Sekundärbrennstoffe und Recyclingholz e. V. (Quality Assurance Association for Solid Recovered Fuels and Recycled Wood) has succeeded in establishing high standards with the implementation of the RAL Quality Mark 724 for solid recovered fuels. This is making a crucial contribution to the establishment of solid recovered fuels as a component in a modern energy and recycling economy. Qualified processing and monitoring of production provides recycling companies with the security of constantly high quality and correspondingly environmentally compatible and harmless utilisation. As a result, manufacturers, users and the environment benefit in equal measure from solid recovered fuels of approved quality.

This is also indicated by the clear rise in the number of secondary fuels quality-approved in accordance with RAL 724: A volume of 500,000 tonnes was achieved in 2015 alone, and the trend is still growing; a development which provides us with both confirmation and the incentive to continue to work actively to promote the production and use of high-grade solid recovered fuels.

**The executive board of the Gütegemeinschaft
Sekundärbrennstoffe und Recyclingholz e. V.**

**The BGS e. V. is made up
of the following bodies:**

- General assembly
- Executive board
- Quality board

Core tasks of the quality committee:

- Professional support of quality and test specifications
- Decisions to award and withdraw Quality Marks
- Ongoing discussions involving relevant issues



The Quality Assurance
Association is founded in
Münster

1999

RAL recognition of
the "Solid Recovered
Fuels" Quality Mark

2001

The awarding of
the first "Solid Recovered
Fuels" Quality Mark

2002

Achieving targets with joint forces

The Gütegemeinschaft Sekundärbrennstoffe e. V., or BGS e. V. for short, was founded in 1999. The objective of its work is to promote the production and use of quality-assured solid recovered fuels in order to conserve natural resources and reduce CO₂ emissions. Together, producers and users of solid recovered fuels, as well as other companies and institutions pursuing a diverse range of activities, are working to achieve this goal.

The awarding of the Quality Mark and the professional support of the recognition and later monitoring procedure at the heart of the work we do. We also organise annual conferences on relevant topics relating to the processing and use of solid recovered fuels. We maintain constant contact with the association committees in order to exchange information and

experiences, as well as taking part in national and international conferences and trade fairs. Our tasks also include supporting and implementing relevant projects and research projects, as well as supporting legislative procedure and participating in national and European committees.

The road that takes us all further

- Targeted fuel production and a closed quality assurance system
- Identification of high-grade solid recovered fuels by awarding the Quality Mark
- Qualification by laboratories by means of annual implementation of round robin tests
- Europe-wide standardisation of solid recovered fuels

RAL recognition of the "Biogenic Fraction" Quality Mark

2006

Conversion of the guide values to the calorific value reference

2012

15th anniversary of the Association

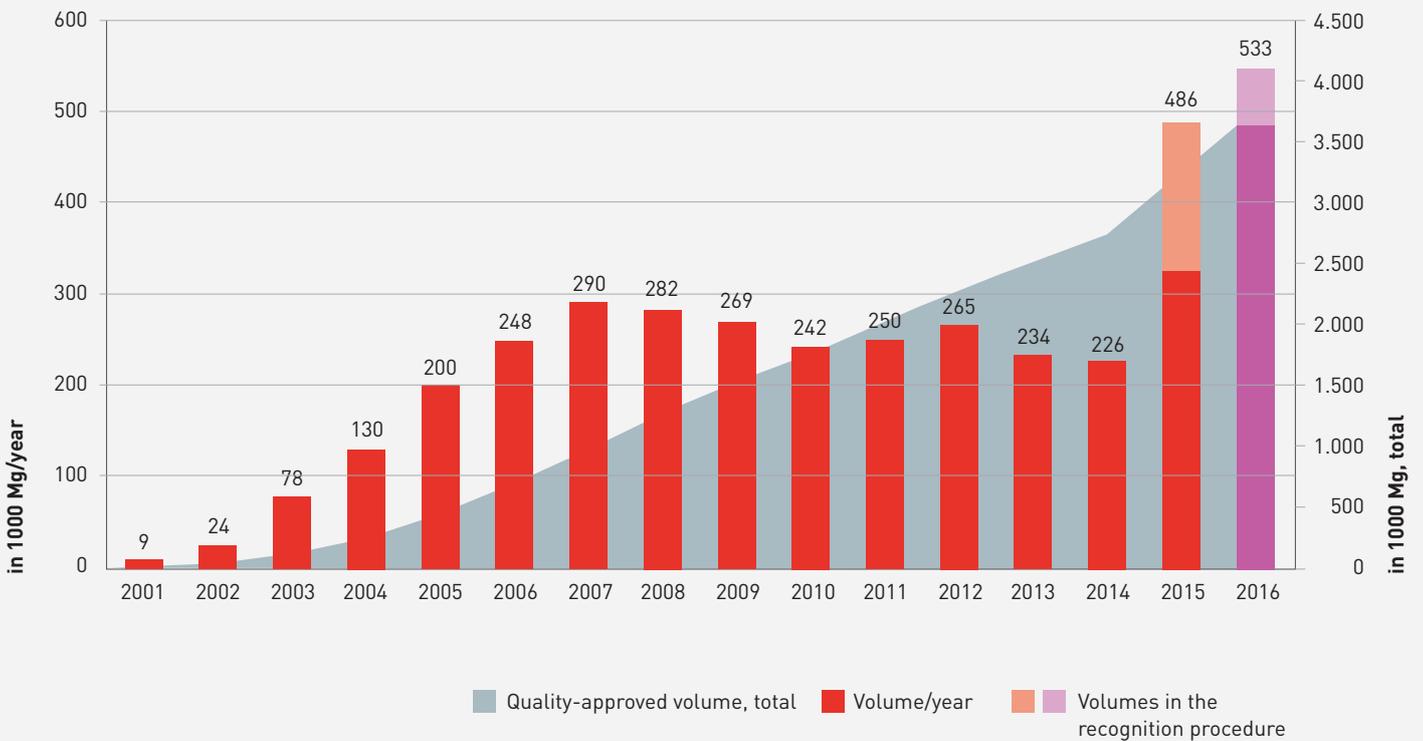
2014

500,000 Mg/a solid recovered fuels quality-approved according to RAL-GZ 724, trend continuing to grow

2015



Development of quality-approved solid recovered fuel volumes for the years 2001 to 2015 (forecast 2016)



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The Quality Mark: official seal of approval for quality

Quality Marks serve to identify products and services that are manufactured or offered in accordance with stringent quality criteria and hence are far above the minimum standards. Corresponding requirements are defined and tested by RAL within the scope of development of a Quality Mark. After that, the underlying RAL Quality Assurance Association – RAL being the Deutschen Institut für Gütesicherung und Kennzeichnung e. V. (the German institute of quality assurance and labelling) – is given the right to award the Quality Mark.

When developing the RAL Quality Mark 724, the emphasis was on high quality standards, precise sampling and analysis regulations and an integrated, practical quality assurance system involving both internal and third-party monitoring.

This gave rise to the quality and test specifications which determine the procedure and criteria for the receipt and withdrawal of the Quality Mark. Solid recovered fuels with a defined quality in accordance with RAL-GZ 724 are protected with the brand name SBS®.

In addition to RAL-GZ 724, BGS e. V. also awards the RAL Quality Mark 727 for “determination of the biogenic fraction in substitute fuels without RAL quality assurance and other substitute fuels”. These analysis certificates can also be used by recycling firms for verification management in emissions trading.



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Quality assurance pays for itself

For producers of solid recovered fuels, quality assurance offers particular opportunities to use recognition in accordance with RAL-GZ 724 to achieve proof of consistent, defined quality and corresponding process control. This results in better marketability compared with competing products that have not been quality-approved.

Producers of quality-approved secondary fuels are shown to be particularly quality aware partners of recycling firms and are thus able to obtain a competitive edge.



Sekundärkunststoffe



Sekundärbrennstoff SBS®

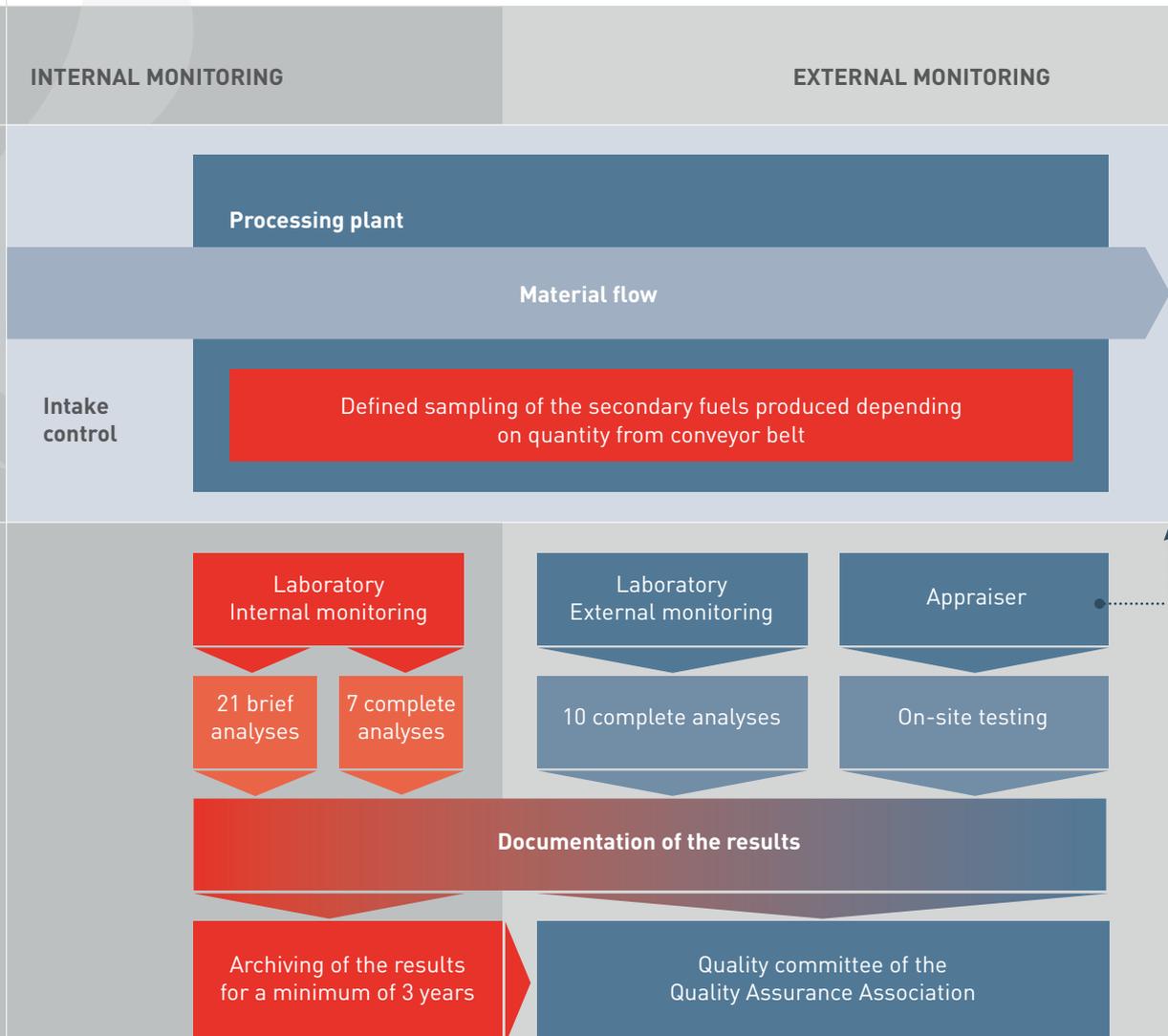


Quality assurance creates work. And makes sense.

The road to RAL Quality Mark 724 does require a certain amount of expense, but it is affordable and can also result in valuable optimisations for producers' products and processes.

Quality assurance demands and processes are clearly regulated and transparent. Precisely specified sampling and analysis operations in terms of type and number come between the receiving inspection and the test report. This allows both internal and third-party monitoring to be carried out using established quality criteria, thereby guaranteeing an independent and reliable end result. On this basis, the Quality Mark will be awarded by us and regularly checked upon fulfilment of all relevant criteria and observance of the guide values.

THE MONITORING PROCEDURE AT A GLANCE





Everything under control in the closed system

All the quality assurance requirements are based on one another, so we can refer to this as a closed system. Within this, quality assurance takes place as a combination of internal monitoring by the SBS producers and third-party monitoring by a consultant and test laboratory.

.....▶ **Input control/verification:**

Initial assurance of the defined quality: is the waste type compliant with the quality and test specifications?

.....▶ **Sampling:**

Continuous monitoring of production according to a set schedule, with manual or automatic sampling

.....▶ **Sample preparation and analysis:**

Clear requirements regulate the extraction, preparation and analysis of the samples

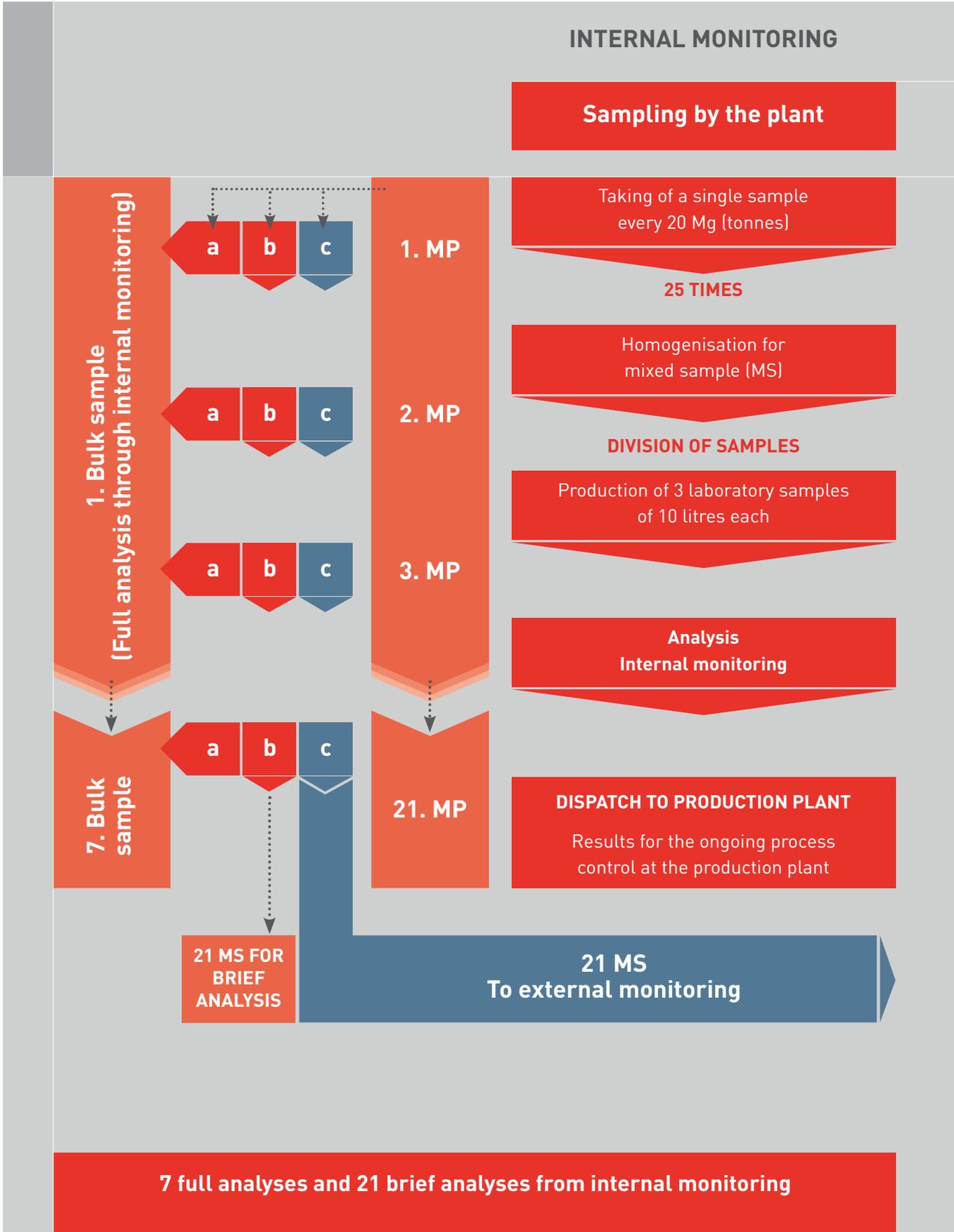
.....▶ **Quality criteria:**

Compliance with the ambitious heavy metal guide values and the procedural and fuel-related parameters (calorific value, water content, ashes, chlorine, copper)

.....▶ **Data evaluation:**

Implementation by the Quality Assurance Association: statistical evaluation and test report

A monitoring interval in detail



a Retention sample
IM laboratory full analysis

b Sample,
IM laboratory
Brief analysis

c Sample,
test laboratory
from IM

Single Sample:
5 litres each

EXTERNAL MONITORING

Sampling by tester

3 deadlines each with 6 partial samples (PS) in 3 h

7 full analyses from 21 MS

PS 1 PS 2 PS 3 PS 4 PS 5 PS 6

1/2h

1/2h

1/2h

1/2h

1/2h

Homogenisation for mixed sample with 60 litres

DIVISION OF SAMPLES

Production of a laboratory sample 10 litres

Analysis of 7 complete analyses

Analysis of 3 complete analyses

10 full analyses

(7 complete analyses from 21 mixed samples from internal monitoring plus 3 complete analyses from third-party monitoring)

Dispatch of the results to BGS

Evaluation of 10 analysis results based on calorific value
Median and 80th percentile

Dispatch to production plant

Test report

10 complete analyses from external monitoring (3 through sampling on site and 7 out of 21 mixed samples from internal monitoring)



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Reference values guarantee harmless use

The established reference values for quality assured secondary fuels ensure harmless use when clearly not achieving the emission protection limits, as has been documented multiple times in extensive material flow analyses.

PARAMETER	HEAVY METAL REFERENCE VALUES	
	Median [mg/MJ]	"80th percentile" value [mg/MJ]
Arsenic	0,31	0,81
Cadmium	0,25	0,56
Cobalt	0,38	0,75
Chromium	7,8	16
Mercury	0,038	0,075
Manganese	16	31
Nickel	5,0	10
Lead	12	25
Antimony	3,1	7,5
Tin	1,9	4,4
Thallium	0,063	0,13
Vanadium	0,63	1,6



The parameters calorific value, water content, ashes and chlorine must also be analysed and documented during quality assurance. The contracting parties establish these procedure-specific parameters bilaterally. The copper parameter must also be analysed and documented.



Vom Abfall ...



... zum **Brennstoff**

ELM Recycling GmbH & Co. KG

Fabrikstraße 29 • D-73266 Bissingen / Teck

Telefon 0 70 23 / 9 00 81-20

Telefax 0 70 23 / 9 00 81-29

info@elm-recycling.de • www.elm-recycling.de

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We are there for you

BGS e. V. offers valuable support services to everyone wishing to pursue the road to quality assurance. We provide knowledgeable advice on all issues relating to the quality assurance process and offer specific assistance during preparation and implementation. Our contacts with experienced partners can be used if necessary. We also supply sample contracts, collections of documents and forms which facilitate the implementation process.



Wissen, was drin ist.



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- Analytik im Rahmen des Entsorgungs- und Flächenmanagements
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GBA Gesellschaft für Bioanalytik mbH

Standort Gelsenkirchen	gelsenkirchen@gba-group.de
Standort Pinneberg	pinneberg@gba-group.de
Standort Hildesheim	hildesheim@gba-group.de
Standort Freiberg	freiberg@gba-group.de



Dr.- Ing. Thomas Glorius,
Chairman of the BGS
quality board

“Reliable fuel qualities as a result of modern technology and functioning quality assurance are a prerequisite for further development of the solid recovered fuel market. Thus the national (DIN) and international (CEN, ISO) standardisation work supported by BGS provides new opportunities for global resource and climate protection. This results in greater transparency and improved acceptance among relevant authorities and the interested public.”

Voices and experience



Prof. Dr.-Ing. Sabine Flamme,
General Manager of Gütegemein-
schaft Sekundärbrennstoffe und
Recyclingholz e. V.

“I feel confident that as a quality assurance association, we have established efficient, eco-friendly use of solid recovered fuels as part of a modern energy and waste management thanks to our quality assurance.”



Georg Kleikemper,
Head of material flow management,
ECOWEST

“We introduced quality assurance to our processing plant in 2008. Our experiences show that as a result of the regulated quality assurance system, we are reliably producing a high-quality solid recovered fuel with consistent quality. Our customers perceive the Quality Mark as an indicator of transparency and quality.”



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Harmless usage means security

The RAL 724 Quality Mark for solid recovered fuels, which has been established for more than 15 years, creates compatibility and transparency and places the cooperation between producers and customers on a foundation of trust.

Recycling companies benefit from constantly high product quality in the recovery process. Quality-assured solid recovered fuels guarantee efficient and harmless co-incineration due to the proven calorific value and established heavy metal reference values. The analysis certificates for the producer's biogenic fractions may also be used by recycling firms for verification management in emissions trading.

With the help of quality assurance, waste can be used increasingly as a valuable, low-emission energy source, saving on resources and helping to meet climate targets. In the last decade alone, the use of quality-assured solid recovered fuels allowed savings of 2 million Mg of CO₂ and approx. 1.4 million Mg of HCU (hard coal units) to be achieved at fossil primary energy sources. In addition, ferrous and non-ferrous metals are made available through production. Co-incineration at cement works also allows the mineral fraction to be recovered substantially.



Dr.-Ing. Martin Oerter
Forschungsinstitut der
Zementindustrie GmbH

“Qualified production and monitoring guarantee well-defined solid recovered fuel properties. This creates a crucial prerequisite for environmentally compatible and harmless utilisation of these substances in industrial production processes.”



Recognising perspectives, exploiting opportunities

A quality assurance obligation is a prerequisite for the further development of the solid recovered fuel market in Germany and Europe. High availability and binding regulations for quality pave the way for trade facilitation and recognition of solid recovered fuels as standard fuel. Hence the eco-friendly, resource-saving use of secondary fuels can be extended still further and open up new perspectives for business and the environment in equal measure ...



... Exploiting these opportunities in a targeted fashion is our job, and we are working consistently on this. You can also make an active contribution by being a member of BGS e. V.



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die stoffliche Verwertung, z. B. von Metallen, Altkunststoffen und Holz durch die Schonung von Ressourcen und der Einsparung von Energie einen wertvollen Beitrag zum Klimaschutz.

Dass wir Mitglied beim BGS sind und das geregelte System der Gütesicherung für unsere Ersatzbrennstoffe verwenden, versteht sich dabei ganz von selbst.

**Provide information.
Take part. Make progress.**

■ **Your quality assurance partner:**

Dipl.-Biol. Sigrid Hams
Telephone: +49 251 8365-290
Email: hams@bgs-ev.de

■ **Your organisation partner:**

Sabine Holtfester
Telephone: +49 251 8365-264
Email: holtfester@bgs-ev.de

■ **Gütegemeinschaft Sekundärbrennstoffe
und Recyclingholz e.V.**

Fachbereich 6
Corrensstraße 25
48149 Münster
Telephone: +49 251 8365-260
Email: bgs@bgs-ev.de



www.bgs-ev.de