



## IGR-Journal Actual 13

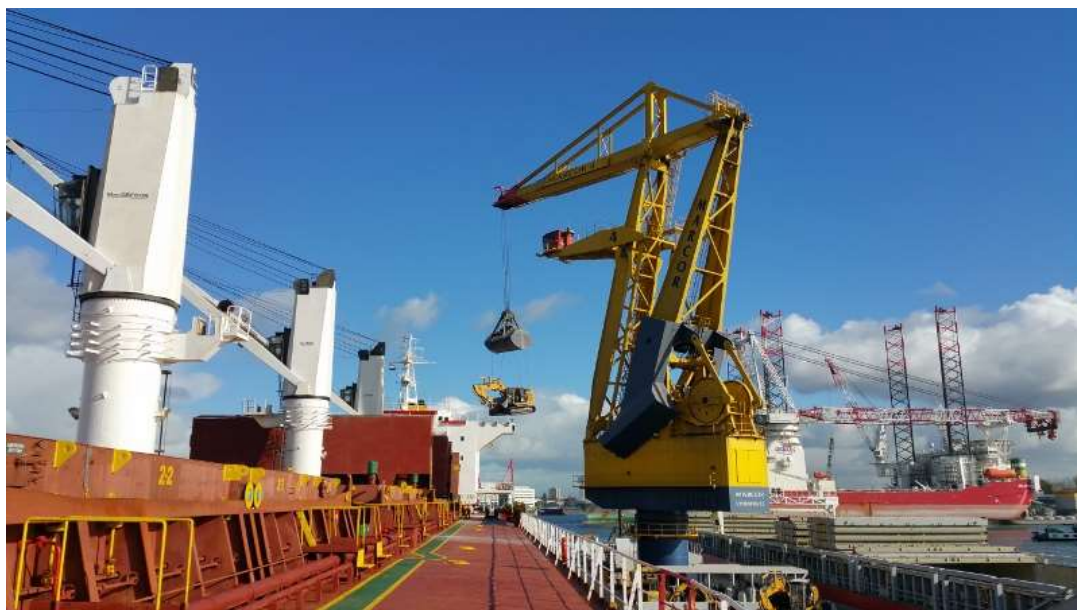
Die Akkreditierung gilt für den in der Urkundenanlage  
D-PL-20043-01 festgelegten Umfang

### News:

- IGR in the field – sampling on a cargo ship
- Lot-sampling of recycled glass
- new: Cr6+-analysis
- new: separate determination of total sulfur and sulfur isotopes in glass
- IGR participating at nationwide German research project of the BMUB regarding "Sustainable Construction"
- Spectacular archaeological site: oldest European glassworks near by the IGR
- Charitable donation for „Elternhilfe für das krebserkrankte Kind Göttingen e. V.“
- Week end trip to the North Sea

### IGR in the field - sampling on a bulk carrier

We offer on-side services to our customers for a long time. Late last year we conducted a special kind of sampling. In Rotterdam some of our team took technical correct samples periodically during the unloading of 50000t de-icing salt. These samples were analysed subsequently according to the "Technische Lieferbedingungen für Streustoffe des Straßenwinterdienstes, TL-Streu".



Unloading of the de-icing salt

#### Anschrift

IGR GmbH  
Rudolf-Wissell-Str. 28a  
37079 Göttingen  
Germany

#### Telekontakte

Telefon: +49 551 2052804  
Telefax: +49 551 2052803  
Internet: [www.IGRgmbh.de](http://www.IGRgmbh.de)  
E-mail: [d.diederich@IGRgmbh.de](mailto:d.diederich@IGRgmbh.de)

#### Geschäftsführer

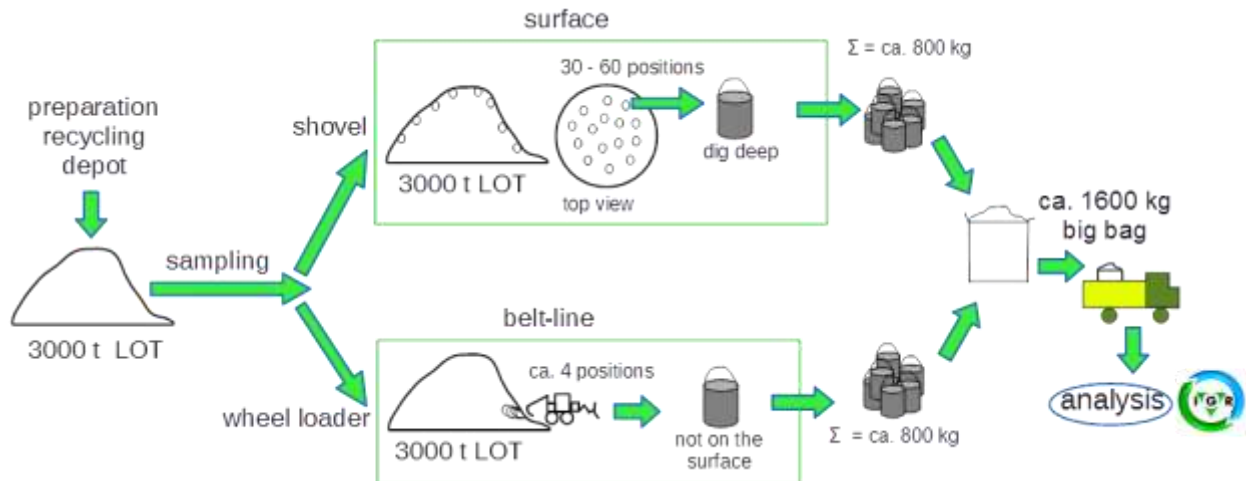
Dirk Diederich  
Amtsgericht Göttingen, HRB 200825  
USt-IdNr.: DE263177717  
Steuer-Nr.: 20/200/40624

#### Bank

Braunschweigische Landessparkasse  
BIC (Swift-Code): NOLADE2HXXX  
IBAN: DE67 2505 0000 0199 9915 48

## Lot-sampling of recycled glass

For an extensive quality assurance, the IGR offers a competent sampling which is also suitable for big piles as well as a sophisticated method to enrich, identify and measure quantitatively foreign matters.

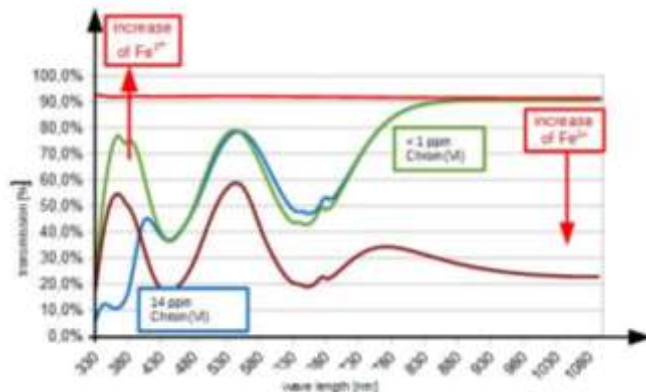


Since the beginning of the year the IGR offers additionally another analysis for recycled glass, based on the quick test which is carried out in the Netherlands for years. This test meets the increasing requirements of the bottlers concerning the external supervision of the recycled cullet in the melting process.

## New: Cr<sup>6+</sup> analysis

For the removal of melting problems in recent years we did a lot of Fe<sup>2+</sup>-analyses for our customer's world-wide. Concomitant with these analyses raised the demand in quantitative analyses of Cr<sup>6+</sup>-concentrations in strongly oxidising molten glass.

The team of the IGR developed a new wet-chemical method, referring to current standards. Cr<sup>6+</sup>-concentrations from 0,5 ppm can be detected quantitatively in glasses or raw material.



- solar flat glass
- hollow glassware green with: 0,4 % Fe<sup>2+</sup>
- hollow glassware green with: 4 % Fe<sup>2+</sup>
- hollow glassware green with: 80 % Fe<sup>2+</sup>

## Neu: Separate determination of total sulfur and sulfur isotopes (SO<sub>4</sub><sup>2-</sup>/S<sup>6+</sup>) in glass

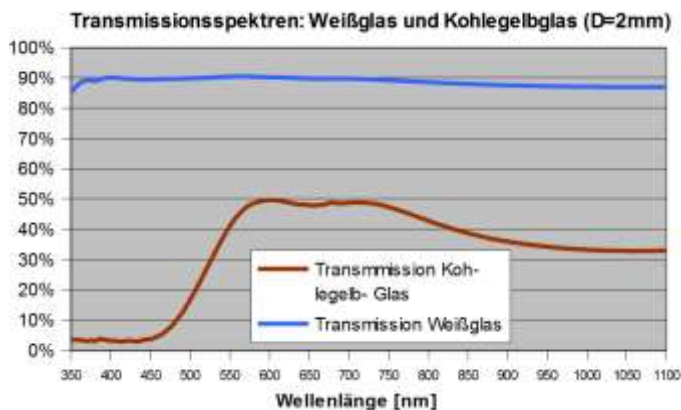
The different valences of sulfur (S<sup>6+</sup>, S<sup>4+</sup>, S<sup>2-</sup>) are important during the purification process of various sorts of glass (e.g. float glass, container glass). Trivalent iron (Fe<sup>3+</sup>) leads in the presence of sulfide to a most intensive brown color. The concentration of these ions decides the intensity of the brown coloring, called "kohlegelb", of the glass.

Normally a determination of the main and auxiliary elements (SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, CaO, MgO, Na<sub>2</sub>O, K<sub>2</sub>O, ...) as well as total iron (specified as ,Fe<sub>2</sub>O<sub>3</sub>' ) and the total concentration of the residual sulfur. Additionally, the redox value is ascertained., which gives the ratio of the divalent iron (Fe<sup>2+</sup>) and total iron and incidental the trivalent iron (Fe<sup>3+</sup>) of the material.

There was no routine analysis to detect the ratio between total sulfur and the different valences in the glass product. It is known from literature that at room temperature it is only sulfide (S<sup>2-</sup>) and/or sulfate (SO<sub>4</sub><sup>2-</sup> or S<sup>6+</sup>) in the glass, but at temperatures less than 400° C, sulfide (SO<sub>3</sub><sup>2-</sup> or S<sup>4+</sup>) exist only as trace elements.

The IGR in cooperation with Dr. Drexler Glasservice GmbH developed a method, which analyses additionally to the concentration of total sulfur the concentration of the hexavalent sulfur in the material separately.

So, the IGR is able to offer with his newly developed analysis an improved possibility to assess brown glass or other sulfide containing special glass.



	Weißglas	Braunglas
S <sup>6+</sup> als ,SO <sub>3</sub> '	0,172 %	0,004 %
S <sup>2-</sup> als ,SO <sub>3</sub> '	0,000 %	0,051 %
S <sub>ges.</sub> als ,SO <sub>3</sub> '	0,172 %	0,055 %

## IGR participating at nationwide German research project of the BMUB regarding "Sustainable Construction "

The IGR participates in the working group "Modul D" of the "Round Table Sustainable Building" of the BMUB (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety).

This working group discuss and develop solutions to improve the handling of 'End-of-life'-processes concerning the demolition and recycling of buildings. Mr. Diederich is able to contribute his profound experiences concerning the recycling sector and extend his expertise in respect of innovations of building material recycling.

## **Spectacular archaeological site: Oldest European glassworks near by the IGR**

In Bodenfelde, 35 km east of Göttingen, three ovens of a medieval forest glassworks were rediscovered and archaeological excavated. The found pieces dated from the 9th century. According to present knowledge it was about the oldest historically confirmed European forest glassworks.

So, our institute is located in one of the historically oldest glassmaker regions in Europe.

## **Charitable donation for „Elternhilfe für das krebskranke Kind Göttingen e. V.“**

The corporate culture of the IGR includes a social contribution also.

Therefore we made a donation to the local aid organization „Elternhilfe für das Krebskranke Kind Göttingen e. V.“ at the end of the year 2016.

## **Week end trip to the North Sea**

A successful company needs motivated employees. A good working atmosphere and a well-coordinated Team are the conditions for an effective community.

To strengthen the cooperation, intensify the personal contacts and to thank the team for a successful business year we passed a week-end at the North Sea together.

