

# FLUXANA

## Final Proficiency Test Report (2. Correction) FLX-CRM 130, FLX-CRM 131



Bedburg-Hau, 27.06.2016

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**Statistics and Report**  
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| FLX-CRM 130                    | Mean %  | U (95%) | s <sub>R</sub> | s <sub>r</sub> | Mean - 2*s <sub>R</sub> | Mean + 2*s <sub>R</sub> |
|--------------------------------|---------|---------|----------------|----------------|-------------------------|-------------------------|
| Al <sub>2</sub> O <sub>3</sub> | 11,708  | 0,194   | 0,375          | 0,021          | 10,958                  | 12,458                  |
| CaO                            | 56,750  | 0,469   | 0,910          | 0,073          | 54,93                   | 58,57                   |
| Cr <sub>2</sub> O <sub>3</sub> | 0,020 * | 0,004   | 0,005          | 0,001          | 0,01                    | 0,03                    |
| Fe <sub>2</sub> O <sub>3</sub> | 2,888   | 0,085   | 0,164          | 0,017          | 2,56                    | 3,216                   |
| K <sub>2</sub> O               | 0,701   | 0,014   | 0,026          | 0,009          | 0,019                   | 0,753                   |
| MgO                            | 1,853   | 0,055   | 0,106          | 0,017          | 1,641                   | 2,065                   |
| Mn <sub>2</sub> O <sub>3</sub> | 0,065   | 0,006   | 0,011          | 0,001          | 0,043                   | 0,087                   |
| Na <sub>2</sub> O              | 0,285   | 0,041   | 0,071          | 0,017          | 0,143                   | 0,427                   |
| P <sub>2</sub> O <sub>5</sub>  | 0,072 * | 0,014   | 0,021          | 0,001          | 0,03                    | 0,114                   |
| SiO <sub>2</sub>               | 14,386  | 0,251   | 0,486          | 0,036          | 13,414                  | 15,358                  |
| SO <sub>3</sub> total          | 11,032  | 0,308   | 0,577          | 0,042          | 9,878                   | 12,186                  |
| SrO                            | 0,052 * | 0,004   | 0,005          | 0,002          | 0,042                   | 0,062                   |
| TiO <sub>2</sub>               | 0,565   | 0,01    | 0,019          | 0,005          | 0,527                   | 0,603                   |
| ZnO                            | 0,018 * | 0,004   | 0,004          | 0,000          | 0,01                    | 0,026                   |
| LOI                            | 5,223   | 0,157   | 0,306          | 0,046          | 4,611                   | 5,835                   |

| FLX-CRM 131                    | Mean %  | U (95%) | s <sub>R</sub> | s <sub>r</sub> | Mean - 2*s <sub>R</sub> | Mean + 2*s <sub>R</sub> |
|--------------------------------|---------|---------|----------------|----------------|-------------------------|-------------------------|
| Al <sub>2</sub> O <sub>3</sub> | 23,156  | 0,472   | 0,916          | 0,092          | 21,324                  | 24,988                  |
| CaO                            | 43,071  | 0,694   | 1,344          | 0,054          | 40,383                  | 45,759                  |
| Cr <sub>2</sub> O <sub>3</sub> | 0,037   | 0,009   | 0,014          | 0,002          | 0,009                   | 0,065                   |
| Fe <sub>2</sub> O <sub>3</sub> | 3,311   | 0,136   | 0,263          | 0,008          | 2,785                   | 3,837                   |
| K <sub>2</sub> O               | 0,311   | 0,013   | 0,025          | 0,009          | 0,261                   | 0,361                   |
| MgO                            | 1,684   | 0,050   | 0,097          | 0,014          | 1,49                    | 1,878                   |
| Mn <sub>2</sub> O <sub>3</sub> | 0,035   | 0,008   | 0,014          | 0,001          | 0,007                   | 0,063                   |
| Na <sub>2</sub> O              | 0,467   | 0,047   | 0,081          | 0,010          | 0,305                   | 0,629                   |
| P <sub>2</sub> O <sub>5</sub>  | 0,064 * | 0,009   | 0,013          | 0,001          | 0,038                   | 0,090                   |
| SiO <sub>2</sub>               | 8,659   | 0,310   | 0,601          | 0,043          | 7,457                   | 9,861                   |
| SO <sub>3</sub> total          | 18,457  | 0,473   | 0,889          | 0,115          | 16,679                  | 20,235                  |
| SrO                            | 0,072 * | 0,012   | 0,015          | 0,002          | 0,042                   | 0,102                   |
| TiO <sub>2</sub>               | 1,184   | 0,036   | 0,064          | 0,005          | 1,056                   | 1,312                   |
| ZnO                            | 0,007 * | 0,003   | 0,003          | 0,000          | 0,001                   | 0,013                   |
| LOI                            | 2,098   | 0,099   | 0,198          | 0,016          | 1,702                   | 2,494                   |

\* less than 10 laboratories

***This report is the second correction of the final report from 03.05.2016.***

***1. correction: FLX-CRM 131: Import error at Mean - 2\*s<sub>R</sub> and Mean + 2\*s<sub>R</sub>,***

***2. correction: FLX-CRM 131: A Z-score were recalculated (SrO: see Lab code 21a).***

***There is no change on other statistical data.***

**All values are in mass % and are based on dried sample material (1h at 105°C).**

|                           |  |
|---------------------------|--|
| <b>Mean</b>               | <b>calculated</b>  |
| <b>U (95%)</b>            | <b>uncertainty calculated for a confidence interval of 95% (k=2)</b>                     |
| <b>S<sub>R</sub></b>      | <b>Reproducibility standard deviation</b>  |
| <b>S<sub>r</sub></b>      | <b>Repeatability standard deviation</b>  |
| <b>Range of tolerance</b> | <b>Mean ± 2* S<sub>R</sub>; all labs within this range show satisfactory performance</b> |

### **Interpretation of the results**

The proficiency test shows good agreement between the participating laboratories. The determined repeatability standard deviation corresponds well to the industrial need. The reproducibility standard deviation shows that the laboratories use slightly different calibration standards. This can be seen especially for CaO, Al<sub>2</sub>O<sub>3</sub> and SO<sub>3</sub> which show untypical concentrations for a cement.

### **Introduction**

X-ray fluorescence analysis is a widely used technique for the analysis of oxidic materials.

However, for the calibration of XRF instruments dedicated standard material is needed. As a worldwide supplier for XRF laboratories, FLUXANA has developed a number of services to support XRF users. One of these services is the production of new reference materials and the organization of proficiency tests (PT).

In 2011, FLUXANA introduced its own quality management.

In February 2014, FLUXANA received accreditation from German DAKKS according to DIN EN ISO/IEC 17025 for the test laboratory in Bedburg-Hau.

The production of reference materials and the performance of proficiency tests is not yet accredited. However, FLUXANA has applied for the accreditation process at DAKKS.

Nevertheless, all evaluations are performed in agreement with DIN EN ISO/IEC 17043:2010-05, ISO Guide 34:2009, ISO Guide 31:2000 and ISO Guide 35:2006.

### **Proficiency test provider / Ordering address for the samples**

FLUXANA GmbH & CO.KG  
Borschelstraße 3  
47551 Bedburg-Hau, Germany  
[info@fluxana.de](mailto:info@fluxana.de)

Coordinator: Charlotte Winkels-Herding, QM

Responsible for evaluation and data processing: Dr. Rainer Schramm, CEO

Responsible for in-house analytical tests: Dr. Barbara Schäfer, Head of test laboratory

## Proficiency test items

This reference material sample was produced from commercial product. Material was taken directly from the production stream.

Performing of analysis by Participants of PT.

About 30 kg of each material were delivered to and homogeneously distributed into 50 ml bottles by FLUXANA. The bottles were then vacuum packed for storage.

| Test item   | Description  |
|-------------|--|
| FLX-CRM 130 | cement (high Al <sub>2</sub> O <sub>3</sub> , low SiO <sub>2</sub> ) |
| FLX-CRM 131 | cement (high Al <sub>2</sub> O <sub>3</sub> , low SiO <sub>2</sub> ) |

## Homogeneity and stability

The material was used as delivered. Based on ISO Guide 35:2006 and DIN ISO 13528:2009-01, a homogeneity and stability study of the materials was performed.

## Metrological traceability

The analytical methods used by the participants must be in accordance with international measurement standards (XRF fusion, ICP or any other wet chemical methods), which are considered as traceable. Other methods, like XRF pressed pellet or XRF standardless methods, are not recognized as being traceable. Values from these methods will not be taken into account for calculation of the assigned values and the target standard deviation. However, all values will be shown in the report and the laboratory evaluation report.

## Participant accreditation

It is important to know whether or not the participant laboratory works under ISO 17025 accreditation. Therefore, we will ask this information for each parameter. Which values were determined under accreditation will be shown anonymously in the final report.

## Number of participants

The minimum number of participants is 10.

## Potential major sources of errors

- The sample must be ignited before the analysis (see sample preparation)

## Recommendation for XRF with fusion

Approximately 1.5-2 g of sample is calcined at 950°C until constant mass (typically 1 hour) in a platinum or Al<sub>2</sub>O<sub>3</sub> crucible in a muffle furnace. After cooling and determination of the loss on ignition, 1 g of the calcined sample is mixed with 8 g flux in a platinum/gold (95:5%) crucible and melted in an automatic fusion machine or melted manually in a muffle furnace.

If the electrical fusion machine from FLUXANA is used program A0 is recommended. If the gas fusion machine VULCAN from FLUXANA is used program P0 is recommended.

## Evaluation

According to DIN EN ISO/IEC 17043:2010-05, we will use robust statistical methods according DIN ISO 13528:2009-01, ISO/TS 20612:2007 and DIN 38402-45:2014-06.

## Advantages of using robust statistics

Statistical methods are robust in the sense that any outliers have only a limited effect on the overall result. Steps were taken to ensure that the results are still meaningful, even if the proportion of outliers is 1/3. Robust statistics are also preferable for small populations.

## Outliers

Outliers in the statistical sense are typically not detected when using robust statistical methods, because the robust A+S algorithms were found to work better than the classical approach (which is outlier detection plus arithmetic mean and classical s.d. formula). Outliers shown in the evaluation are only based on z-scores and marked in yellow and red.

## Number of measurements

All participants are requested to perform two measurements. This is necessary to perform the repeatability standard deviation for the laboratories. Participants who send only one or more than two values must ask first for permission otherwise they will be excluded.

## Publication of the results

All participants will be informed about the results of the PT with a report. Which results were delivered by which laboratory will be kept confidential. All laboratories are encoded where the code is only known by the organizer and the individual laboratory. The final report will be published on the FLUXANA website. First a preliminary report will be sent out for verification by the participants. Within one month, the final report will be published.

## Laboratory performance

Each participant will receive a performance evaluation report based on z-scores. The diagram shows the relative difference to the assigned values.

## Further information

With this PT, a software approach will be used. All participants will receive a special software tool to enter their data. Paper sheets or excel tables will only be accepted in special cases in prior agreement with the organizer. In this way, we want to improve the data quality and avoid any transmission errors.

## Participants

|  |              |
|--|--------------|
| Air Liquide                                    | France       |
| Dorfner Anzaplan                               | Germany      |
| FLUXANA GmbH & Co.KG                           | Germany      |
| Fraunhofer IVV                                 | Germany      |
| HuK Umweltlabor GmbH                           | Germany      |
| Technische Hochschule Nürnberg Georg Simon Ohm | Germany      |
| VDZ GmbH                                       | Germany      |
| CMS Clinker Sdn Bhd                            | Malaysia     |
| PPC Cement Group Lab Services                  | South Africa |
| IK4-AZTERLAN                                   | Spain        |
| Askale Cement (Gumushane)                      | Turkey       |
| Bursa Cement                                   | Turkey       |
| Cimentas Cement                                | Turkey       |
| Cimsa Afyon                                    | Turkey       |
| Erdemir  | Turkey       |
| Sisecam  | Turkey       |
| Votorantim Cement - Ankara Plant               | Turkey       |
| Votorantim Cement - Corum Plant                | Turkey       |
| Votorantim Cement - Sivas Plant                | Turkey       |
| Votorantim Cement - Yozgat Plant               | Turkey       |

## Statistical Evaluation

### Calculation of Mean $m$

The mean  $m$  for all laboratories was calculated using the Hampel estimator (ISO/TS 20612:2007 9.2.3) based on the laboratory means  $\mu$ .

### Calculation of reproducibility standard deviation $s_R$

The reproducibility standard deviation  $s_R$  was calculated using the Q-method (ISO/TS 20612:2007 9.2.3).

### Calculation of repeatability standard deviation $s_r$

The repeatability standard deviation  $s_r$  was also calculated using the Q-method.

### Uncertainty of Mean $U$

The uncertainty of mean  $U$  for  $k=2$  (95% confidence level) was calculated from the reproducibility standard deviation  $s_R$  and the laboratories  $p$  with valid data according DIN ISO 13528:2009-01 and Nordtest TR 537 ed. 3.1:

$$(1) \quad U = 2 * 1.25 * \frac{s_R}{\sqrt{p}}$$

### Laboratory performance

Laboratory proficiency assessment was based on z-scores. From all laboratory means  $\mu$  the **z-score**  $z$  was calculated:

$$(2) \quad z = \frac{m - \mu}{s_R}$$

|       |   |
|-------|---|
| $m$   | Mean value of all laboratories (assigned value) |
| $\mu$ | Mean value of individual laboratory             |
| $s_R$ | Reproducibility standard deviation              |

### Assessment on z-scores:

|                   |   |
|-------------------|---|
| $ z  \leq 2.0$    | indicates, satisfactory' performance = generates no signal          |
| $2.0 <  z  < 3.0$ | indicates, questionable' performance = generates a warning signal   |
| $ z  \geq 3.0$    | indicates, unsatisfactory' performance = generates an action signal |

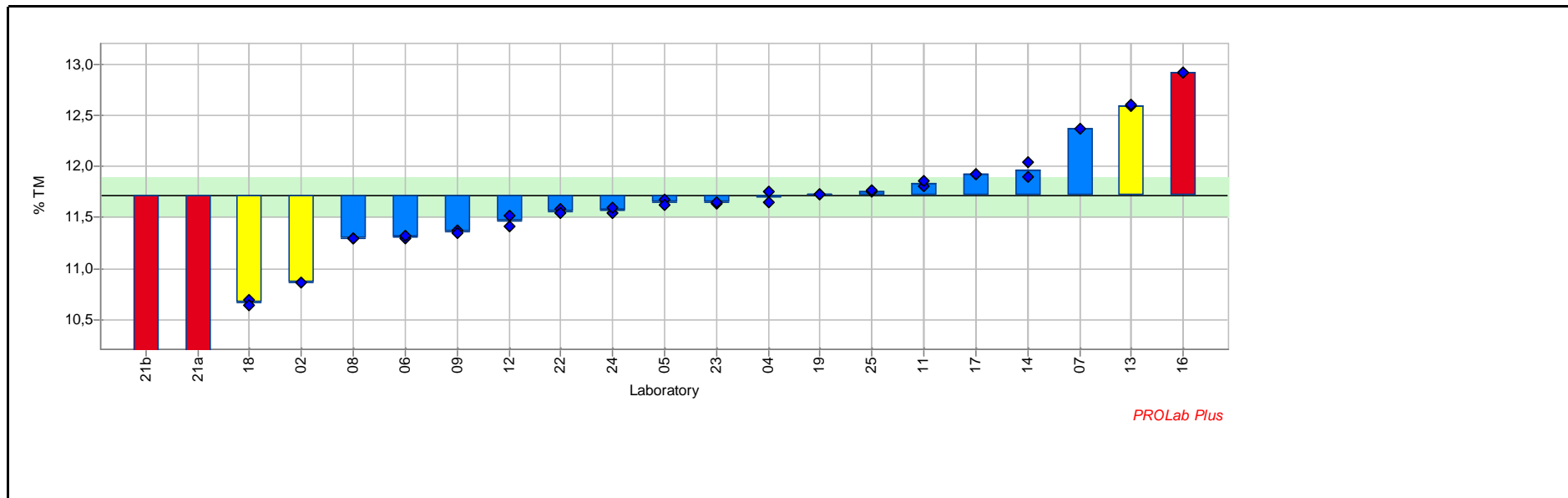
All laboratory means  $\mu$  with  $|z| \geq 2$  were marked with an 'E'. z-scores with  $3 \geq |z| \geq 2$  were highlighted with a yellow color, z-scores with  $|z| \geq 3$  were highlighted with a red color.

RV130 (Cement)

## Summary results



|                             |                                      |                            |   |
|-----------------------------|--------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                   | <b>Reprod. s.d.</b>        | <b>0,375 % TM</b>                                   |
| <b>Measurand:</b>           | <b>AL2O3</b>                         | <b>Repeat. s.d</b>         | <b>0,021 % TM</b>                                   |
| <b>Mean ± U(Mean):</b>      | <b>11,708 ± 0,194 % TM</b>           | <b>Statistical method</b>  | <b>Q/Hampel</b>                                     |
| <b>No. of laboratories:</b> | <b>15</b>                            | <b>Range of tolerance:</b> | <b>10,958 - 12,458 % TM ( z-score  &lt;= 2,000)</b> |
| <b>Assigned value</b>       | <b>11,708 % TM (Empirical value)</b> | <b>Target s.d.</b>         | <b>0,375 % TM (Empirical value)</b>                 |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 10,860   |       | -2,262  | 10,860  |         | no accreditation | XRF (fusion)      |         |
| 04       | 11,700   | 0,070 | -0,024  | 11,650  | 11,749  | no accreditation | XRF (fusion)      |         |

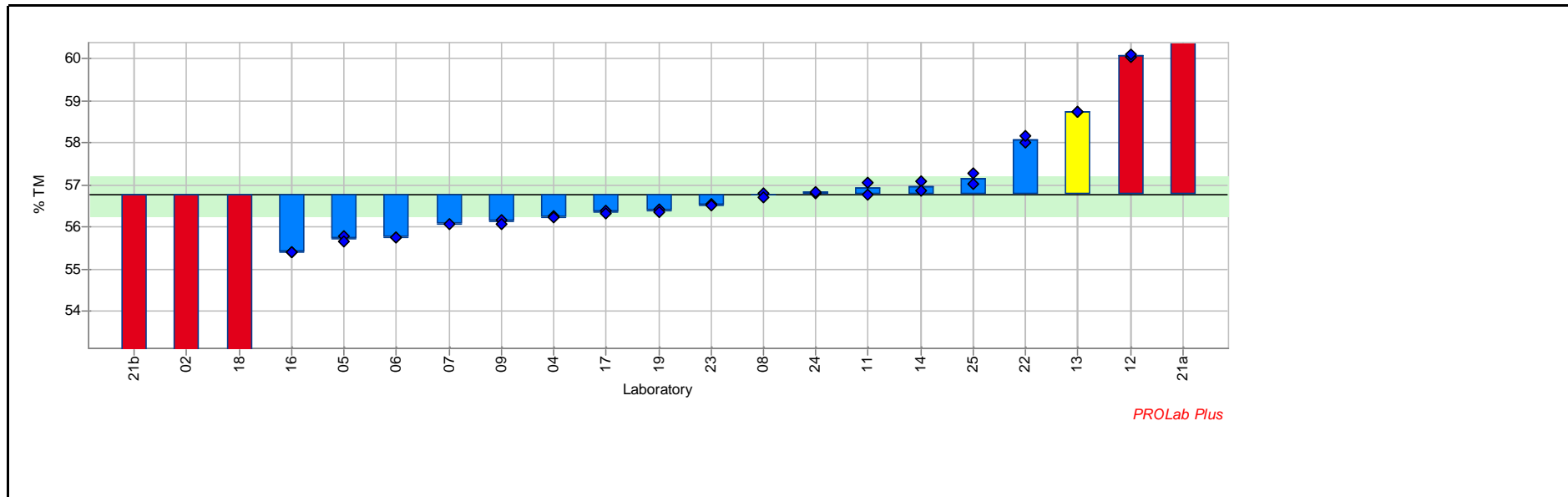


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 05       | 11,645   | 0,035 | -0,169  | 11,670  | 11,620  | no accreditation | XRF (fusion)           |         |
| 06       | 11,310   | 0,014 | -1,062  | 11,300  | 11,320  | no accreditation | XRF (fusion)           |         |
| 07       | 12,370   |       | 1,764   | 12,370  |         | no accreditation | XRF (fusion)           |         |
| 08       | 11,299   | 0,000 | -1,092  | 11,299  | 11,299  | ISO 17025        | XRF (fusion)           |         |
| 09       | 11,360   | 0,014 | -0,929  | 11,370  | 11,350  | ISO 17025        | XRF (fusion)           |         |
| 11       | 11,835   | 0,042 | 0,339   | 11,806  | 11,865  | no accreditation | XRF (fusion)           |         |
| 12       | 11,470   | 0,071 | -0,636  | 11,420  | 11,520  | no accreditation | XRF (fusion)           |         |
| 13       | 12,598   | 0,016 | 2,372   | 12,587  | 12,609  | no accreditation | XRF (fusion)           |         |
| 14       | 11,970   | 0,099 | 0,697   | 12,040  | 11,900  | no accreditation | XRF (fusion)           |         |
| 16       | 12,920   | 0,000 | 3,231   | 12,920  | 12,920  | no accreditation | Standardless info only |         |
| 17       | 11,925   | 0,007 | 0,577   | 11,930  | 11,920  | no accreditation | XRF (fusion)           |         |
| 18       | 10,665   | 0,035 | -2,782  | 10,690  | 10,640  | ISO 17025        | XRF (fusion)           |         |
| 19       | 11,730   | 0,001 | 0,058   | 11,731  | 11,729  | ISO 17025        | XRF (fusion)           |         |
| 21a      | 9,997    | 0,061 | -4,563  | 9,954   | 10,040  | ISO 17025        | Standardless info only |         |
| 21b      | 8,375    | 0,021 | -8,888  | 8,360   | 8,390   | ISO 17025        | Standardless info only |         |
| 22       | 11,560   | 0,025 | -0,396  | 11,578  | 11,542  | ISO 17025        | XRF (fusion)           |         |
| 23       | 11,646   | 0,011 | -0,168  | 11,638  | 11,653  | ISO 17025        | XRF (fusion)           |         |
| 24       | 11,575   | 0,035 | -0,356  | 11,550  | 11,600  | ISO 17025        | XRF (fusion)           |         |
| 25       | 11,759   | 0,013 | 0,136   | 11,750  | 11,769  | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 130      **Reprod. s.d.:** 0,910 % TM  
**Measurand:** CAO      **Repeat. s.d.:** 0,073 % TM  
**Mean ± U(Mean):** 56,750 ± 0,469 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 15      **Range of tolerance:** 54,930 - 58,570 % TM (|z-score| <= 2,000)  
**Assigned value:** 56,750 % TM (Empirical value)      **Target s.d.:** 0,910 % TM (Empirical value)



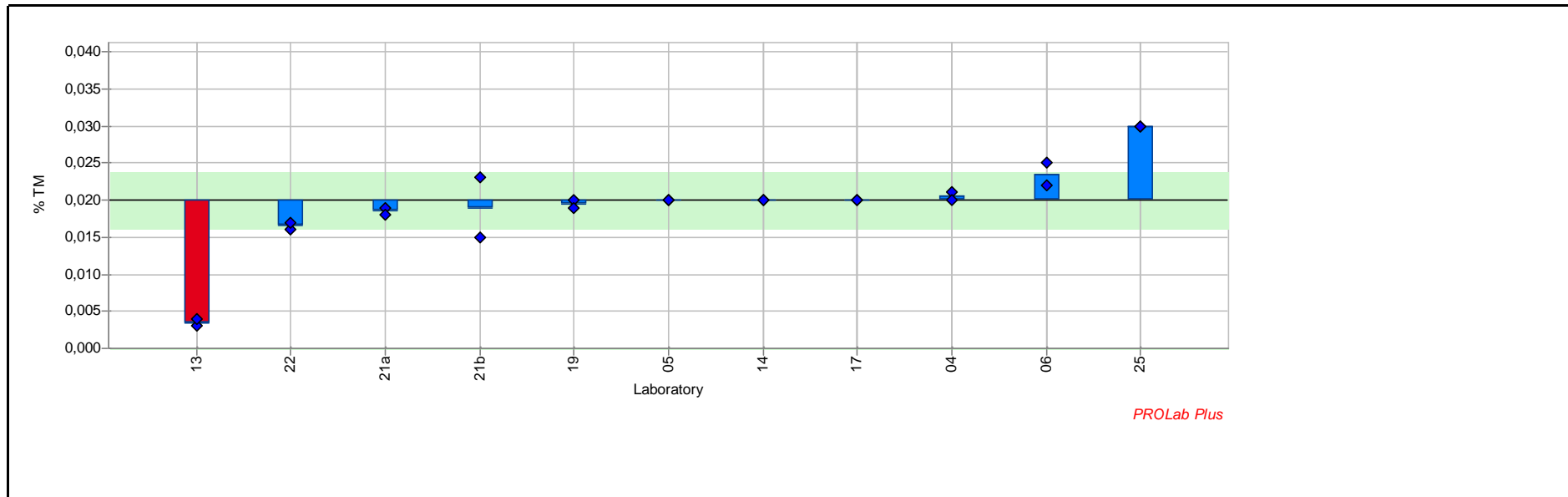
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 52,370   |       | -4,814  | 52,370  |         | no accreditation | XRF (fusion)      |         |
| 04       | 56,239   | 0,032 | -0,562  | 56,261  | 56,216  | no accreditation | XRF (fusion)      |         |
| 05       | 55,725   | 0,092 | -1,127  | 55,790  | 55,660  | no accreditation | XRF (fusion)      |         |
| 06       | 55,750   | 0,014 | -1,099  | 55,740  | 55,760  | no accreditation | XRF (fusion)      |         |
| 07       | 56,070   |       | -0,748  | 56,070  |         | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 56,758   | 0,075 | 0,009   | 56,811  | 56,705  | ISO 17025        | XRF (fusion)           |         |
| 09       | 56,115   | 0,049 | -0,698  | 56,150  | 56,080  | ISO 17025        | XRF (fusion)           |         |
| 11       | 56,921   | 0,207 | 0,187   | 56,774  | 57,067  | no accreditation | XRF (fusion)           |         |
| 12       | 60,065   | 0,049 | 3,643   | 60,030  | 60,100  | no accreditation | XRF (fusion)           |         |
| 13       | 58,734   | 0,012 | 2,181   | 58,743  | 58,726  | no accreditation | XRF (fusion)           |         |
| 14       | 56,970   | 0,170 | 0,242   | 57,090  | 56,850  | no accreditation | XRF (fusion)           |         |
| 16       | 55,405   | 0,007 | -1,478  | 55,400  | 55,410  | no accreditation | Standardless info only |         |
| 17       | 56,340   | 0,042 | -0,451  | 56,370  | 56,310  | no accreditation | XRF (fusion)           |         |
| 18       | 52,910   | 0,127 | -4,221  | 53,000  | 52,820  | ISO 17025        | XRF (fusion)           |         |
| 19       | 56,392   | 0,048 | -0,394  | 56,426  | 56,358  | ISO 17025        | XRF (fusion)           |         |
| 21a      | 63,810   | 0,339 | 7,759   | 63,570  | 64,050  | ISO 17025        | Standardless info only |         |
| 21b      | 51,995   | 0,247 | -5,226  | 52,170  | 51,820  | ISO 17025        | Standardless info only |         |
| 22       | 58,079   | 0,107 | 1,461   | 58,004  | 58,155  | ISO 17025        | XRF (fusion)           |         |
| 23       | 56,517   | 0,022 | -0,256  | 56,533  | 56,502  | ISO 17025        | XRF (fusion)           |         |
| 24       | 56,820   | 0,014 | 0,077   | 56,810  | 56,830  | ISO 17025        | XRF (fusion)           |         |
| 25       | 57,150   | 0,184 | 0,439   | 57,280  | 57,020  | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 130      **Reprod. s.d.:** 0,005 % TM  
**Measurand:** CR203      **Repeat. s.d:** 0,001 % TM  
**Mean ± U(Mean):** 0,020 ± 0,004 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 8      **Range of tolerance:** 0,009 - 0,031 % TM (|z-score| <= 2,000)  
**Assigned value:** 0,020 % TM (Empirical value)      **Target s.d.:** 0,005 % TM (Empirical value)



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 04       | 0,021    | 0,001 | 0,092   | 0,021   | 0,020   | no accreditation | XRF (fusion)      |         |
| 05       | 0,020    | 0,000 | -0,002  | 0,020   | 0,020   | no accreditation | XRF (fusion)      |         |
| 06       | 0,024    | 0,002 | 0,656   | 0,022   | 0,025   | no accreditation | XRF (fusion)      |         |
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | XRF (fusion)      |         |
| 13       | 0,004    | 0,001 | -3,108  | 0,003   | 0,004   | no accreditation | XRF (fusion)      |         |

*RV130 (Cement)*

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| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 14       | 0,020    | 0,000 | -0,002  | 0,020   | 0,020   | no accreditation | XRF (fusion)           |         |
| 17       | 0,020    | 0,000 | -0,002  | 0,020   | 0,020   | no accreditation | XRF (fusion)           |         |
| 19       | 0,020    | 0,001 | -0,096  | 0,020   | 0,019   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,018    | 0,001 | -0,285  | 0,019   | 0,018   | ISO 17025        | Standardless info only |         |
| 21b      | 0,019    | 0,006 | -0,191  | 0,015   | 0,023   | ISO 17025        | Standardless info only |         |
| 22       | 0,017    | 0,001 | -0,661  | 0,016   | 0,017   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,030    | 0,000 | 1,880   | 0,030   | 0,030   | no accreditation | XRF (fusion)           |         |

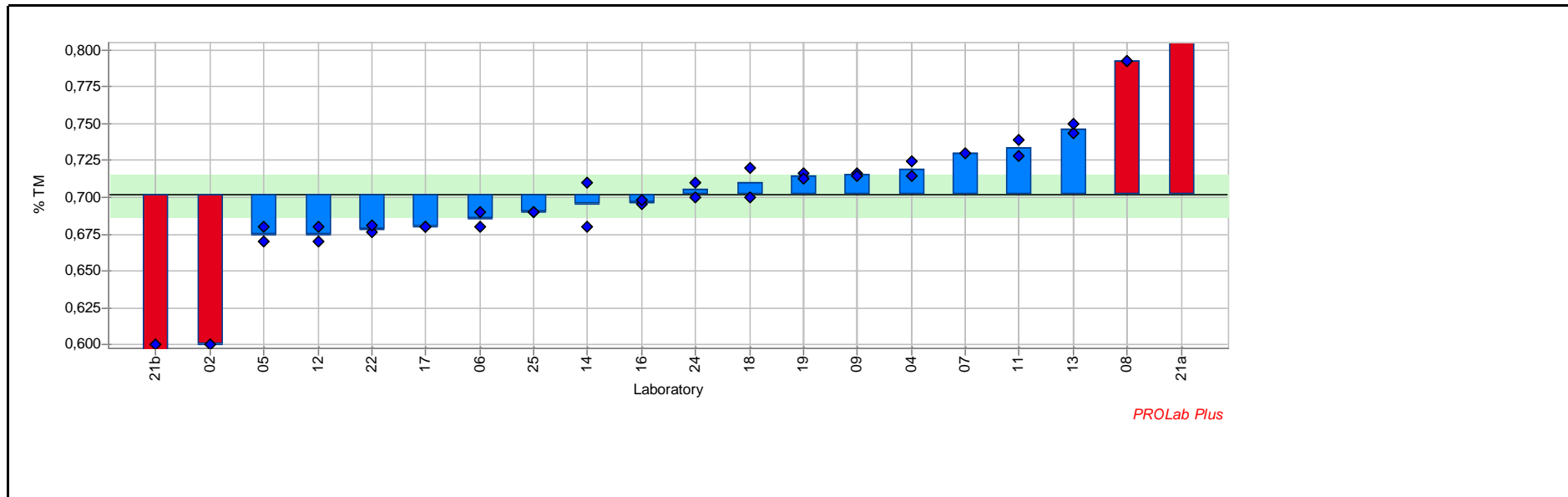


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 2,862    | 0,000 | -0,156  | 2,862   | 2,862   | ISO 17025        | XRF (fusion)           |         |
| 09       | 2,695    | 0,021 | -1,173  | 2,710   | 2,680   | ISO 17025        | XRF (fusion)           |         |
| 11       | 2,939    | 0,006 | 0,316   | 2,944   | 2,935   | no accreditation | XRF (fusion)           |         |
| 12       | 2,340    | 0,057 | -3,335  | 2,380   | 2,300   | no accreditation | XRF (fusion)           |         |
| 13       | 2,806    | 0,003 | -0,497  | 2,808   | 2,804   | no accreditation | XRF (fusion)           |         |
| 14       | 2,980    | 0,000 | 0,562   | 2,980   | 2,980   | no accreditation | XRF (fusion)           |         |
| 16       | 2,830    | 0,014 | -0,351  | 2,820   | 2,840   | no accreditation | Standardless info only |         |
| 17       | 3,445    | 0,007 | 3,394   | 3,450   | 3,440   | no accreditation | XRF (fusion)           |         |
| 18       | 2,960    | 0,000 | 0,440   | 2,960   | 2,960   | ISO 17025        | XRF (fusion)           |         |
| 19       | 2,849    | 0,013 | -0,239  | 2,858   | 2,839   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 3,092    | 0,011 | 1,244   | 3,084   | 3,100   | ISO 17025        | Standardless info only |         |
| 21b      | 2,660    | 0,000 | -1,386  | 2,660   | 2,660   | ISO 17025        | Standardless info only |         |
| 22       | 2,751    | 0,001 | -0,832  | 2,750   | 2,752   | ISO 17025        | XRF (fusion)           |         |
| 23       | 2,880    | 0,023 | -0,050  | 2,863   | 2,896   | ISO 17025        | XRF (fusion)           |         |
| 24       | 2,840    | 0,014 | -0,290  | 2,830   | 2,850   | ISO 17025        | XRF (fusion)           |         |
| 25       | 2,894    | 0,027 | 0,038   | 2,913   | 2,875   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 130      **Reprod. s.d.:** 0,026 % TM  
**Measurand:** K2O      **Repeat. s.d.:** 0,009 % TM  
**Mean ± U(Mean):** 0,701 ± 0,014 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 13      **Range of tolerance:** 0,649 - 0,753 % TM (|z-score| ≤ 2,000)  
**Assigned value:** 0,701 % TM (Empirical value)      **Target s.d.:** 0,026 % TM (Empirical value)



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 0,600    |       | -3,906  | 0,600   |         | no accreditation | XRF (fusion)      |         |
| 04       | 0,719    | 0,007 | 0,683   | 0,724   | 0,714   | no accreditation | XRF (fusion)      |         |
| 05       | 0,675    | 0,007 | -1,014  | 0,680   | 0,670   | no accreditation | XRF (fusion)      |         |
| 06       | 0,685    | 0,007 | -0,628  | 0,690   | 0,680   | no accreditation | XRF (fusion)      |         |
| 07       | 0,730    |       | 1,107   | 0,730   |         | no accreditation | XRF (fusion)      |         |

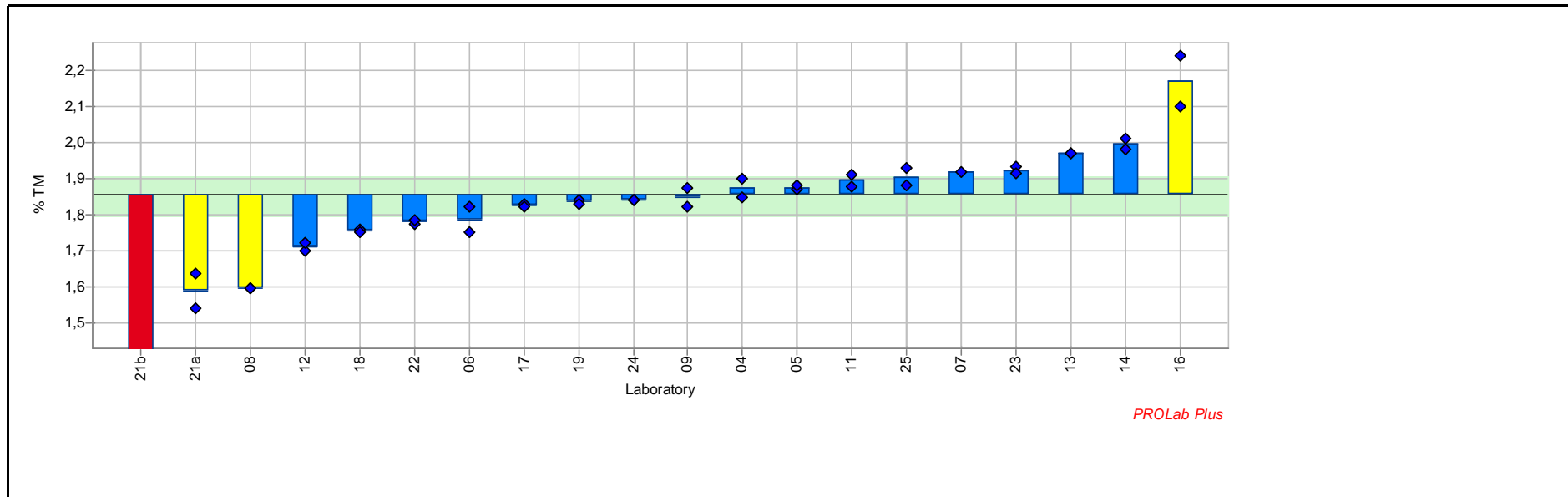


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 0,792    | 0,000 | 3,498   | 0,792   | 0,792   | no accreditation | other                  | AAS     |
| 09       | 0,715    | 0,001 | 0,529   | 0,716   | 0,714   | ISO 17025        | XRF (fusion)           |         |
| 11       | 0,734    | 0,008 | 1,242   | 0,728   | 0,739   | no accreditation | XRF (fusion)           |         |
| 12       | 0,675    | 0,007 | -1,014  | 0,670   | 0,680   | no accreditation | XRF (fusion)           |         |
| 13       | 0,746    | 0,005 | 1,744   | 0,743   | 0,750   | no accreditation | XRF (fusion)           |         |
| 14       | 0,695    | 0,021 | -0,242  | 0,710   | 0,680   | no accreditation | XRF (fusion)           |         |
| 16       | 0,696    | 0,002 | -0,184  | 0,695   | 0,698   | no accreditation | Standardless info only |         |
| 17       | 0,680    | 0,000 | -0,821  | 0,680   | 0,680   | no accreditation | XRF (fusion)           |         |
| 18       | 0,710    | 0,014 | 0,336   | 0,700   | 0,720   | ISO 17025        | XRF (fusion)           |         |
| 19       | 0,714    | 0,002 | 0,510   | 0,716   | 0,713   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,829    | 0,016 | 4,925   | 0,818   | 0,840   | ISO 17025        | Standardless info only |         |
| 21b      | 0,595    | 0,007 | -4,099  | 0,590   | 0,600   | ISO 17025        | Standardless info only |         |
| 22       | 0,679    | 0,004 | -0,879  | 0,676   | 0,681   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,705    | 0,007 | 0,143   | 0,710   | 0,700   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,690    | 0,000 | -0,435  | 0,690   | 0,690   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 130                      **Reprod. s.d.** 0,106 % TM  
**Measurand:** MGO                              **Repeat. s.d** 0,017 % TM  
**Mean ± U(Mean):** 1,853 ± 0,055 % TM                      **Statistical method** Q/Hampel  
**No. of laboratories:** 15                      **Range of tolerance:** 1,641 - 2,066 % TM (|z-score| <= 2,000)  
**Assigned value** 1,853 % TM (Empirical value)                      **Target s.d.** 0,106 % TM (Empirical value)



PROLab Plus

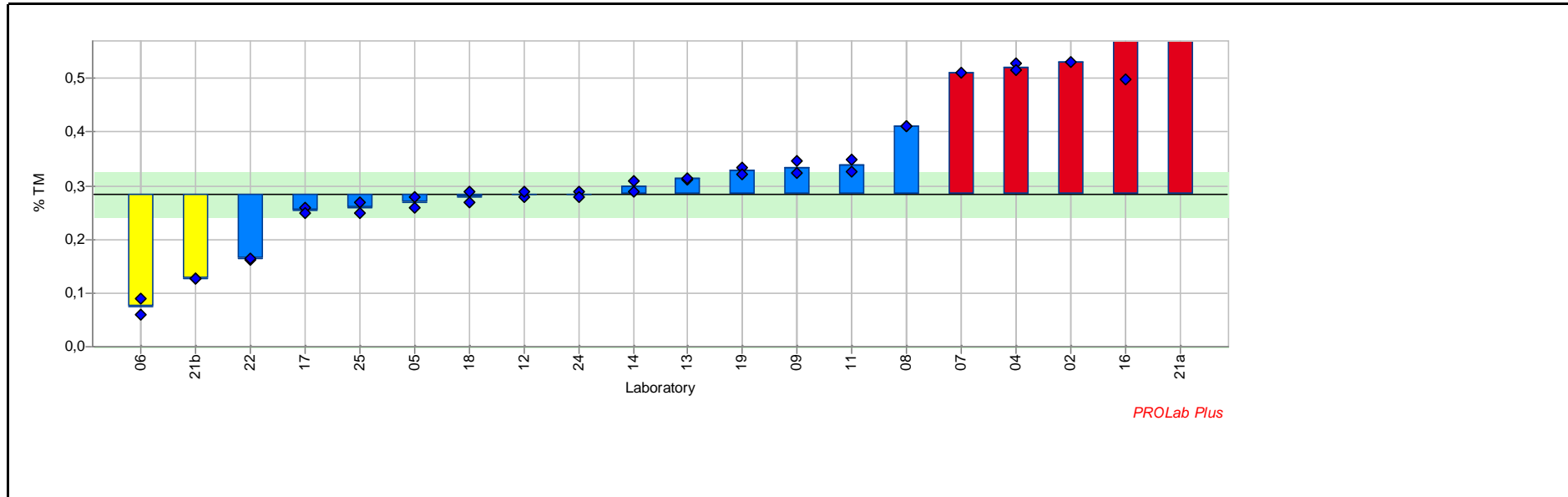
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 04       | 1,873    | 0,036 | 0,181   | 1,898   | 1,847   | no accreditation | XRF (fusion)      |         |
| 05       | 1,875    | 0,007 | 0,204   | 1,870   | 1,880   | no accreditation | XRF (fusion)      |         |
| 06       | 1,785    | 0,049 | -0,642  | 1,750   | 1,820   | no accreditation | XRF (fusion)      |         |
| 07       | 1,920    |       | 0,627   | 1,920   |         | no accreditation | XRF (fusion)      |         |
| 08       | 1,595    | 0,000 | -2,429  | 1,595   | 1,595   | ISO 17025        | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       | 1,848    | 0,039 | -0,054  | 1,875   | 1,820   | ISO 17025        | XRF (fusion)           |         |
| 11       | 1,894    | 0,023 | 0,388   | 1,878   | 1,911   | no accreditation | XRF (fusion)           |         |
| 12       | 1,710    | 0,014 | -1,348  | 1,700   | 1,720   | no accreditation | XRF (fusion)           |         |
| 13       | 1,970    | 0,001 | 1,098   | 1,969   | 1,971   | no accreditation | XRF (fusion)           |         |
| 14       | 1,995    | 0,021 | 1,333   | 2,010   | 1,980   | no accreditation | XRF (fusion)           |         |
| 16       | 2,170    | 0,099 | 2,979   | 2,100   | 2,240   | no accreditation | Standardless info only |         |
| 17       | 1,825    | 0,007 | -0,266  | 1,830   | 1,820   | no accreditation | XRF (fusion)           |         |
| 18       | 1,755    | 0,007 | -0,924  | 1,760   | 1,750   | ISO 17025        | XRF (fusion)           |         |
| 19       | 1,836    | 0,008 | -0,163  | 1,842   | 1,830   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 1,588    | 0,068 | -2,495  | 1,540   | 1,636   | ISO 17025        | Standardless info only |         |
| 21b      | 1,350    | 0,014 | -4,733  | 1,360   | 1,340   | ISO 17025        | Standardless info only |         |
| 22       | 1,779    | 0,008 | -0,699  | 1,773   | 1,785   | ISO 17025        | XRF (fusion)           |         |
| 23       | 1,923    | 0,012 | 0,660   | 1,932   | 1,915   | ISO 17025        | XRF (fusion)           |         |
| 24       | 1,840    | 0,000 | -0,125  | 1,840   | 1,840   | ISO 17025        | XRF (fusion)           |         |
| 25       | 1,905    | 0,035 | 0,486   | 1,930   | 1,880   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 130      **Reprod. s.d.:** 0,071 % TM  
**Measurand:** NA2O      **Repeat. s.d.:** 0,017 % TM  
**Mean ± U(Mean):** 0,285 ± 0,041 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 12      **Range of tolerance:** 0,142 - 0,428 % TM (|z-score| <= 2,000)  
**Assigned value:** 0,285 % TM (Empirical value)      **Target s.d.:** 0,071 % TM (Empirical value)



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 0,530    |       | 3,435   | 0,530   |         | no accreditation | XRF (fusion)      |         |
| 04       | 0,522    | 0,009 | 3,316   | 0,528   | 0,515   | no accreditation | XRF (fusion)      |         |
| 05       | 0,270    | 0,014 | -0,209  | 0,280   | 0,260   | no accreditation | XRF (fusion)      |         |
| 06       | 0,075    | 0,021 | -2,943  | 0,090   | 0,060   | no accreditation | XRF (fusion)      |         |
| 07       | 0,510    |       | 3,154   | 0,510   |         | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 0,412    | 0,000 | 1,781   | 0,412   | 0,412   | no accreditation | other                  | AAS     |
| 09       | 0,334    | 0,016 | 0,688   | 0,345   | 0,323   | ISO 17025        | XRF (fusion)           |         |
| 11       | 0,338    | 0,015 | 0,737   | 0,348   | 0,327   | no accreditation | XRF (fusion)           |         |
| 12       | 0,285    | 0,007 | 0,001   | 0,280   | 0,290   | no accreditation | XRF (Pellet) info only |         |
| 13       | 0,313    | 0,003 | 0,393   | 0,311   | 0,315   | no accreditation | XRF (fusion)           |         |
| 14       | 0,300    | 0,014 | 0,211   | 0,310   | 0,290   | no accreditation | XRF (fusion)           |         |
| 16       | 0,583    | 0,119 | 4,178   | 0,499   | 0,667   | no accreditation | Standardless info only |         |
| 17       | 0,255    | 0,007 | -0,420  | 0,260   | 0,250   | no accreditation | XRF (fusion)           |         |
| 18       | 0,280    | 0,014 | -0,069  | 0,290   | 0,270   | ISO 17025        | XRF (fusion)           |         |
| 19       | 0,328    | 0,008 | 0,604   | 0,334   | 0,322   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,650    |       | 5,117   | 0,650   | <0,180  | ISO 17025        | Standardless info only |         |
| 21b      | 0,127    | 0,001 | -2,221  | 0,126   | 0,127   | ISO 17025        | Standardless info only |         |
| 22       | 0,164    | 0,001 | -1,702  | 0,163   | 0,164   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,285    | 0,007 | 0,001   | 0,290   | 0,280   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,260    | 0,014 | -0,350  | 0,270   | 0,250   | no accreditation | XRF (fusion)           |         |

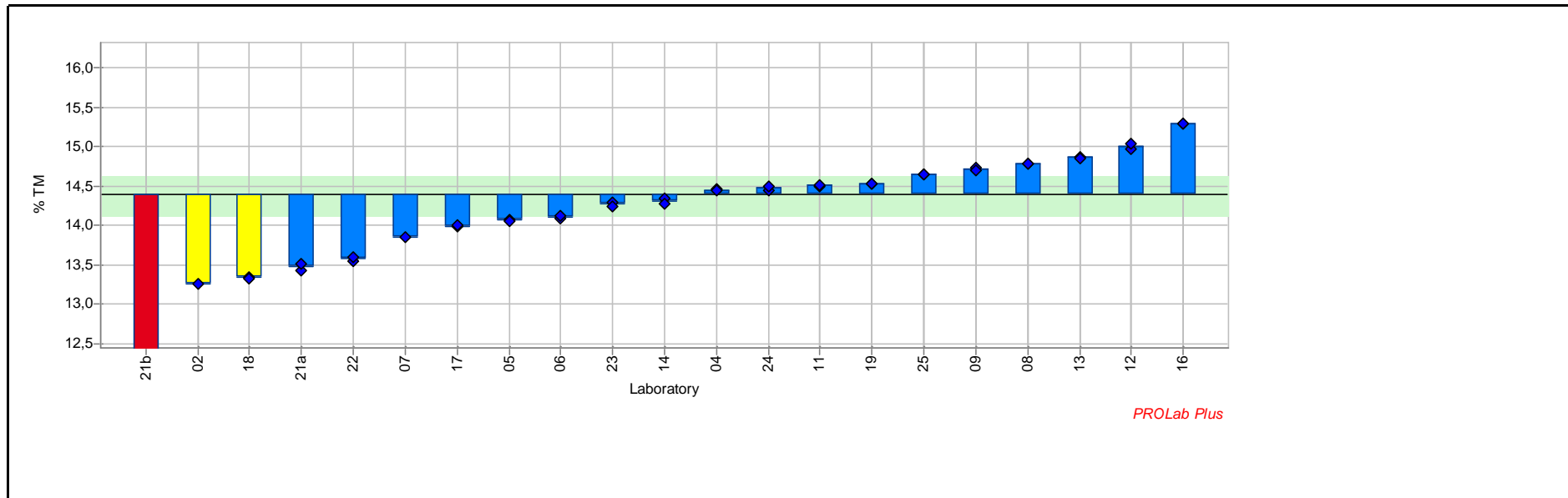


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 16       | 0,040    | 0,003 | -1,501  | 0,038   | 0,042   | no accreditation | Standardless info only |         |
| 17       | 0,040    | 0,000 | -1,501  | 0,040   | 0,040   | no accreditation | XRF (fusion)           |         |
| 19       | 0,062    | 0,000 | -0,467  | 0,062   | 0,062   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,039    |       | -1,548  | <0,010  | 0,039   | ISO 17025        | Standardless info only |         |
| 21b      | 0,049    | 0,001 | -1,078  | 0,050   | 0,048   | ISO 17025        | Standardless info only |         |
| 22       | 0,066    | 0,001 | -0,279  | 0,067   | 0,065   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,060    | 0,000 | -0,561  | 0,060   | 0,060   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,070    | 0,000 | -0,091  | 0,070   | 0,070   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                      |                            |   |
|-----------------------------|--------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                   | <b>Reprod. s.d.:</b>       | <b>0,486 % TM</b>                                   |
| <b>Measurand:</b>           | <b>SIO2</b>                          | <b>Repeat. s.d.:</b>       | <b>0,036 % TM</b>                                   |
| <b>Mean ± U(Mean):</b>      | <b>14,386 ± 0,251 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                                     |
| <b>No. of laboratories:</b> | <b>15</b>                            | <b>Range of tolerance:</b> | <b>13,414 - 15,358 % TM ( z-score  &lt;= 2,000)</b> |
| <b>Assigned value</b>       | <b>14,386 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,486 % TM (Empirical value)</b>                 |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 13,250   |       | -2,338  | 13,250  |         | no accreditation | XRF (fusion)      |         |
| 04       | 14,452   | 0,007 | 0,135   | 14,457  | 14,447  | no accreditation | XRF (fusion)      |         |
| 05       | 14,070   | 0,014 | -0,651  | 14,080  | 14,060  | no accreditation | XRF (fusion)      |         |
| 06       | 14,110   | 0,028 | -0,568  | 14,090  | 14,130  | no accreditation | XRF (fusion)      |         |
| 07       | 13,850   |       | -1,103  | 13,850  |         | no accreditation | XRF (fusion)      |         |



**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score       | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------------|---------|---------|------------------|------------------------|---------|
| 08       | 14,784   | 0,000 | 0,819         | 14,784  | 14,784  | ISO 17025        | XRF (fusion)           |         |
| 09       | 14,720   | 0,028 | 0,687         | 14,740  | 14,700  | ISO 17025        | XRF (fusion)           |         |
| 11       | 14,506   | 0,013 | 0,246         | 14,497  | 14,515  | no accreditation | XRF (fusion)           |         |
| 12       | 15,005   | 0,049 | 1,273         | 14,970  | 15,040  | no accreditation | XRF (fusion)           |         |
| 13       | 14,868   | 0,014 | 0,991         | 14,878  | 14,858  | no accreditation | XRF (fusion)           |         |
| 14       | 14,310   | 0,042 | -0,157        | 14,340  | 14,280  | no accreditation | XRF (fusion)           |         |
| 16       | 15,295   | 0,007 | 1,870         | 15,300  | 15,290  | no accreditation | Standardless info only |         |
| 17       | 13,995   | 0,007 | -0,805        | 13,990  | 14,000  | no accreditation | XRF (fusion)           |         |
| 18       | 13,340   | 0,014 | <b>-2,153</b> | 13,350  | 13,330  | ISO 17025        | XRF (fusion)           |         |
| 19       | 14,530   | 0,007 | 0,296         | 14,535  | 14,525  | ISO 17025        | XRF (fusion)           |         |
| 21a      | 13,475   | 0,064 | -1,875        | 13,430  | 13,520  | ISO 17025        | Standardless info only |         |
| 21b      | 9,995    | 0,120 | <b>-9,036</b> | 9,910   | 10,080  | ISO 17025        | Standardless info only |         |
| 22       | 13,572   | 0,026 | -1,676        | 13,553  | 13,590  | ISO 17025        | XRF (fusion)           |         |
| 23       | 14,270   | 0,039 | -0,240        | 14,297  | 14,242  | ISO 17025        | XRF (fusion)           |         |
| 24       | 14,475   | 0,035 | 0,183         | 14,450  | 14,500  | ISO 17025        | XRF (fusion)           |         |
| 25       | 14,643   | 0,002 | 0,529         | 14,645  | 14,642  | no accreditation | XRF (fusion)           |         |

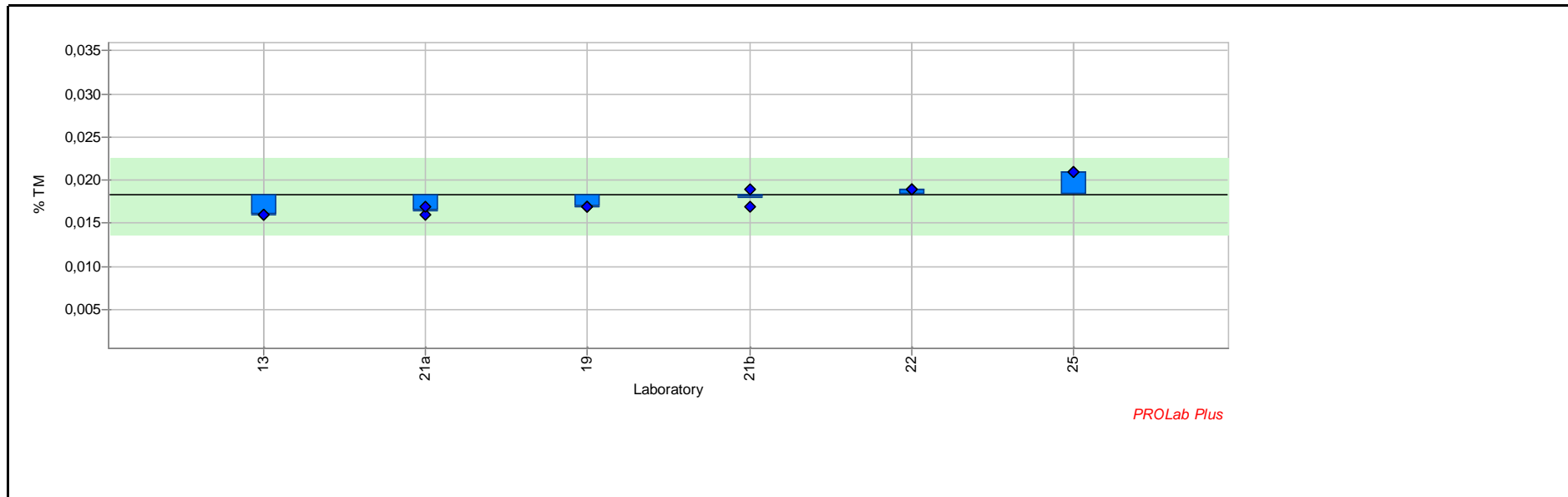


*RV130 (Cement)*

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 13       | 0,558    | 0,002 | -0,326  | 0,560   | 0,557   | no accreditation | XRF (fusion)           |         |
| 14       | 0,565    | 0,007 | 0,016   | 0,560   | 0,570   | no accreditation | XRF (fusion)           |         |
| 16       | 0,575    | 0,004 | 0,516   | 0,577   | 0,572   | no accreditation | Standardless info only |         |
| 17       | 0,565    | 0,007 | 0,016   | 0,560   | 0,570   | no accreditation | XRF (fusion)           |         |
| 19       | 0,558    | 0,003 | -0,353  | 0,560   | 0,556   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,635    | 0,009 | 3,675   | 0,628   | 0,641   | ISO 17025        | Standardless info only |         |
| 21b      | 0,480    | 0,021 | -4,459  | 0,495   | 0,465   | ISO 17025        | Standardless info only |         |
| 22       | 0,545    | 0,001 | -1,037  | 0,544   | 0,546   | ISO 17025        | XRF (fusion)           |         |
| 23       | 0,569    | 0,004 | 0,253   | 0,567   | 0,572   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,550    | 0,000 | -0,774  | 0,550   | 0,550   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,577    | 0,004 | 0,674   | 0,580   | 0,575   | no accreditation | XRF (fusion)           |         |

**RV130 (Cement)**

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                  | <b>Reprod. s.d.</b>        | <b>0,004 % TM</b>                             |
| <b>Measurand:</b>           | <b>ZNO</b>                          | <b>Repeat. s.d</b>         | <b>not available</b>                          |
| <b>Mean ± U(Mean):</b>      | <b>0,018 ± 0,004 % TM</b>           | <b>Statistical method</b>  | <b>Q/Hampel</b>                               |
| <b>No. of laboratories:</b> | <b>4</b>                            | <b>Range of tolerance:</b> | <b>0,009 - 0,027 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>0,018 % TM (Empirical value)</b> | <b>Target s.d.</b>         | <b>0,004 % TM (Empirical value)</b>           |



PROLab Plus

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES                |         |
| 13       | 0,016    | 0,000 | -0,507  | 0,016   | 0,016   | no accreditation | XRF (fusion)           |         |
| 19       | 0,017    | 0,000 | -0,282  | 0,017   | 0,017   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,017    | 0,001 | -0,394  | 0,016   | 0,017   | ISO 17025        | Standardless info only |         |
| 21b      | 0,018    | 0,001 | -0,056  | 0,019   | 0,017   | ISO 17025        | Standardless info only |         |

*RV130 (Cement)*

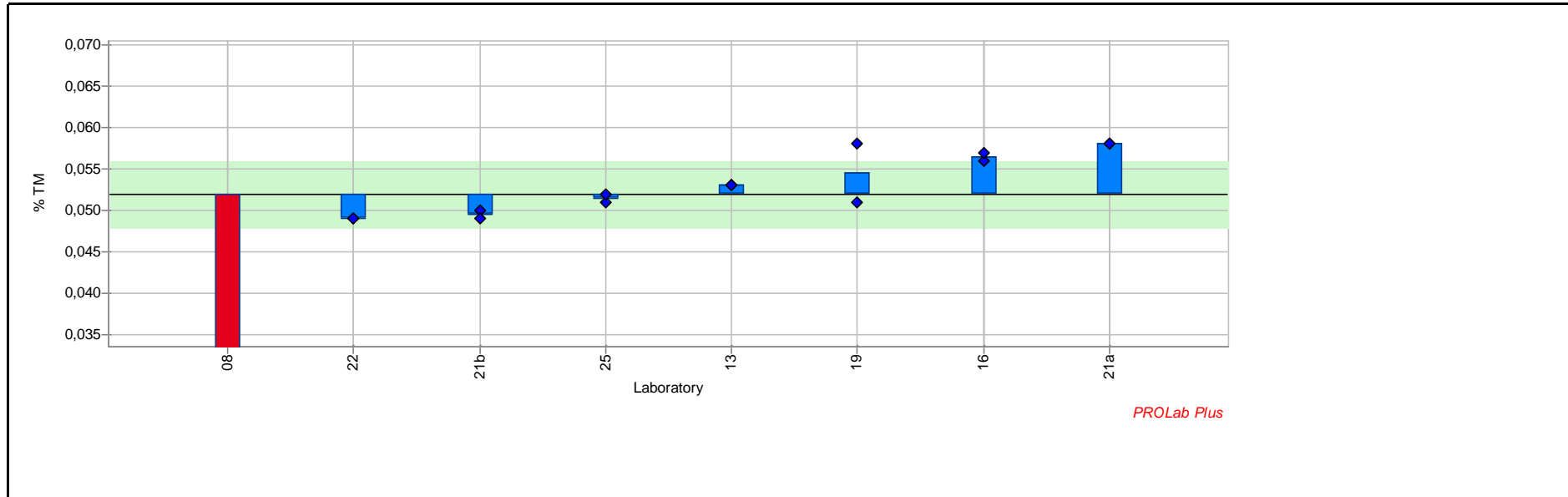
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| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 22       | 0,019    | 0,000 | 0,169   | 0,019   | 0,019   | ISO 17025        | XRF (fusion)      |         |
| 25       | 0,021    | 0,000 | 0,620   | 0,021   | 0,021   | no accreditation | XRF (fusion)      |         |

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RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                  | <b>Reprod. s.d.</b>        | <b>0,005 % TM</b>                                 |
| <b>Measurand:</b>           | <b>SRO</b>                          | <b>Repeat. s.d</b>         | <b>0,002 % TM</b>                                 |
| <b>Mean ± U(Mean):</b>      | <b>0,052 ± 0,004 % TM</b>           | <b>Statistical method</b>  | <b>Q/Hampel</b>                                   |
| <b>No. of laboratories:</b> | <b>5</b>                            | <b>Range of tolerance:</b> | <b>0,043 - 0,061 % TM ( z-score  &lt;= 2,000)</b> |
| <b>Assigned value</b>       | <b>0,052 % TM (Empirical value)</b> | <b>Target s.d.</b>         | <b>0,005 % TM (Empirical value)</b>               |



PROLab Plus

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 0,021    | 0,000 | -6,692  | 0,021   | 0,021   | ISO 17025        | XRF (fusion)           |         |
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES                |         |
| 13       | 0,053    | 0,000 | 0,216   | 0,053   | 0,053   | no accreditation | XRF (fusion)           |         |
| 16       | 0,057    | 0,001 | 0,971   | 0,056   | 0,057   | no accreditation | Standardless info only |         |
| 19       | 0,054    | 0,005 | 0,540   | 0,058   | 0,051   | ISO 17025        | XRF (fusion)           |         |

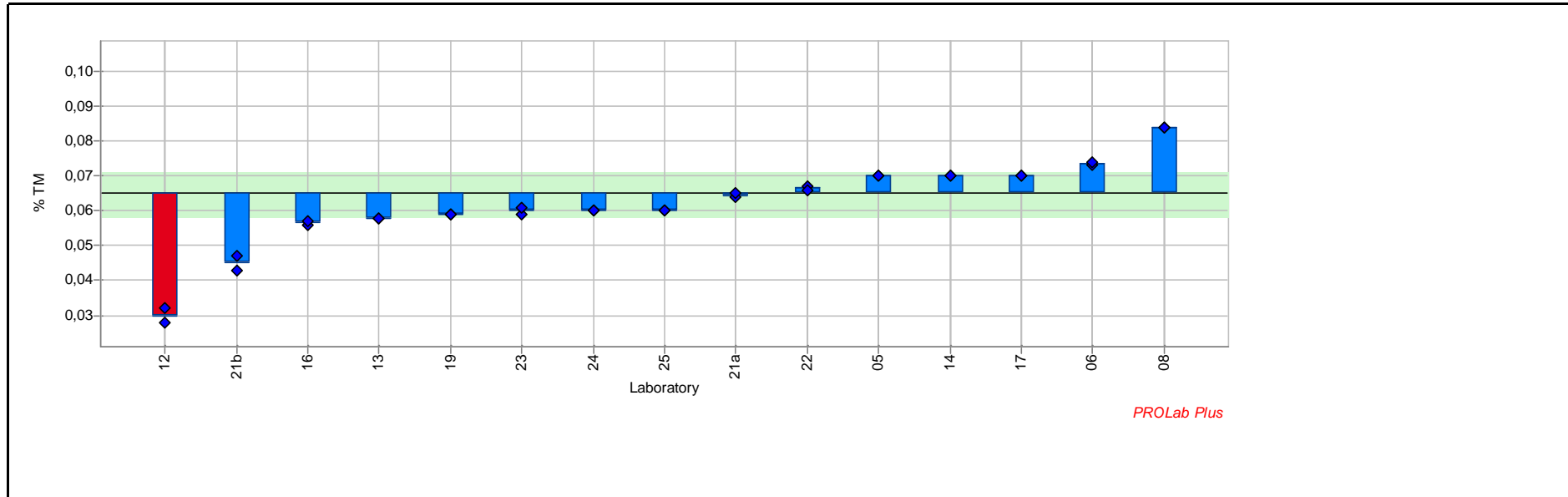
*RV130 (Cement)*

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| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 21a      | 0,058    | 0,000 | 1,295   | 0,058   | 0,058   | ISO 17025        | Standardless info only |         |
| 21b      | 0,050    | 0,001 | -0,540  | 0,050   | 0,049   | ISO 17025        | Standardless info only |         |
| 22       | 0,049    | 0,000 | -0,648  | 0,049   | 0,049   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,051    | 0,001 | -0,108  | 0,051   | 0,052   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                  | <b>Reprod. s.d.:</b>       | <b>0,011 % TM</b>                             |
| <b>Measurand:</b>           | <b>MN2O3</b>                        | <b>Repeat. s.d.:</b>       | <b>0,001 % TM</b>                             |
| <b>Mean ± U(Mean):</b>      | <b>0,065 ± 0,006 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                               |
| <b>No. of laboratories:</b> | <b>12</b>                           | <b>Range of tolerance:</b> | <b>0,043 - 0,087 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>0,065 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,011 % TM (Empirical value)</b>           |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 05       | 0,070    | 0,000 | 0,465   | 0,070   | 0,070   | no accreditation | XRF (fusion)      |         |
| 06       | 0,073    | 0,001 | 0,784   | 0,073   | 0,074   | no accreditation | XRF (fusion)      |         |
| 08       | 0,084    | 0,000 | 1,742   | 0,084   | 0,084   | ISO 17025        | XRF (fusion)      |         |
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES           |         |
| 12       | 0,030    | 0,003 | -3,182  | 0,028   | 0,032   | no accreditation | XRF (fusion)      |         |



**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 13       | 0,058    | 0,000 | -0,629  | 0,058   | 0,058   | no accreditation | XRF (fusion)           |         |
| 14       | 0,070    | 0,000 | 0,465   | 0,070   | 0,070   | no accreditation | XRF (fusion)           |         |
| 16       | 0,057    | 0,001 | -0,766  | 0,056   | 0,057   | no accreditation | Standardless info only |         |
| 17       | 0,070    | 0,000 | 0,465   | 0,070   | 0,070   | no accreditation | XRF (fusion)           |         |
| 19       | 0,059    | 0,000 | -0,538  | 0,059   | 0,059   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,065    | 0,001 | -0,036  | 0,064   | 0,065   | ISO 17025        | Standardless info only |         |
| 21b      | 0,045    | 0,003 | -1,815  | 0,047   | 0,043   | ISO 17025        | Standardless info only |         |
| 22       | 0,067    | 0,001 | 0,146   | 0,067   | 0,066   | ISO 17025        | XRF (fusion)           |         |
| 23       | 0,060    | 0,001 | -0,447  | 0,059   | 0,061   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,060    | 0,000 | -0,447  | 0,060   | 0,060   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,060    | 0,000 | -0,447  | 0,060   | 0,060   | no accreditation | XRF (fusion)           |         |

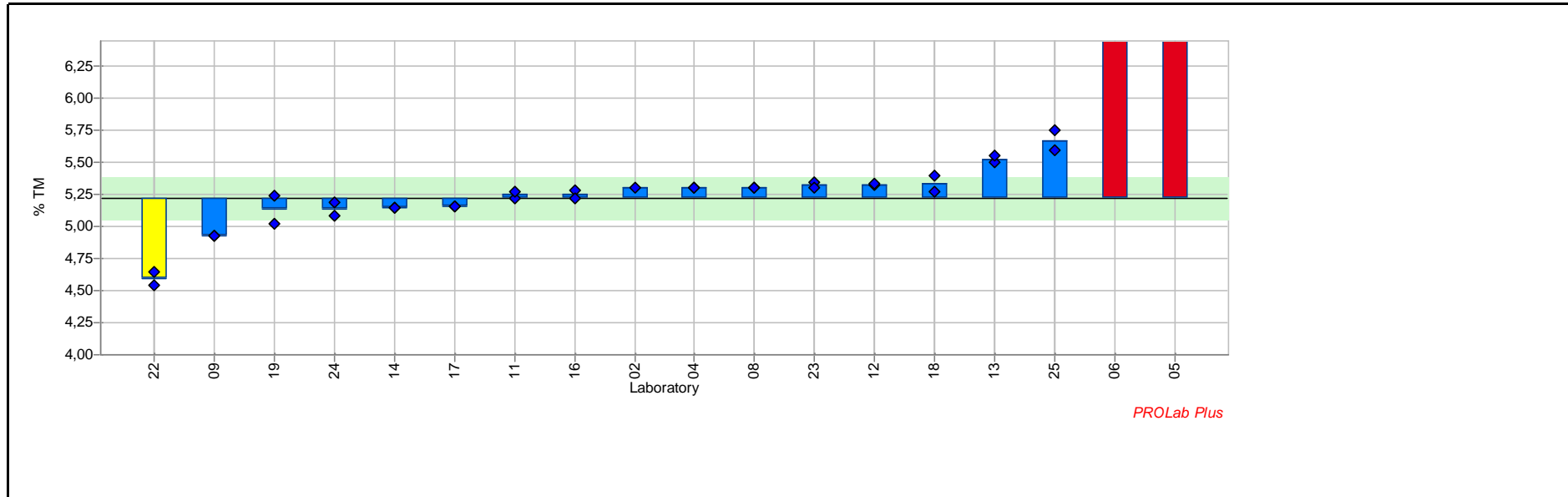


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment     |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|-------------|
| 08       | 11,193   | 0,000 | 0,279   | 11,193  | 11,193  | ISO 17025        | other                  | gravimetric |
| 09       | 11,325   | 0,007 | 0,508   | 11,330  | 11,320  | ISO 17025        | combustion             |             |
| 11       | 10,564   | 0,213 | -0,810  | 10,414  | 10,715  | no accreditation | XRF (fusion)           |             |
| 12       | 9,055    | 0,035 | -3,426  | 9,080   | 9,030   | no accreditation | combustion             |             |
| 13       | 7,198    | 0,006 | -6,645  | 7,194   | 7,202   | no accreditation | XRF (fusion)           |             |
| 14       | 11,120   | 0,014 | 0,153   | 11,130  | 11,110  | no accreditation | XRF (fusion)           |             |
| 16       | 3,900    | 0,198 | -12,361 | 4,040   | 3,760   | no accreditation | Standardless info only |             |
| 17       | 11,055   | 0,021 | 0,040   | 11,040  | 11,070  | no accreditation | XRF (fusion)           |             |
| 18       | 9,765    | 0,092 | -2,196  | 9,830   | 9,700   | ISO 17025        | XRF (fusion)           |             |
| 19       | 10,880   | 0,037 | -0,262  | 10,854  | 10,907  | ISO 17025        | XRF (fusion)           |             |
| 21a      | 7,618    | 0,058 | -5,917  | 7,577   | 7,659   | ISO 17025        | Standardless info only |             |
| 21b      | 8,042    | 0,013 | -5,182  | 8,051   | 8,033   | ISO 17025        | Standardless info only |             |
| 22       | 10,585   | 0,136 | -0,774  | 10,681  | 10,489  | ISO 17025        | combustion             |             |
| 23       | 11,124   | 0,039 | 0,161   | 11,097  | 11,152  | ISO 17025        | XRF (fusion)           |             |
| 24       | 10,595   | 0,007 | -0,757  | 10,590  | 10,600  | ISO 17025        | XRF (fusion)           |             |
| 25       | 11,355   | 0,233 | 0,560   | 11,190  | 11,520  | no accreditation | XRF (fusion)           |             |

RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 130</b>                  | <b>Reprod. s.d.:</b>       | <b>0,306 % TM</b>                             |
| <b>Measurand:</b>           | <b>Loss on Ignition</b>             | <b>Repeat. s.d.:</b>       | <b>0,046 % TM</b>                             |
| <b>Mean ± U(Mean):</b>      | <b>5,223 ± 0,157 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                               |
| <b>No. of laboratories:</b> | <b>15</b>                           | <b>Range of tolerance:</b> | <b>4,611 - 5,836 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>5,223 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,306 % TM (Empirical value)</b>           |



PROLab Plus

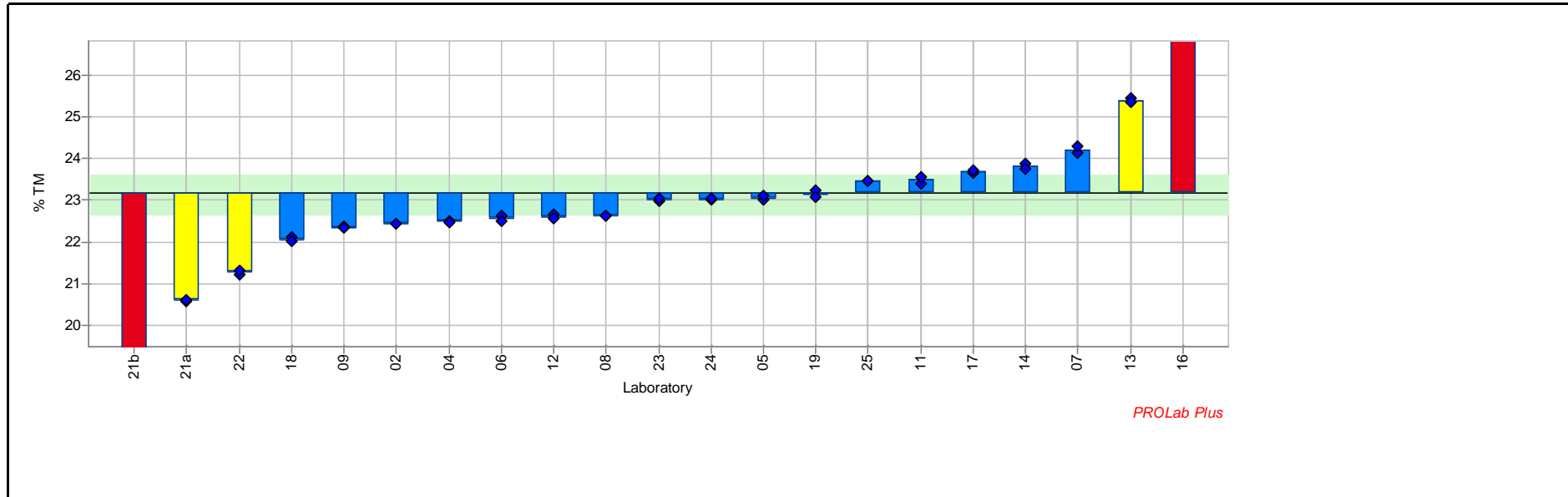
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 5,300    |       | 0,250   | 5,300   |         | no accreditation | 1h@950°C          |         |
| 04       | 5,300    | 0,000 | 0,250   | 5,300   | 5,300   | no accreditation | 1h@950°C          |         |
| 05       | 52,185   | 0,092 | 153,393 | 52,120  | 52,250  | no accreditation | 1h@950°C          |         |
| 06       | 10,610   | 0,000 | 17,595  | 10,610  | 10,610  | no accreditation | 1h@950°C          |         |
| 08       | 5,300    | 0,000 | 0,250   | 5,300   | 5,300   | ISO 17025        | 1h@950°C          |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 09       | 4,929    | 0,003 | -0,962  | 4,931   | 4,927   | ISO 17025        | 1h@950°C          |         |
| 11       | 5,245    | 0,035 | 0,071   | 5,220   | 5,270   | no accreditation | 1h@950°C          |         |
| 12       | 5,325    | 0,007 | 0,332   | 5,320   | 5,330   | no accreditation | 1h@950°C          |         |
| 13       | 5,525    | 0,038 | 0,985   | 5,498   | 5,552   | no accreditation | 1h@950°C          |         |
| 14       | 5,150    | 0,000 | -0,240  | 5,150   | 5,150   | no accreditation | 1h@950°C          |         |
| 16       | 5,251    | 0,042 | 0,089   | 5,280   | 5,221   | no accreditation | 1h@950°C          |         |
| 17       | 5,160    | 0,000 | -0,207  | 5,160   | 5,160   | no accreditation | 1h@950°C          |         |
| 18       | 5,335    | 0,092 | 0,365   | 5,400   | 5,270   | ISO 17025        | 1h@950°C          |         |
| 19       | 5,130    | 0,156 | -0,305  | 5,020   | 5,240   | ISO 17025        | 1h@950°C          |         |
| 22       | 4,590    | 0,071 | -2,069  | 4,640   | 4,540   | ISO 17025        | 1h@950°C          |         |
| 23       | 5,321    | 0,029 | 0,317   | 5,341   | 5,300   | ISO 17025        | 1h@950°C          |         |
| 24       | 5,135    | 0,078 | -0,289  | 5,190   | 5,080   | ISO 17025        | 1h@950°C          |         |
| 25       | 5,670    | 0,112 | 1,459   | 5,749   | 5,591   | no accreditation | 1h@950°C          |         |

RV130 (Cement)

|                             |                                      |                            |   |
|-----------------------------|--------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                   | <b>Reprod. s.d.:</b>       | <b>0,916 % TM</b>                               |
| <b>Measurand:</b>           | <b>AL2O3</b>                         | <b>Repeat. s.d.:</b>       | <b>0,092 % TM</b>                               |
| <b>Mean ± U(Mean):</b>      | <b>23,156 ± 0,472 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                                 |
| <b>No. of laboratories:</b> | <b>15</b>                            | <b>Range of tolerance:</b> | <b>21,323 - 24,989 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>23,156 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,916 % TM (Empirical value)</b>             |



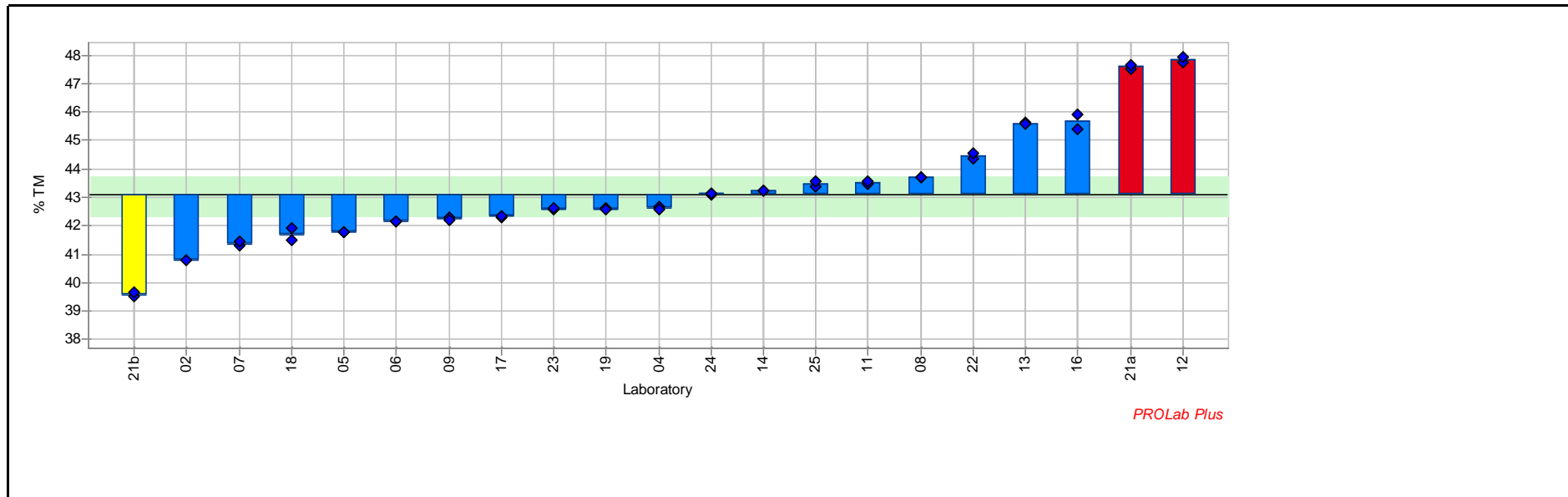
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 22,440   |       | -0,781  | 22,440  |         | no accreditation | XRF (fusion)      |         |
| 04       | 22,491   | 0,022 | -0,726  | 22,506  | 22,475  | no accreditation | XRF (fusion)      |         |
| 05       | 23,060   | 0,071 | -0,105  | 23,010  | 23,110  | no accreditation | XRF (fusion)      |         |
| 06       | 22,565   | 0,092 | -0,645  | 22,630  | 22,500  | no accreditation | XRF (fusion)      |         |
| 07       | 24,210   | 0,127 | 1,150   | 24,120  | 24,300  | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 22,618   | 0,000 | -0,587  | 22,618  | 22,618  | ISO 17025        | XRF (fusion)           |         |
| 09       | 22,345   | 0,021 | -0,885  | 22,360  | 22,330  | ISO 17025        | XRF (fusion)           |         |
| 11       | 23,478   | 0,106 | 0,351   | 23,403  | 23,553  | no accreditation | XRF (fusion)           |         |
| 12       | 22,600   | 0,071 | -0,607  | 22,650  | 22,550  | no accreditation | XRF (fusion)           |         |
| 13       | 25,393   | 0,065 | 2,441   | 25,439  | 25,347  | no accreditation | XRF (fusion)           |         |
| 14       | 23,820   | 0,099 | 0,725   | 23,890  | 23,750  | no accreditation | XRF (fusion)           |         |
| 16       | 27,485   | 0,474 | 4,724   | 27,820  | 27,150  | no accreditation | Standardless info only |         |
| 17       | 23,685   | 0,035 | 0,577   | 23,660  | 23,710  | no accreditation | XRF (fusion)           |         |
| 18       | 22,060   | 0,057 | -1,196  | 22,100  | 22,020  | ISO 17025        | XRF (fusion)           |         |
| 19       | 23,155   | 0,123 | -0,001  | 23,242  | 23,068  | ISO 17025        | XRF (fusion)           |         |
| 21a      | 20,600   | 0,014 | -2,789  | 20,590  | 20,610  | ISO 17025        | Standardless info only |         |
| 21b      | 16,830   | 0,014 | -6,903  | 16,820  | 16,840  | ISO 17025        | Standardless info only |         |
| 22       | 21,272   | 0,057 | -2,056  | 21,232  | 21,312  | ISO 17025        | XRF (fusion)           |         |
| 23       | 23,008   | 0,035 | -0,162  | 22,983  | 23,032  | ISO 17025        | XRF (fusion)           |         |
| 24       | 23,025   | 0,021 | -0,143  | 23,010  | 23,040  | ISO 17025        | XRF (fusion)           |         |
| 25       | 23,461   | 0,012 | 0,332   | 23,469  | 23,452  | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                      |                            |   |
|-----------------------------|--------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                   | <b>Reprod. s.d.:</b>       | <b>1,344 % TM</b>                               |
| <b>Measurand:</b>           | <b>CAO</b>                           | <b>Repeat. s.d.:</b>       | <b>0,054 % TM</b>                               |
| <b>Mean ± U(Mean):</b>      | <b>43,071 ± 0,694 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                                 |
| <b>No. of laboratories:</b> | <b>15</b>                            | <b>Range of tolerance:</b> | <b>40,382 - 45,760 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>43,071 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>1,344 % TM (Empirical value)</b>             |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 40,780   |       | -1,704  | 40,780  |         | no accreditation | XRF (fusion)      |         |
| 04       | 42,629   | 0,053 | -0,329  | 42,666  | 42,591  | no accreditation | XRF (fusion)      |         |
| 05       | 41,780   | 0,014 | -0,960  | 41,790  | 41,770  | no accreditation | XRF (fusion)      |         |
| 06       | 42,170   | 0,000 | -0,670  | 42,170  | 42,170  | no accreditation | XRF (fusion)      |         |
| 07       | 41,365   | 0,092 | -1,269  | 41,300  | 41,430  | no accreditation | XRF (fusion)      |         |



**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 43,701   | 0,000 | 0,469   | 43,701  | 43,701  | ISO 17025        | XRF (fusion)           |         |
| 09       | 42,265   | 0,064 | -0,600  | 42,310  | 42,220  | ISO 17025        | XRF (fusion)           |         |
| 11       | 43,517   | 0,083 | 0,332   | 43,458  | 43,576  | no accreditation | XRF (fusion)           |         |
| 12       | 47,830   | 0,127 | 3,540   | 47,740  | 47,920  | no accreditation | XRF (fusion)           |         |
| 13       | 45,606   | 0,001 | 1,886   | 45,607  | 45,606  | no accreditation | XRF (fusion)           |         |
| 14       | 43,225   | 0,007 | 0,115   | 43,230  | 43,220  | no accreditation | XRF (fusion)           |         |
| 16       | 45,655   | 0,346 | 1,922   | 45,410  | 45,900  | no accreditation | XRF (Pellet) info only |         |
| 17       | 42,335   | 0,035 | -0,547  | 42,310  | 42,360  | no accreditation | XRF (fusion)           |         |
| 18       | 41,700   | 0,283 | -1,020  | 41,900  | 41,500  | ISO 17025        | XRF (fusion)           |         |
| 19       | 42,600   | 0,029 | -0,350  | 42,621  | 42,580  | ISO 17025        | XRF (fusion)           |         |
| 21a      | 47,580   | 0,127 | 3,354   | 47,490  | 47,670  | ISO 17025        | Standardless info only |         |
| 21b      | 39,595   | 0,120 | -2,586  | 39,510  | 39,680  | ISO 17025        | Standardless info only |         |
| 22       | 44,472   | 0,136 | 1,042   | 44,376  | 44,568  | ISO 17025        | XRF (fusion)           |         |
| 23       | 42,590   | 0,040 | -0,357  | 42,562  | 42,619  | ISO 17025        | XRF (fusion)           |         |
| 24       | 43,120   | 0,042 | 0,036   | 43,090  | 43,150  | ISO 17025        | XRF (fusion)           |         |
| 25       | 43,475   | 0,120 | 0,301   | 43,390  | 43,560  | no accreditation | XRF (fusion)           |         |

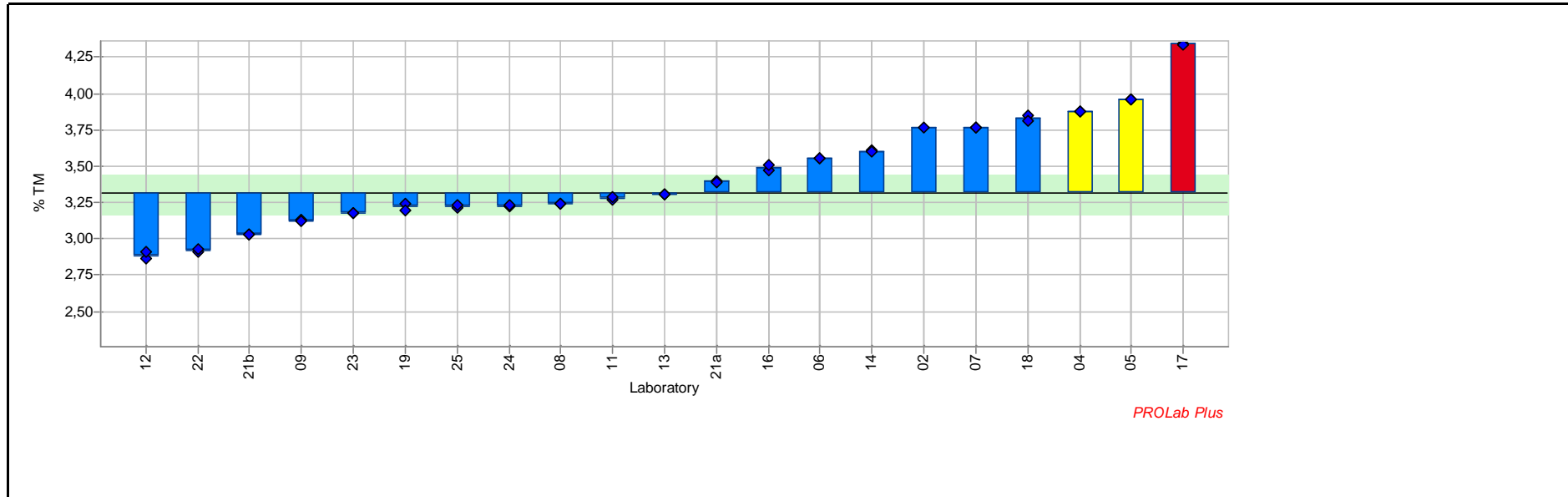


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | XRF (fusion)           |         |
| 13       | 0,002    | 0,001 | -2,615  | 0,001   | 0,002   | no accreditation | XRF (fusion)           |         |
| 14       | 0,045    | 0,007 | 0,587   | 0,040   | 0,050   | no accreditation | XRF (fusion)           |         |
| 16       | 0,065    | 0,040 | 2,022   | 0,036   | 0,093   | no accreditation | Standardless info only |         |
| 17       | 0,050    | 0,000 | 0,955   | 0,050   | 0,050   | no accreditation | XRF (fusion)           |         |
| 19       | 0,037    | 0,002 | 0,035   | 0,039   | 0,036   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,032    | 0,004 | -0,370  | 0,035   | 0,029   | ISO 17025        | Standardless info only |         |
| 21b      | 0,028    | 0,013 | -0,628  | 0,038   | 0,019   | ISO 17025        | Standardless info only |         |
| 22       | 0,032    | 0,001 | -0,407  | 0,031   | 0,032   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,040    | 0,000 | 0,219   | 0,040   | 0,040   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 131                      **Reprod. s.d.:** 0,263 % TM  
**Measurand:** FE2O3                          **Repeat. s.d.:** 0,008 % TM  
**Mean ± U(Mean):** 3,311 ± 0,136 % TM                      **Statistical method:** Q/Hampel  
**No. of laboratories:** 15                      **Range of tolerance:** 2,784 - 3,837 % TM (|z-score| <= 2,000)  
**Assigned value:** 3,311 % TM (Empirical value)                      **Target s.d.:** 0,263 % TM (Empirical value)



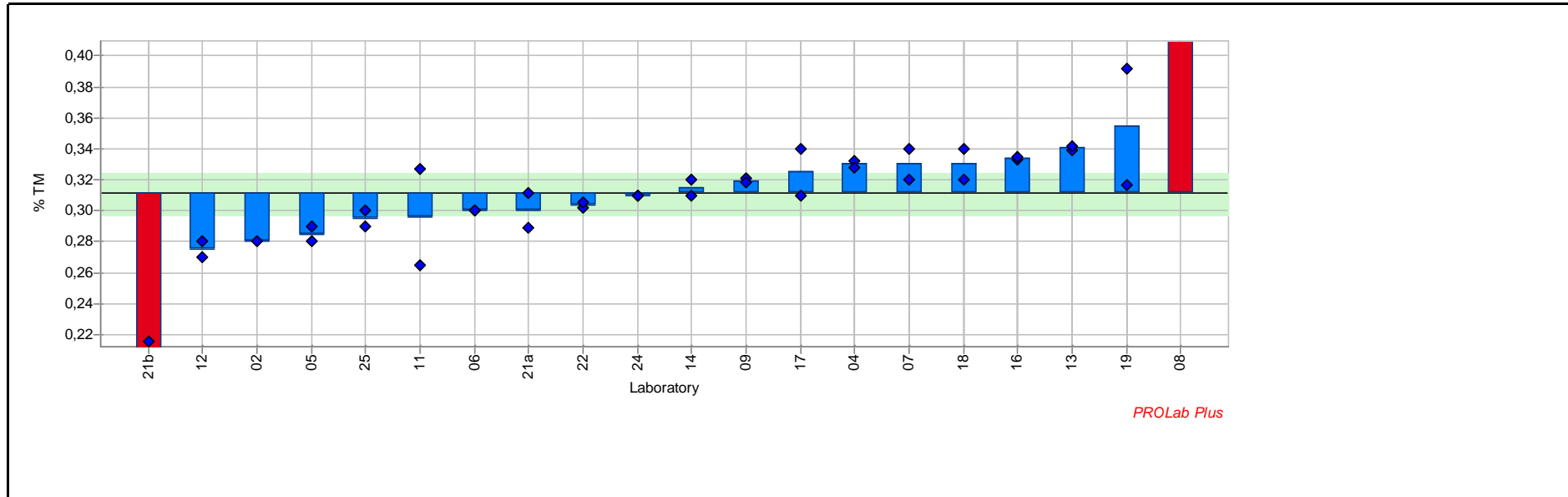
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 3,770    |       | 1,744   | 3,770   |         | no accreditation | XRF (fusion)      |         |
| 04       | 3,877    | 0,000 | 2,150   | 3,877   | 3,877   | no accreditation | XRF (fusion)      |         |
| 05       | 3,960    | 0,000 | 2,465   | 3,960   | 3,960   | no accreditation | XRF (fusion)      |         |
| 06       | 3,550    | 0,000 | 0,909   | 3,550   | 3,550   | no accreditation | XRF (fusion)      |         |
| 07       | 3,770    | 0,000 | 1,744   | 3,770   | 3,770   | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 3,244    | 0,000 | -0,253  | 3,244   | 3,244   | ISO 17025        | XRF (fusion)           |         |
| 09       | 3,125    | 0,006 | -0,703  | 3,130   | 3,121   | ISO 17025        | XRF (fusion)           |         |
| 11       | 3,276    | 0,014 | -0,132  | 3,266   | 3,286   | no accreditation | XRF (fusion)           |         |
| 12       | 2,885    | 0,035 | -1,617  | 2,860   | 2,910   | no accreditation | XRF (fusion)           |         |
| 13       | 3,306    | 0,000 | -0,018  | 3,306   | 3,306   | no accreditation | XRF (fusion)           |         |
| 14       | 3,605    | 0,007 | 1,117   | 3,610   | 3,600   | no accreditation | XRF (fusion)           |         |
| 16       | 3,490    | 0,028 | 0,681   | 3,470   | 3,510   | no accreditation | Standardless info only |         |
| 17       | 4,345    | 0,007 | 3,927   | 4,350   | 4,340   | no accreditation | XRF (fusion)           |         |
| 18       | 3,830    | 0,028 | 1,972   | 3,850   | 3,810   | ISO 17025        | XRF (fusion)           |         |
| 19       | 3,220    | 0,031 | -0,345  | 3,242   | 3,198   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 3,395    | 0,010 | 0,320   | 3,402   | 3,388   | ISO 17025        | Standardless info only |         |
| 21b      | 3,030    | 0,001 | -1,064  | 3,030   | 3,031   | ISO 17025        | Standardless info only |         |
| 22       | 2,920    | 0,008 | -1,484  | 2,914   | 2,926   | ISO 17025        | XRF (fusion)           |         |
| 23       | 3,177    | 0,001 | -0,508  | 3,176   | 3,178   | ISO 17025        | XRF (fusion)           |         |
| 24       | 3,225    | 0,007 | -0,326  | 3,220   | 3,230   | ISO 17025        | XRF (fusion)           |         |
| 25       | 3,224    | 0,010 | -0,329  | 3,217   | 3,231   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                  | <b>Reprod. s.d.:</b>       | <b>0,025 % TM</b>                             |
| <b>Measurand:</b>           | <b>K2O</b>                          | <b>Repeat. s.d.:</b>       | <b>0,009 % TM</b>                             |
| <b>Mean ± U(Mean):</b>      | <b>0,311 ± 0,013 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                               |
| <b>No. of laboratories:</b> | <b>13</b>                           | <b>Range of tolerance:</b> | <b>0,262 - 0,360 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>0,311 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,025 % TM (Empirical value)</b>           |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 0,280    |       | -1,253  | 0,280   |         | no accreditation | XRF (fusion)      |         |
| 04       | 0,330    | 0,003 | 0,771   | 0,332   | 0,328   | no accreditation | XRF (fusion)      |         |
| 05       | 0,285    | 0,007 | -1,051  | 0,290   | 0,280   | no accreditation | XRF (fusion)      |         |
| 06       | 0,300    | 0,000 | -0,444  | 0,300   | 0,300   | no accreditation | XRF (fusion)      |         |
| 07       | 0,330    | 0,014 | 0,771   | 0,340   | 0,320   | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 0,450    | 0,000 | 5,628   | 0,450   | 0,450   | no accreditation | other                  | AAS     |
| 09       | 0,320    | 0,002 | 0,346   | 0,321   | 0,318   | ISO 17025        | XRF (fusion)           |         |
| 11       | 0,296    | 0,044 | -0,606  | 0,327   | 0,265   | no accreditation | XRF (fusion)           |         |
| 12       | 0,275    | 0,007 | -1,456  | 0,280   | 0,270   | no accreditation | XRF (fusion)           |         |
| 13       | 0,341    | 0,002 | 1,196   | 0,339   | 0,342   | no accreditation | XRF (fusion)           |         |
| 14       | 0,315    | 0,007 | 0,163   | 0,320   | 0,310   | no accreditation | XRF (fusion)           |         |
| 16       | 0,334    | 0,001 | 0,933   | 0,333   | 0,335   | no accreditation | Standardless info only |         |
| 17       | 0,325    | 0,021 | 0,568   | 0,340   | 0,310   | no accreditation | XRF (fusion)           |         |
| 18       | 0,330    | 0,014 | 0,771   | 0,320   | 0,340   | ISO 17025        | XRF (fusion)           |         |
| 19       | 0,355    | 0,053 | 1,762   | 0,392   | 0,317   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,300    | 0,016 | -0,444  | 0,289   | 0,311   | ISO 17025        | Standardless info only |         |
| 21b      | 0,206    | 0,015 | -4,269  | 0,216   | 0,195   | ISO 17025        | Standardless info only |         |
| 22       | 0,303    | 0,002 | -0,302  | 0,302   | 0,305   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,310    | 0,000 | -0,039  | 0,310   | 0,310   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,295    | 0,007 | -0,646  | 0,300   | 0,290   | no accreditation | XRF (fusion)           |         |



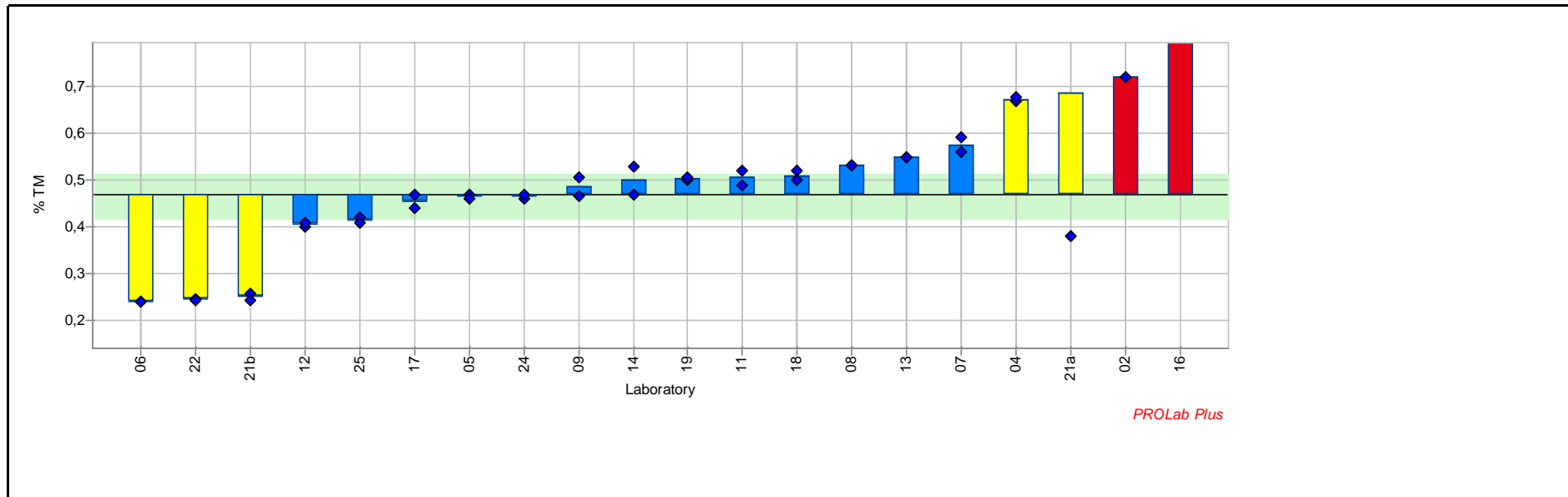


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       | 1,635    | 0,003 | -0,504  | 1,637   | 1,633   | ISO 17025        | XRF (fusion)           |         |
| 11       | 1,765    | 0,001 | 0,841   | 1,766   | 1,765   | no accreditation | XRF (fusion)           |         |
| 12       | 1,545    | 0,035 | -1,432  | 1,520   | 1,570   | no accreditation | XRF (fusion)           |         |
| 13       | 1,807    | 0,000 | 1,269   | 1,807   | 1,807   | no accreditation | XRF (fusion)           |         |
| 14       | 1,820    | 0,028 | 1,403   | 1,840   | 1,800   | no accreditation | XRF (fusion)           |         |
| 16       | 2,135    | 0,035 | 4,651   | 2,160   | 2,110   | no accreditation | Standardless info only |         |
| 17       | 1,685    | 0,007 | 0,011   | 1,690   | 1,680   | no accreditation | XRF (fusion)           |         |
| 18       | 1,755    | 0,007 | 0,733   | 1,760   | 1,750   | ISO 17025        | XRF (fusion)           |         |
| 19       | 1,617    | 0,007 | -0,690  | 1,612   | 1,622   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 1,469    | 0,076 | -2,221  | 1,415   | 1,522   | ISO 17025        | Standardless info only |         |
| 21b      | 1,105    | 0,035 | -5,969  | 1,130   | 1,080   | ISO 17025        | Standardless info only |         |
| 22       | 1,633    | 0,008 | -0,520  | 1,628   | 1,639   | ISO 17025        | XRF (fusion)           |         |
| 23       | 1,667    | 0,016 | -0,174  | 1,656   | 1,678   | ISO 17025        | XRF (fusion)           |         |
| 24       | 1,670    | 0,014 | -0,143  | 1,680   | 1,660   | ISO 17025        | XRF (fusion)           |         |
| 25       | 1,715    | 0,007 | 0,321   | 1,710   | 1,720   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 131      **Reprod. s.d.:** 0,081 % TM  
**Measurand:** NA2O      **Repeat. s.d.:** 0,010 % TM  
**Mean ± U(Mean):** 0,467 ± 0,047 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 12      **Range of tolerance:** 0,305 - 0,630 % TM (|z-score| <= 2,000)  
**Assigned value:** 0,467 % TM (Empirical value)      **Target s.d.:** 0,081 % TM (Empirical value)



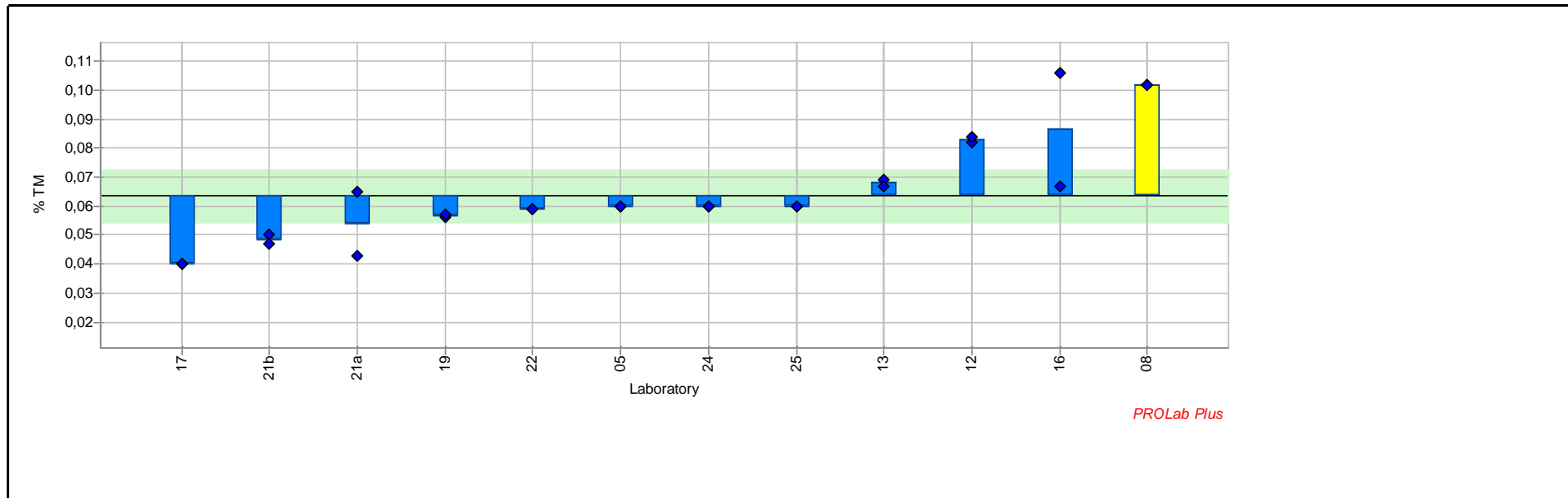
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 0,720    |       | 3,100   | 0,720   |         | no accreditation | XRF (fusion)      |         |
| 04       | 0,671    | 0,006 | 2,504   | 0,667   | 0,676   | no accreditation | XRF (fusion)      |         |
| 05       | 0,465    | 0,007 | -0,030  | 0,470   | 0,460   | no accreditation | XRF (fusion)      |         |
| 06       | 0,240    | 0,000 | -2,792  | 0,240   | 0,240   | no accreditation | XRF (fusion)      |         |
| 07       | 0,575    | 0,021 | 1,320   | 0,560   | 0,590   | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 0,532    | 0,000 | 0,792   | 0,532   | 0,532   | no accreditation | other                  | AAS     |
| 09       | 0,486    | 0,027 | 0,228   | 0,467   | 0,505   | ISO 17025        | XRF (fusion)           |         |
| 11       | 0,506    | 0,022 | 0,467   | 0,521   | 0,490   | no accreditation | XRF (fusion)           |         |
| 12       | 0,405    | 0,007 | -0,767  | 0,400   | 0,410   | no accreditation | XRF (Pellet) info only |         |
| 13       | 0,548    | 0,001 | 0,995   | 0,548   | 0,549   | no accreditation | XRF (fusion)           |         |
| 14       | 0,500    | 0,042 | 0,399   | 0,530   | 0,470   | no accreditation | XRF (fusion)           |         |
| 16       | 0,945    | 0,035 | 5,855   | 0,920   | 0,969   | no accreditation | Standardless info only |         |
| 17       | 0,455    | 0,021 | -0,153  | 0,470   | 0,440   | no accreditation | XRF (fusion)           |         |
| 18       | 0,510    | 0,014 | 0,522   | 0,520   | 0,500   | ISO 17025        | XRF (fusion)           |         |
| 19       | 0,504    | 0,004 | 0,449   | 0,501   | 0,507   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,685    | 0,431 | 2,670   | 0,990   | 0,380   | ISO 17025        | Standardless info only |         |
| 21b      | 0,252    | 0,011 | -2,651  | 0,259   | 0,244   | ISO 17025        | Standardless info only |         |
| 22       | 0,246    | 0,003 | -2,718  | 0,248   | 0,244   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,465    | 0,007 | -0,030  | 0,460   | 0,470   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,415    | 0,007 | -0,644  | 0,420   | 0,410   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 131                      **Reprod. s.d.:** 0,013 % TM  
**Measurand:** P2O5                              **Repeat. s.d.:** 0,001 % TM  
**Mean ± U(Mean):** 0,064 ± 0,009 % TM                      **Statistical method:** Q/Hampel  
**No. of laboratories:** 9                      **Range of tolerance:** 0,037 - 0,090 % TM (|z-score| ≤ 2,000)  
**Assigned value:** 0,064 % TM (Empirical value)                      **Target s.d.:** 0,013 % TM (Empirical value)



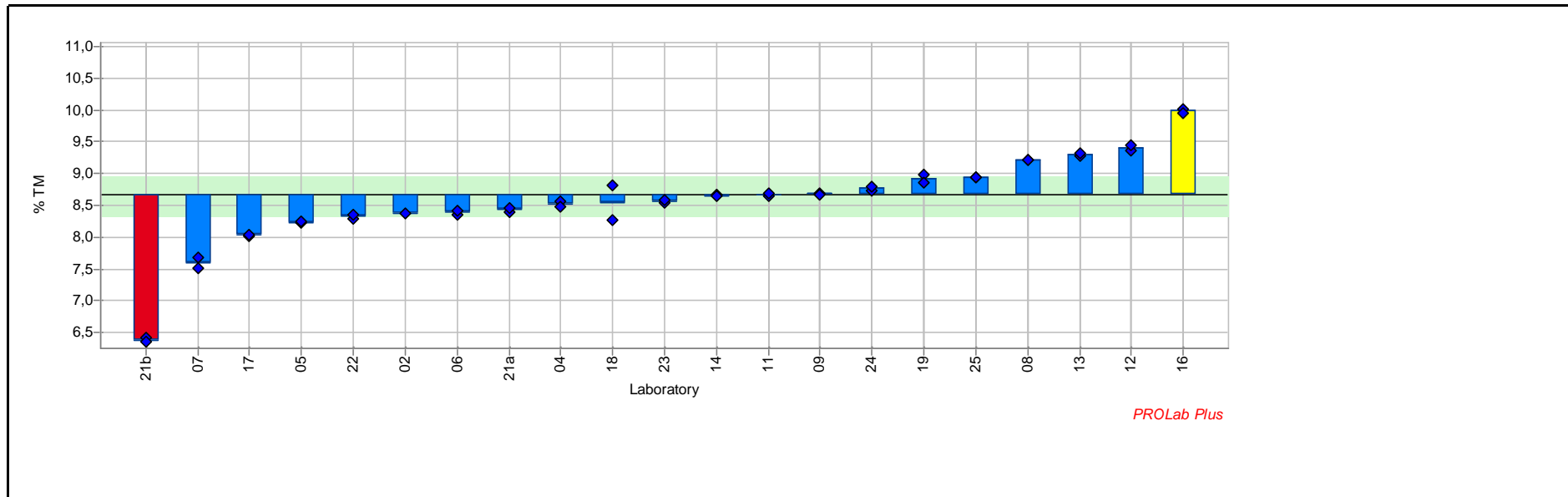
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 05       | 0,060    | 0,000 | -0,287  | 0,060   | 0,060   | no accreditation | XRF (fusion)      |         |
| 08       | 0,102    | 0,000 | 2,899   | 0,102   | 0,102   | ISO 17025        | XRF (fusion)      |         |
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | XRF (fusion)      |         |
| 12       | 0,083    | 0,001 | 1,457   | 0,082   | 0,084   | no accreditation | XRF (fusion)      |         |
| 13       | 0,068    | 0,001 | 0,320   | 0,069   | 0,067   | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 16       | 0,086    | 0,028 | 1,723   | 0,067   | 0,106   | no accreditation | Standardless info only |         |
| 17       | 0,040    | 0,000 | -1,804  | 0,040   | 0,040   | no accreditation | XRF (fusion)           |         |
| 19       | 0,057    | 0,001 | -0,553  | 0,056   | 0,057   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,054    | 0,016 | -0,742  | 0,065   | 0,043   | ISO 17025        | Standardless info only |         |
| 21b      | 0,049    | 0,002 | -1,159  | 0,050   | 0,047   | ISO 17025        | Standardless info only |         |
| 22       | 0,059    | 0,000 | -0,363  | 0,059   | 0,059   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,060    | 0,000 | -0,287  | 0,060   | 0,060   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,060    | 0,000 | -0,287  | 0,060   | 0,060   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 131                      **Reprod. s.d.:** 0,601 % TM  
**Measurand:** SIO2                              **Repeat. s.d.:** 0,043 % TM  
**Mean ± U(Mean):** 8,659 ± 0,310 % TM                      **Statistical method:** Q/Hampel  
**No. of laboratories:** 15                      **Range of tolerance:** 7,456 - 9,861 % TM (|z-score| <= 2,000)  
**Assigned value:** 8,659 % TM (Empirical value)                      **Target s.d.:** 0,601 % TM (Empirical value)



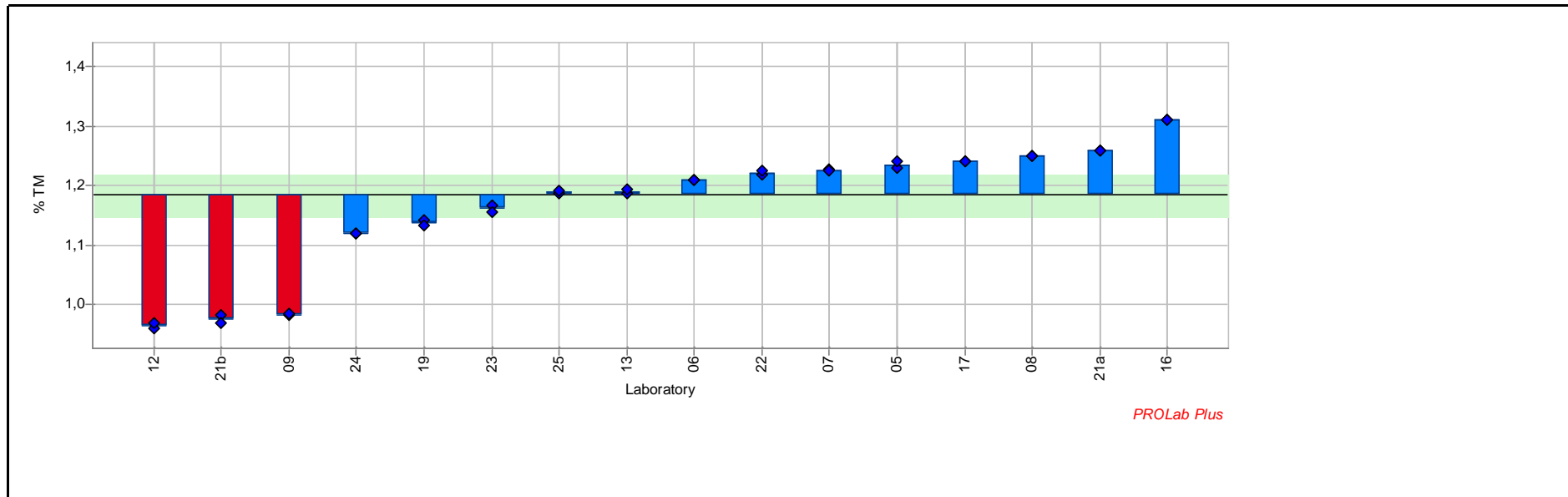
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 8,380    |       | -0,463  | 8,380   |         | no accreditation | XRF (fusion)      |         |
| 04       | 8,524    | 0,048 | -0,224  | 8,558   | 8,490   | no accreditation | XRF (fusion)      |         |
| 05       | 8,235    | 0,007 | -0,704  | 8,230   | 8,240   | no accreditation | XRF (fusion)      |         |
| 06       | 8,390    | 0,042 | -0,447  | 8,360   | 8,420   | no accreditation | XRF (fusion)      |         |
| 07       | 7,600    | 0,127 | -1,760  | 7,510   | 7,690   | no accreditation | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 08       | 9,221    | 0,000 | 0,935   | 9,221   | 9,221   | ISO 17025        | XRF (fusion)           |         |
| 09       | 8,680    | 0,020 | 0,036   | 8,694   | 8,666   | ISO 17025        | XRF (fusion)           |         |
| 11       | 8,670    | 0,035 | 0,019   | 8,645   | 8,695   | no accreditation | XRF (fusion)           |         |
| 12       | 9,410    | 0,057 | 1,250   | 9,370   | 9,450   | no accreditation | XRF (fusion)           |         |
| 13       | 9,303    | 0,023 | 1,072   | 9,287   | 9,320   | no accreditation | XRF (fusion)           |         |
| 14       | 8,655    | 0,007 | -0,006  | 8,660   | 8,650   | no accreditation | XRF (fusion)           |         |
| 16       | 9,985    | 0,035 | 2,206   | 10,010  | 9,960   | no accreditation | Standardless info only |         |
| 17       | 8,030    | 0,014 | -1,045  | 8,020   | 8,040   | no accreditation | XRF (fusion)           |         |
| 18       | 8,545    | 0,389 | -0,189  | 8,270   | 8,820   | ISO 17025        | XRF (fusion)           |         |
| 19       | 8,921    | 0,098 | 0,436   | 8,990   | 8,852   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 8,428    | 0,037 | -0,384  | 8,401   | 8,454   | ISO 17025        | Standardless info only |         |
| 21b      | 6,385    | 0,049 | -3,781  | 6,420   | 6,350   | ISO 17025        | Standardless info only |         |
| 22       | 8,324    | 0,040 | -0,556  | 8,296   | 8,352   | ISO 17025        | XRF (fusion)           |         |
| 23       | 8,567    | 0,023 | -0,151  | 8,551   | 8,584   | ISO 17025        | XRF (fusion)           |         |
| 24       | 8,770    | 0,042 | 0,185   | 8,740   | 8,800   | ISO 17025        | XRF (fusion)           |         |
| 25       | 8,945    | 0,001 | 0,476   | 8,946   | 8,944   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                  | <b>Reprod. s.d.</b>        | <b>0,064 % TM</b>                                 |
| <b>Measurand:</b>           | <b>TIO2</b>                         | <b>Repeat. s.d</b>         | <b>0,005 % TM</b>                                 |
| <b>Mean ± U(Mean):</b>      | <b>1,184 ± 0,036 % TM</b>           | <b>Statistical method</b>  | <b>Q/Hampel</b>                                   |
| <b>No. of laboratories:</b> | <b>13</b>                           | <b>Range of tolerance:</b> | <b>1,055 - 1,312 % TM ( z-score  &lt;= 2,000)</b> |
| <b>Assigned value</b>       | <b>1,184 % TM (Empirical value)</b> | <b>Target s.d.</b>         | <b>0,064 % TM (Empirical value)</b>               |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 05       | 1,235    | 0,007 | 0,798   | 1,230   | 1,240   | no accreditation | XRF (fusion)      |         |
| 06       | 1,210    | 0,000 | 0,408   | 1,210   | 1,210   | no accreditation | XRF (fusion)      |         |
| 07       | 1,226    | 0,001 | 0,658   | 1,227   | 1,225   | no accreditation | XRF (fusion)      |         |
| 08       | 1,249    | 0,000 | 1,016   | 1,249   | 1,249   | ISO 17025        | XRF (fusion)      |         |
| 09       | 0,984    | 0,002 | -3,117  | 0,982   | 0,985   | ISO 17025        | XRF (fusion)      |         |

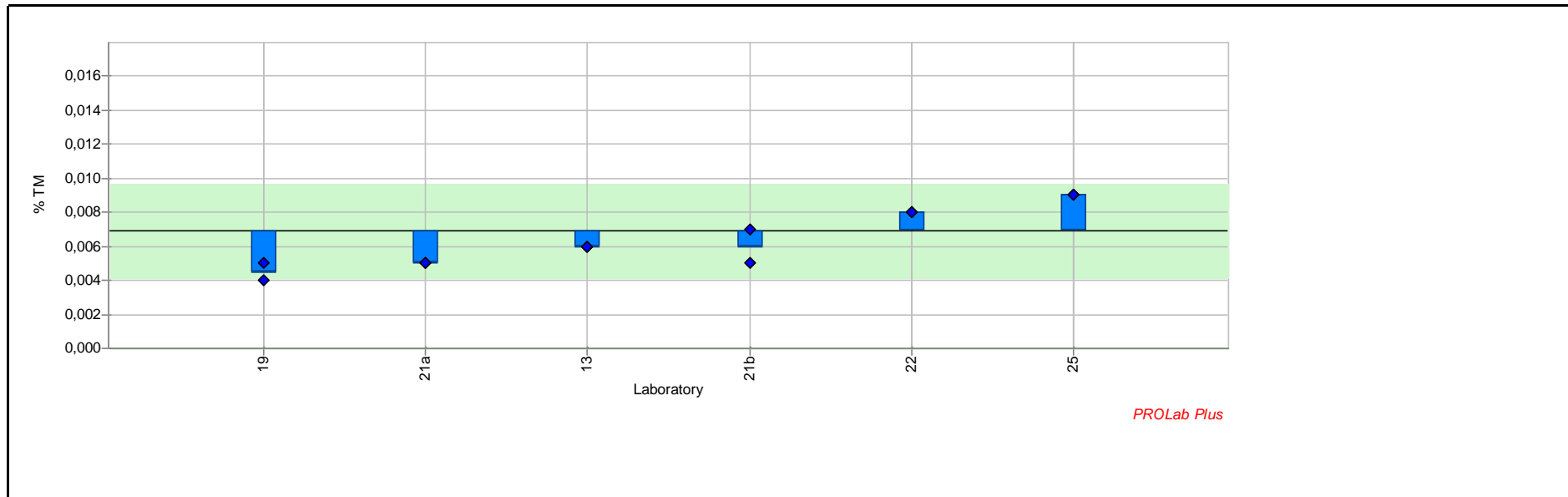


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 12       | 0,965    | 0,007 | -3,405  | 0,960   | 0,970   | no accreditation | XRF (fusion)           |         |
| 13       | 1,190    | 0,004 | 0,097   | 1,187   | 1,193   | no accreditation | XRF (fusion)           |         |
| 16       | 1,310    | 0,000 | 1,965   | 1,310   | 1,310   | no accreditation | Standardless info only |         |
| 17       | 1,240    | 0,000 | 0,875   | 1,240   | 1,240   | no accreditation | XRF (fusion)           |         |
| 19       | 1,138    | 0,006 | -0,712  | 1,142   | 1,134   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 1,259    | 0,001 | 1,171   | 1,260   | 1,258   | ISO 17025        | Standardless info only |         |
| 21b      | 0,976    | 0,010 | -3,234  | 0,983   | 0,969   | ISO 17025        | Standardless info only |         |
| 22       | 1,222    | 0,005 | 0,587   | 1,218   | 1,225   | ISO 17025        | XRF (fusion)           |         |
| 23       | 1,161    | 0,009 | -0,347  | 1,168   | 1,155   | ISO 17025        | XRF (fusion)           |         |
| 24       | 1,120    | 0,000 | -0,993  | 1,120   | 1,120   | ISO 17025        | XRF (fusion)           |         |
| 25       | 1,190    | 0,002 | 0,089   | 1,188   | 1,191   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

**Sample:** FLX-CRM 131      **Reprod. s.d.:** 0,003 % TM  
**Measurand:** ZNO      **Repeat. s.d:** 0,000 % TM  
**Mean ± U(Mean):** 0,007 ± 0,003 % TM      **Statistical method:** Q/Hampel  
**No. of laboratories:** 4      **Range of tolerance:** 0,001 - 0,012 % TM (|z-score| <= 2,000)  
**Assigned value:** 0,007 % TM (Empirical value)      **Target s.d.:** 0,003 % TM (Empirical value)



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES                |         |
| 13       | 0,006    | 0,000 | -0,315  | 0,006   | 0,006   | no accreditation | XRF (fusion)           |         |
| 19       | 0,005    | 0,001 | -0,856  | 0,004   | 0,005   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,005    | 0,000 | -0,676  | 0,005   | 0,005   | ISO 17025        | Standardless info only |         |
| 21b      | 0,006    | 0,001 | -0,315  | 0,007   | 0,005   | ISO 17025        | Standardless info only |         |

*RV130 (Cement)*

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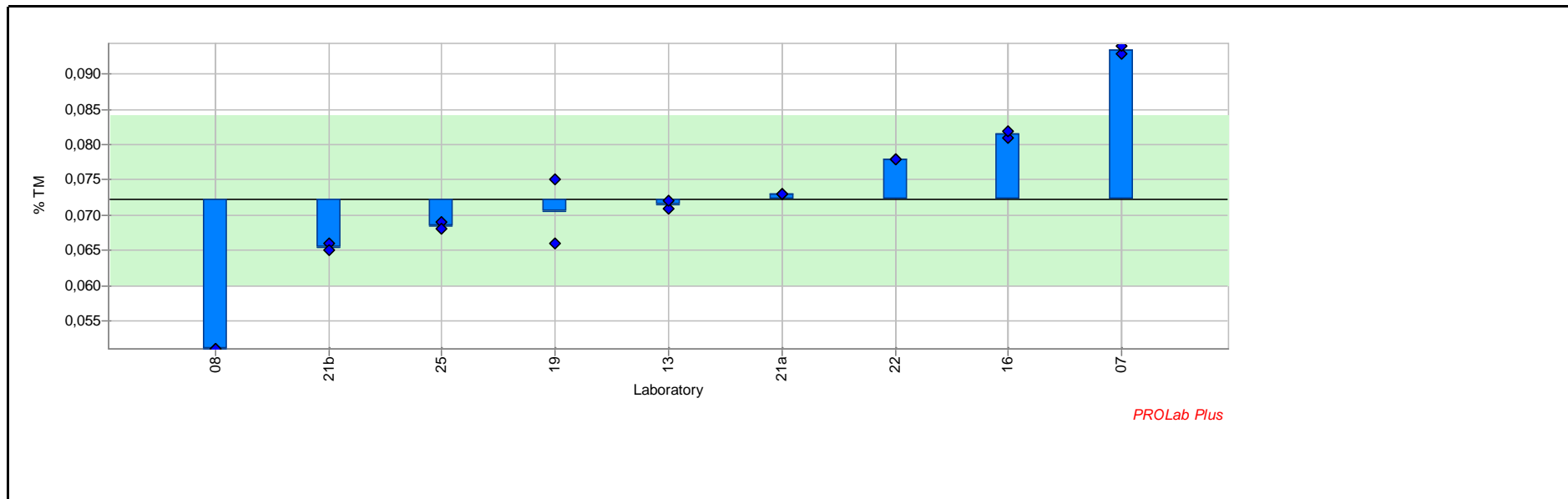
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 22       | 0,008    | 0,000 | 0,406   | 0,008   | 0,008   | ISO 17025        | XRF (fusion)      |         |
| 25       | 0,009    | 0,000 | 0,766   | 0,009   | 0,009   | no accreditation | XRF (fusion)      |         |

RV130 (Cement)

## Summary results



|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                  | <b>Reprod. s.d.</b>        | <b>0,015 % TM</b>                                 |
| <b>Measurand:</b>           | <b>SRO</b>                          | <b>Repeat. s.d</b>         | <b>0,002 % TM</b>                                 |
| <b>Mean ± U(Mean):</b>      | <b>0,072 ± 0,012 % TM</b>           | <b>Statistical method</b>  | <b>Q/Hampel</b>                                   |
| <b>No. of laboratories:</b> | <b>6</b>                            | <b>Range of tolerance:</b> | <b>0,043 - 0,102 % TM ( z-score  &lt;= 2,000)</b> |
| <b>Assigned value</b>       | <b>0,072 % TM (Empirical value)</b> | <b>Target s.d.</b>         | <b>0,015 % TM (Empirical value)</b>               |



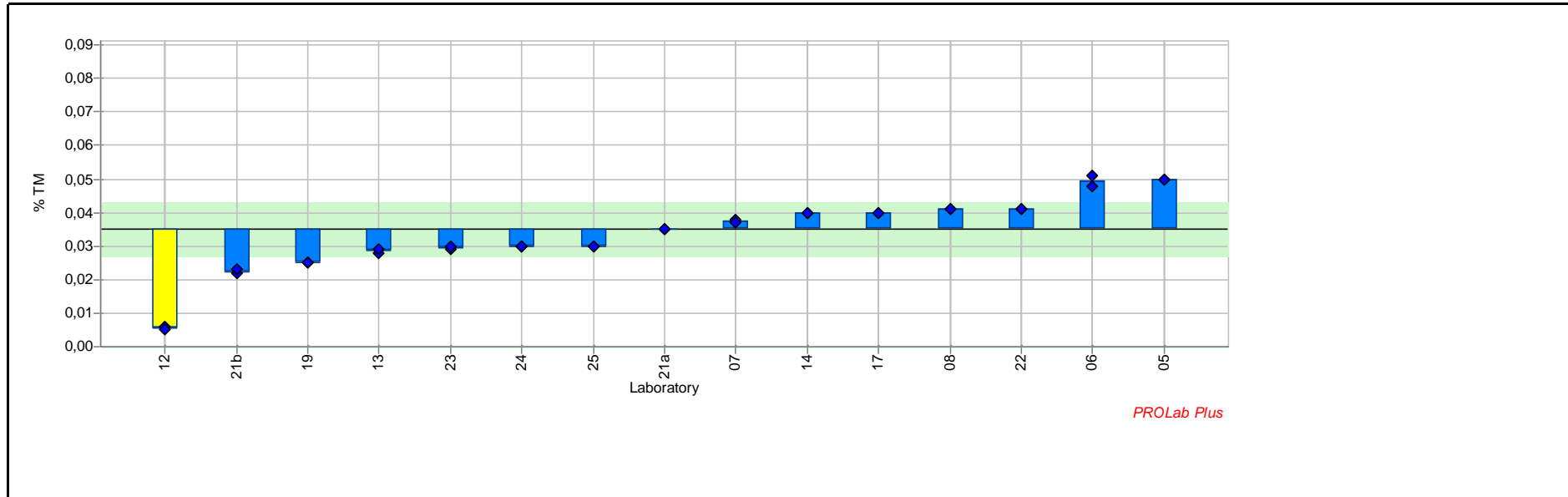
| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 07       | 0,093    | 0,001 | 1,442   | 0,093   | 0,094   | no accreditation | XRF (fusion)      |         |
| 08       | 0,051    | 0,000 | -1,431  | 0,051   | 0,051   | ISO 17025        | XRF (fusion)      |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES                |         |
| 13       | 0,071    | 0,001 | -0,045  | 0,071   | 0,072   | no accreditation | XRF (fusion)           |         |
| 16       | 0,082    | 0,001 | 0,631   | 0,081   | 0,082   | no accreditation | Standardless info only |         |
| 19       | 0,071    | 0,006 | -0,113  | 0,075   | 0,066   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,073    | 0,000 | 0,056   | 0,073   | 0,073   | ISO 17025        | Standardless info only |         |
| 21b      | 0,066    | 0,001 | -0,451  | 0,066   | 0,065   | ISO 17025        | Standardless info only |         |
| 22       | 0,078    | 0,000 | 0,394   | 0,078   | 0,078   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,069    | 0,001 | -0,248  | 0,069   | 0,068   | no accreditation | XRF (fusion)           |         |

RV130 (Cement)

|                             |                                     |                            |   |
|-----------------------------|-------------------------------------|----------------------------|---|
| <b>Sample:</b>              | <b>FLX-CRM 131</b>                  | <b>Reprod. s.d.:</b>       | <b>0,014 % TM</b>                             |
| <b>Measurand:</b>           | <b>MN2O3</b>                        | <b>Repeat. s.d.:</b>       | <b>0,001 % TM</b>                             |
| <b>Mean ± U(Mean):</b>      | <b>0,035 ± 0,008 % TM</b>           | <b>Statistical method:</b> | <b>Q/Hampel</b>                               |
| <b>No. of laboratories:</b> | <b>13</b>                           | <b>Range of tolerance:</b> | <b>0,007 - 0,063 % TM ( z-score  ≤ 2,000)</b> |
| <b>Assigned value</b>       | <b>0,035 % TM (Empirical value)</b> | <b>Target s.d.:</b>        | <b>0,014 % TM (Empirical value)</b>           |



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 05       | 0,050    | 0,000 | 1,062   | 0,050   | 0,050   | no accreditation | XRF (fusion)      |         |
| 06       | 0,050    | 0,002 | 1,027   | 0,048   | 0,051   | no accreditation | XRF (fusion)      |         |
| 07       | 0,037    | 0,001 | 0,172   | 0,038   | 0,037   | no accreditation | XRF (fusion)      |         |
| 08       | 0,041    | 0,000 | 0,422   | 0,041   | 0,041   | ISO 17025        | XRF (fusion)      |         |
| 09       |          |       |         | <0,100  | <0,100  | ISO 17025        | ICP-OES           |         |

**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|---------|
| 12       | 0,005    | 0,001 | -2,106  | 0,006   | 0,005   | no accreditation | XRF (fusion)           |         |
| 13       | 0,029    | 0,001 | -0,468  | 0,028   | 0,029   | no accreditation | XRF (fusion)           |         |
| 14       | 0,040    | 0,000 | 0,350   | 0,040   | 0,040   | no accreditation | XRF (fusion)           |         |
| 17       | 0,040    | 0,000 | 0,350   | 0,040   | 0,040   | no accreditation | XRF (fusion)           |         |
| 19       | 0,025    | 0,000 | -0,718  | 0,025   | 0,025   | ISO 17025        | XRF (fusion)           |         |
| 21a      | 0,035    | 0,000 | -0,006  | 0,035   | 0,035   | ISO 17025        | Standardless info only |         |
| 21b      | 0,022    | 0,001 | -0,896  | 0,022   | 0,023   | ISO 17025        | Standardless info only |         |
| 22       | 0,041    | 0,000 | 0,422   | 0,041   | 0,041   | ISO 17025        | XRF (fusion)           |         |
| 23       | 0,029    | 0,001 | -0,397  | 0,029   | 0,030   | ISO 17025        | XRF (fusion)           |         |
| 24       | 0,030    | 0,000 | -0,362  | 0,030   | 0,030   | ISO 17025        | XRF (fusion)           |         |
| 25       | 0,030    | 0,000 | -0,362  | 0,030   | 0,030   | no accreditation | XRF (fusion)           |         |



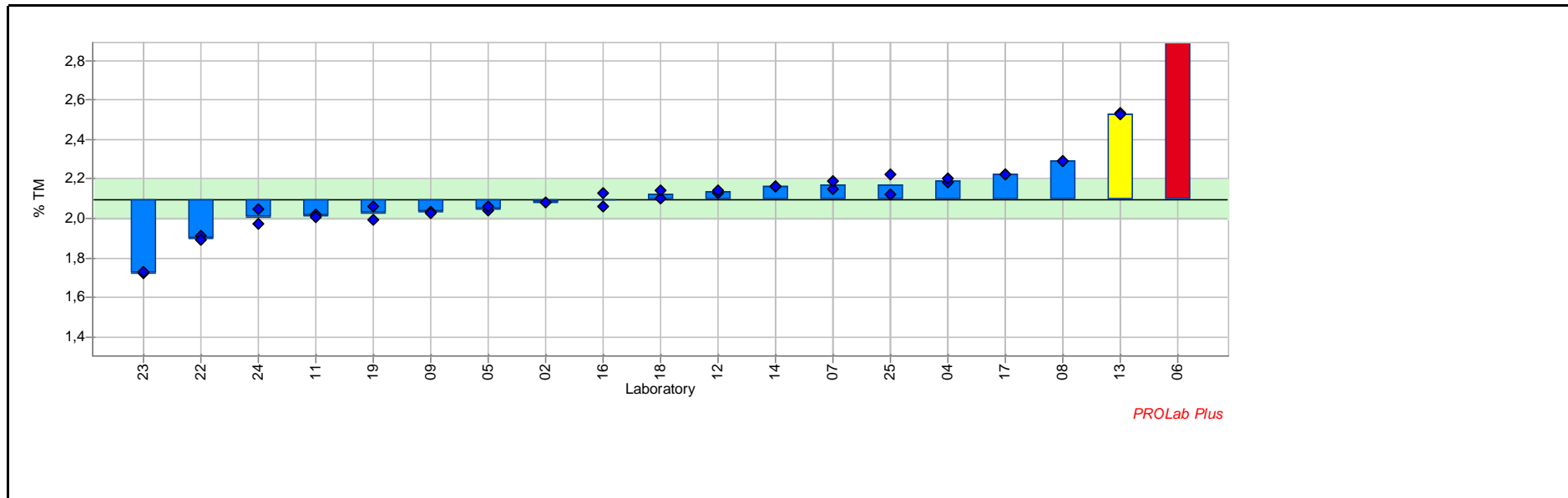


**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method      | Comment     |
|----------|----------|-------|---------|---------|---------|------------------|------------------------|-------------|
| 08       | 18,627   | 0,000 | 0,191   | 18,627  | 18,627  | ISO 17025        | other                  | Gravimetric |
| 09       | 19,810   | 0,127 | 1,522   | 19,900  | 19,720  | ISO 17025        | combustion             |             |
| 11       | 17,544   | 0,128 | -1,028  | 17,453  | 17,634  | no accreditation | XRF (fusion)           |             |
| 12       | 15,900   |       | -2,877  |         | 15,900  | no accreditation | combustion             |             |
| 13       | 12,328   | 0,035 | -6,896  | 12,303  | 12,353  | no accreditation | XRF (fusion)           |             |
| 14       | 18,325   | 0,049 | -0,149  | 18,290  | 18,360  | no accreditation | XRF (fusion)           |             |
| 16       | 6,050    | 0,113 | -13,960 | 5,970   | 6,130   | no accreditation | Standardless info only |             |
| 17       | 18,295   | 0,078 | -0,182  | 18,350  | 18,240  | no accreditation | XRF (fusion)           |             |
| 18       | 14,920   | 0,297 | -3,980  | 15,130  | 14,710  | ISO 17025        | XRF (fusion)           |             |
| 19       | 18,441   | 0,282 | -0,017  | 18,242  | 18,641  | ISO 17025        | XRF (fusion)           |             |
| 21a      | 13,995   | 0,078 | -5,020  | 14,050  | 13,940  | ISO 17025        | Standardless info only |             |
| 21b      | 14,965   | 0,205 | -3,929  | 14,820  | 15,110  | ISO 17025        | Standardless info only |             |
| 22       | 19,290   | 0,253 | 0,937   | 19,469  | 19,111  | ISO 17025        | combustion             |             |
| 23       | 18,617   | 0,045 | 0,180   | 18,585  | 18,649  | ISO 17025        | XRF (fusion)           |             |
| 24       | 17,870   | 0,113 | -0,660  | 17,950  | 17,790  | ISO 17025        | XRF (fusion)           |             |
| 25       | 18,770   | 0,042 | 0,352   | 18,800  | 18,740  | no accreditation | XRF (fusion)           |             |

RV130 (Cement)

**Sample:** FLX-CRM 131                      **Reprod. s.d.** 0,198 % TM  
**Measurand:** Loss on Ignition              **Repeat. s.d** 0,016 % TM  
**Mean ± U(Mean):** 2,098 ± 0,099 % TM      **Statistical method** Q/Hampel  
**No. of laboratories:** 16                      **Range of tolerance:** 1,701 - 2,495 % TM (|z-score| <= 2,000)  
**Assigned value** 2,098 % TM (Empirical value)      **Target s.d.** 0,198 % TM (Empirical value)



| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 02       | 2,080    |       | -0,090  | 2,080   |         | no accreditation | 1h@950°C          |         |
| 04       | 2,190    | 0,014 | 0,464   | 2,180   | 2,200   | no accreditation | 1h@950°C          |         |
| 05       | 2,050    | 0,014 | -0,241  | 2,040   | 2,060   | no accreditation | 1h@950°C          |         |
| 06       | 4,710    | 0,000 | 13,164  | 4,710   | 4,710   | no accreditation | 1h@950°C          |         |
| 07       | 2,170    | 0,028 | 0,364   | 2,150   | 2,190   | no accreditation | 1h@950°C          |         |

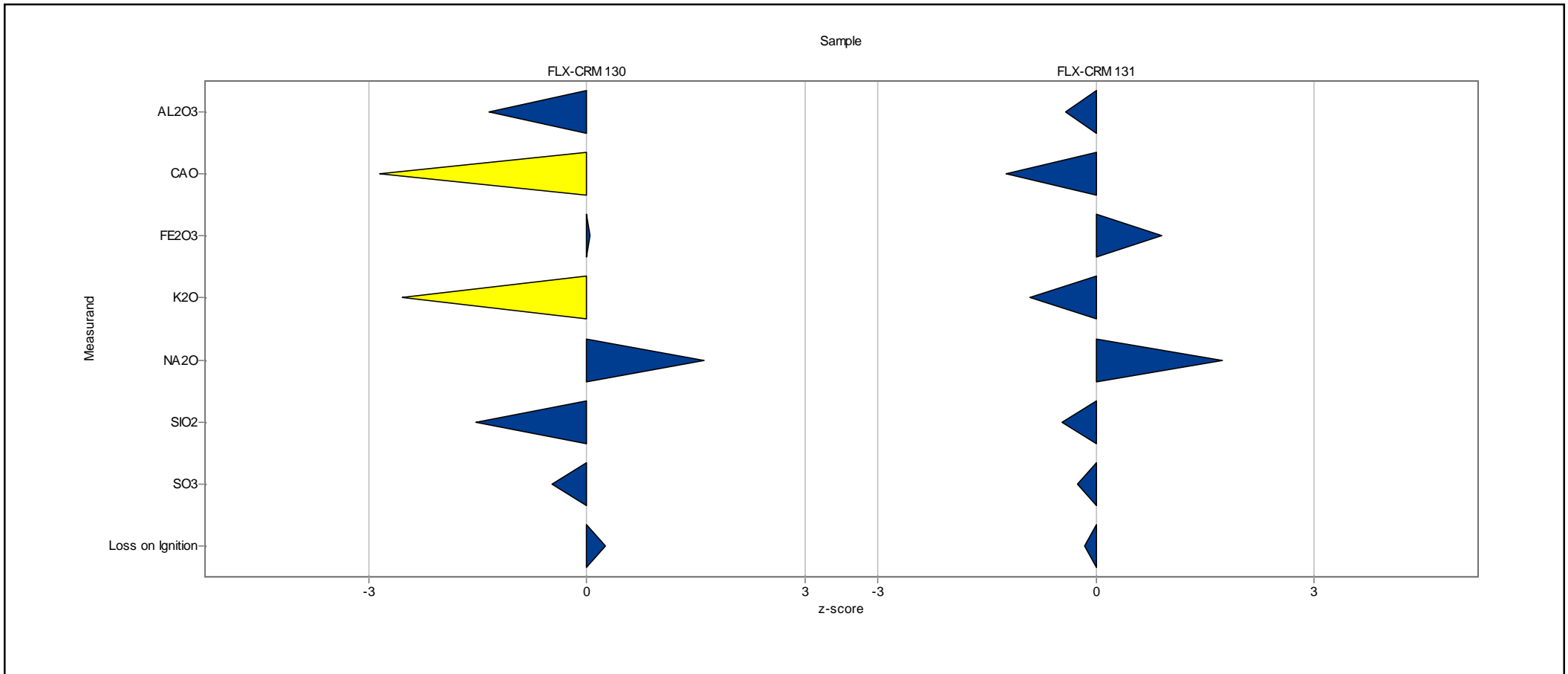
**RV130 (Cement)**

| Lab code | Lab mean | s.d.  | z-score | Conc. 1 | Conc. 2 | Accreditation    | Analytical method | Comment |
|----------|----------|-------|---------|---------|---------|------------------|-------------------|---------|
| 08       | 2,290    | 0,000 | 0,968   | 2,290   | 2,290   | ISO 17025        | 1h@950°C          |         |
| 09       | 2,030    | 0,005 | -0,339  | 2,034   | 2,027   | ISO 17025        | 1h@950°C          |         |
| 11       | 2,015    | 0,007 | -0,417  | 2,020   | 2,010   | no accreditation | 1h@950°C          |         |
| 12       | 2,135    | 0,007 | 0,187   | 2,130   | 2,140   | no accreditation | 1h@950°C          |         |
| 13       | 2,529    | 0,005 | 2,170   | 2,532   | 2,525   | no accreditation | 1h@950°C          |         |
| 14       | 2,160    | 0,000 | 0,313   | 2,160   | 2,160   | no accreditation | 1h@950°C          |         |
| 16       | 2,095    | 0,047 | -0,017  | 2,128   | 2,061   | no accreditation | 1h@950°C          |         |
| 17       | 2,220    | 0,000 | 0,616   | 2,220   | 2,220   | no accreditation | 1h@950°C          |         |
| 18       | 2,120    | 0,028 | 0,112   | 2,100   | 2,140   | ISO 17025        | 1h@950°C          |         |
| 19       | 2,025    | 0,049 | -0,367  | 2,060   | 1,990   | ISO 17025        | 1h@950°C          |         |
| 22       | 1,900    | 0,014 | -0,997  | 1,910   | 1,890   | ISO 17025        | 1h@950°C          |         |
| 23       | 1,726    | 0,002 | -1,876  | 1,724   | 1,727   | ISO 17025        | 1h@950°C          |         |
| 24       | 2,010    | 0,057 | -0,443  | 2,050   | 1,970   | ISO 17025        | 1h@950°C          |         |
| 25       | 2,172    | 0,074 | 0,374   | 2,224   | 2,120   | no accreditation | 1h@950°C          |         |

RV130 (Cement)

## Laboratory chart of z-scores

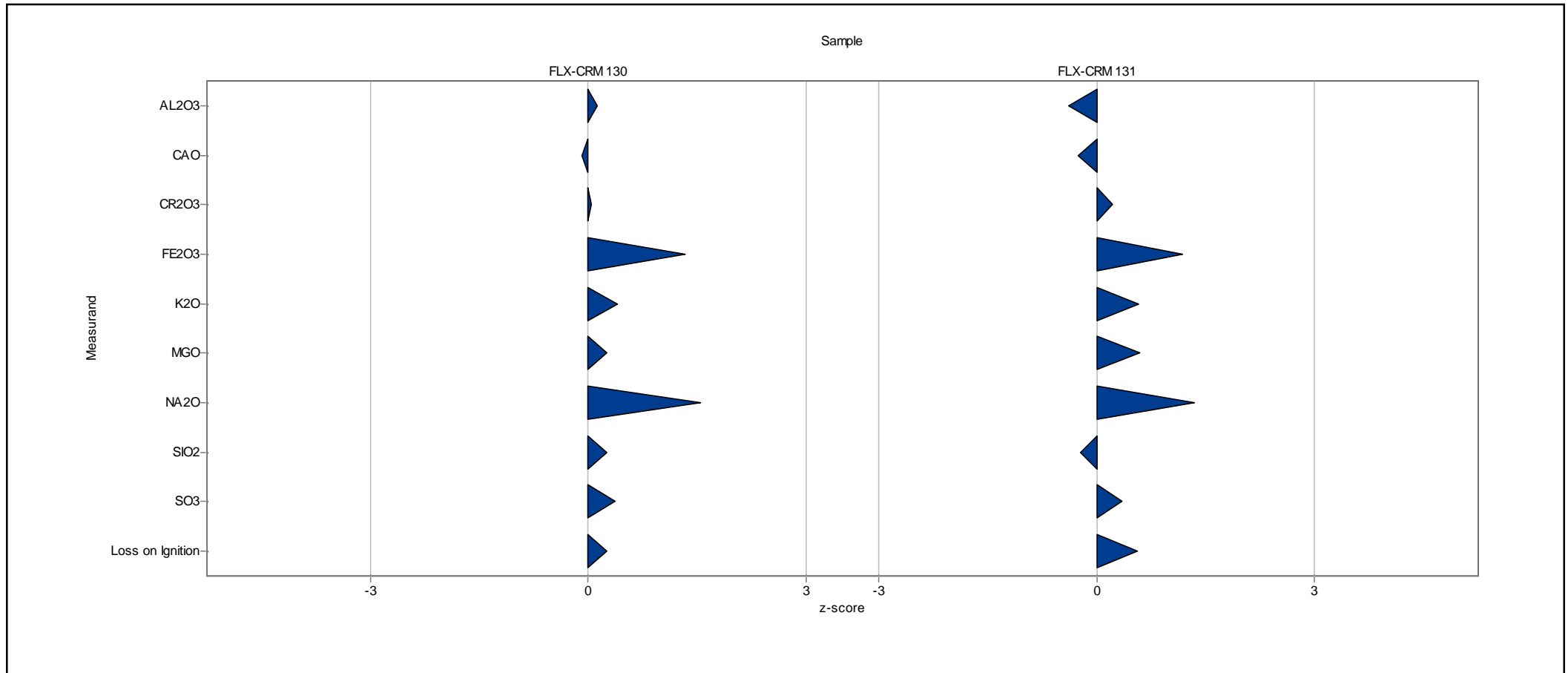
Laboratory: 02



RV130 (Cement)

## Laboratory chart of z-scores

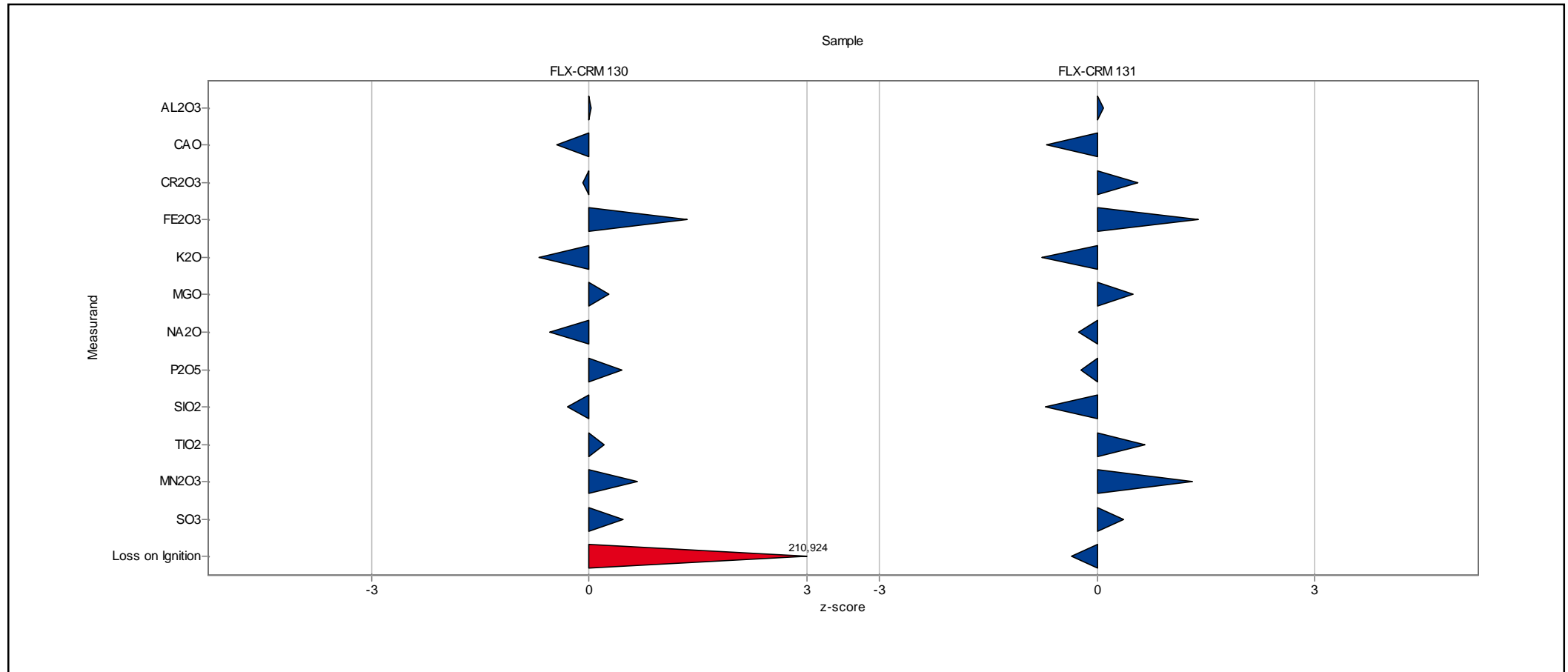
Laboratory: 04



RV130 (Cement)

## Laboratory chart of z-scores

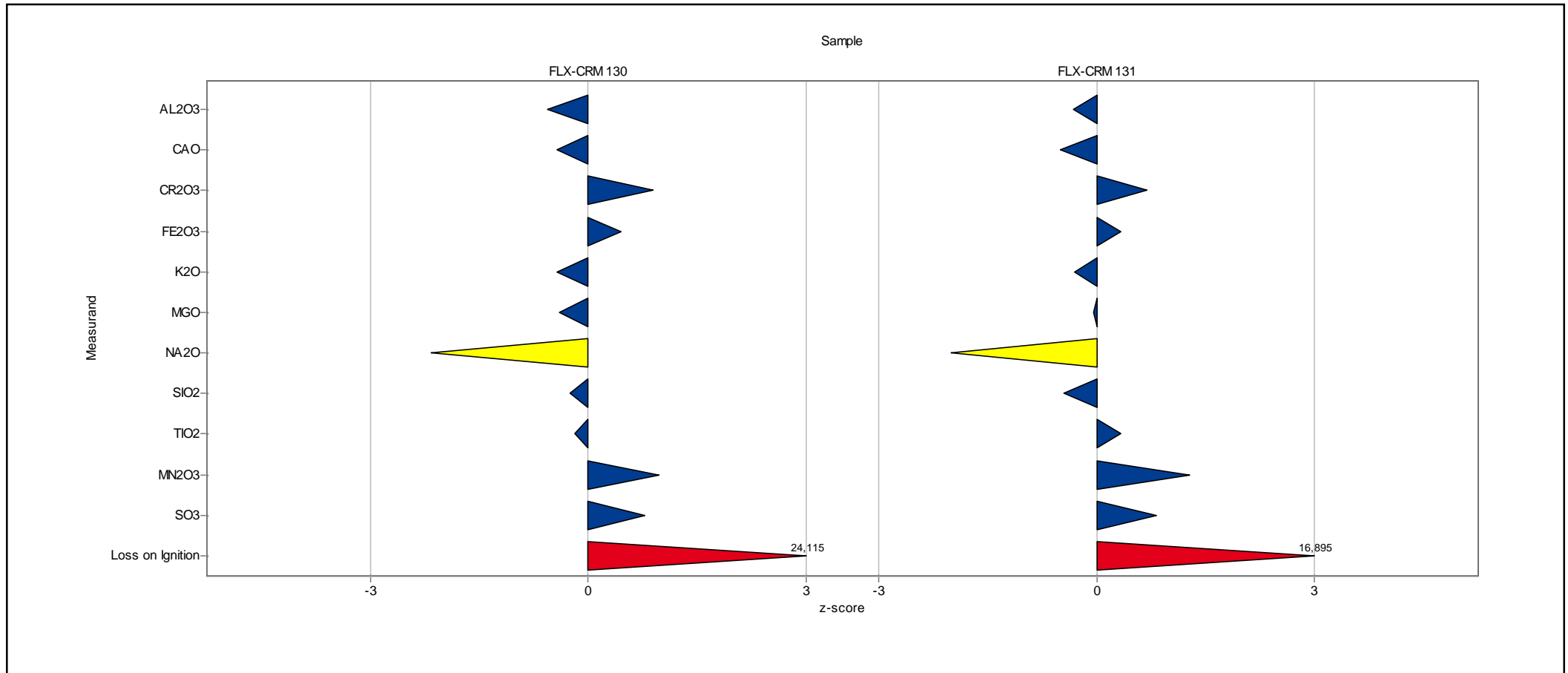
Laboratory: 05



RV130 (Cement)

## Laboratory chart of z-scores

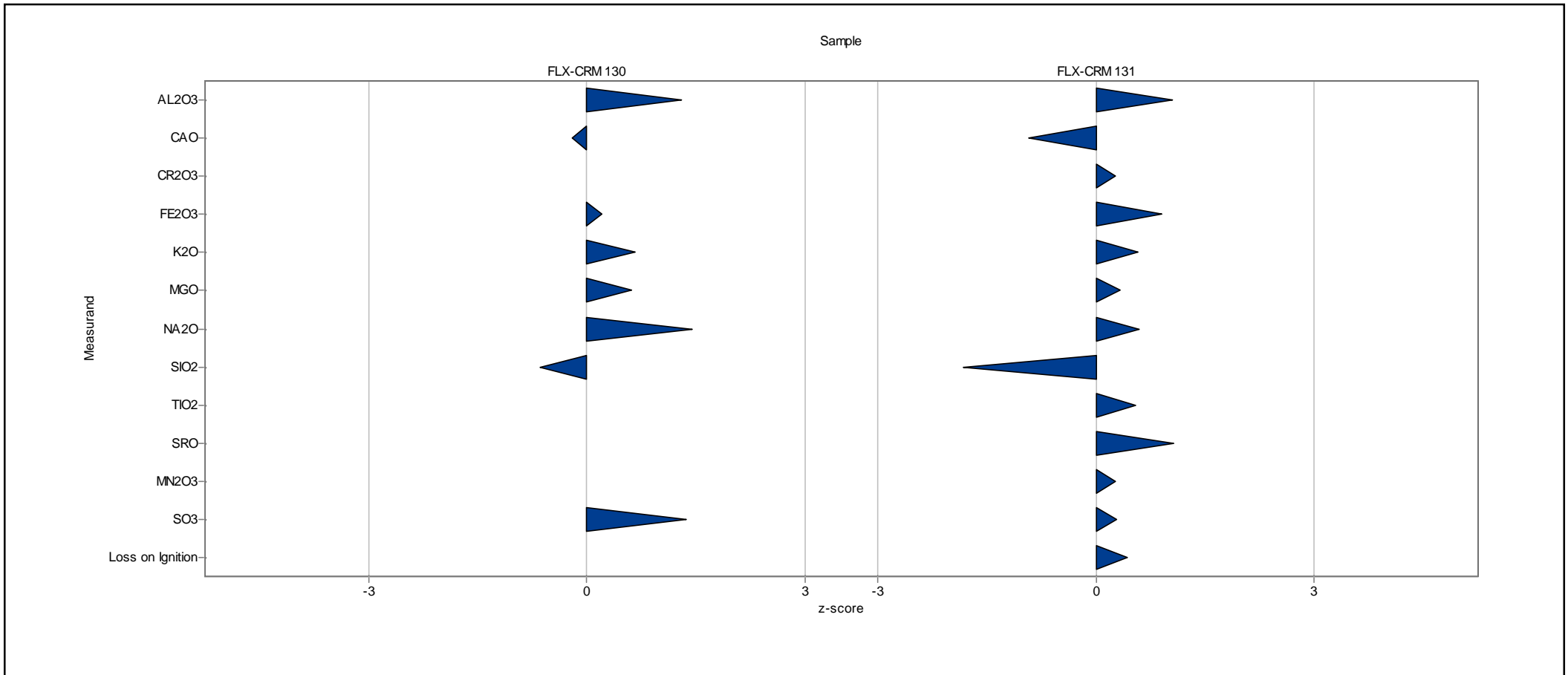
Laboratory: 06



RV130 (Cement)

## Laboratory chart of z-scores

Laboratory: 07

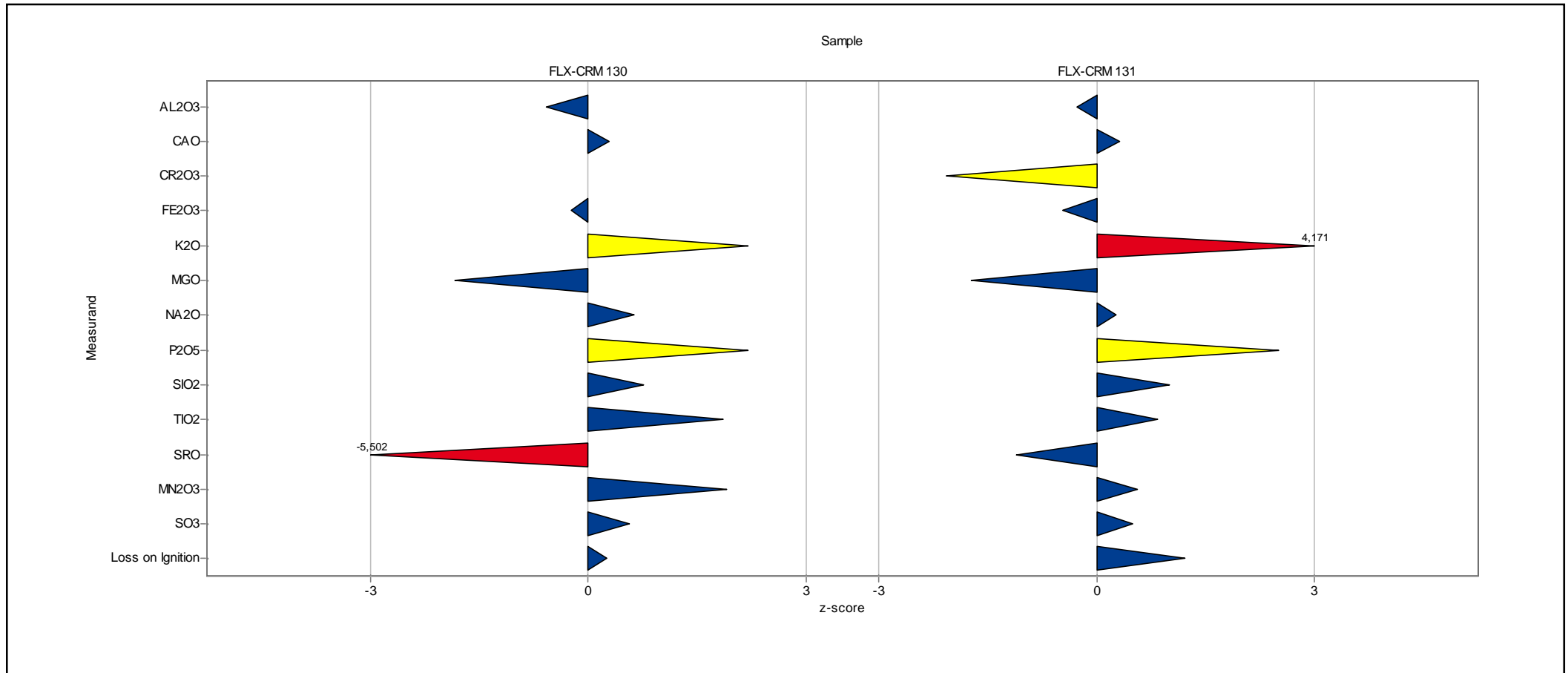




RV130 (Cement)

## Laboratory chart of z-scores

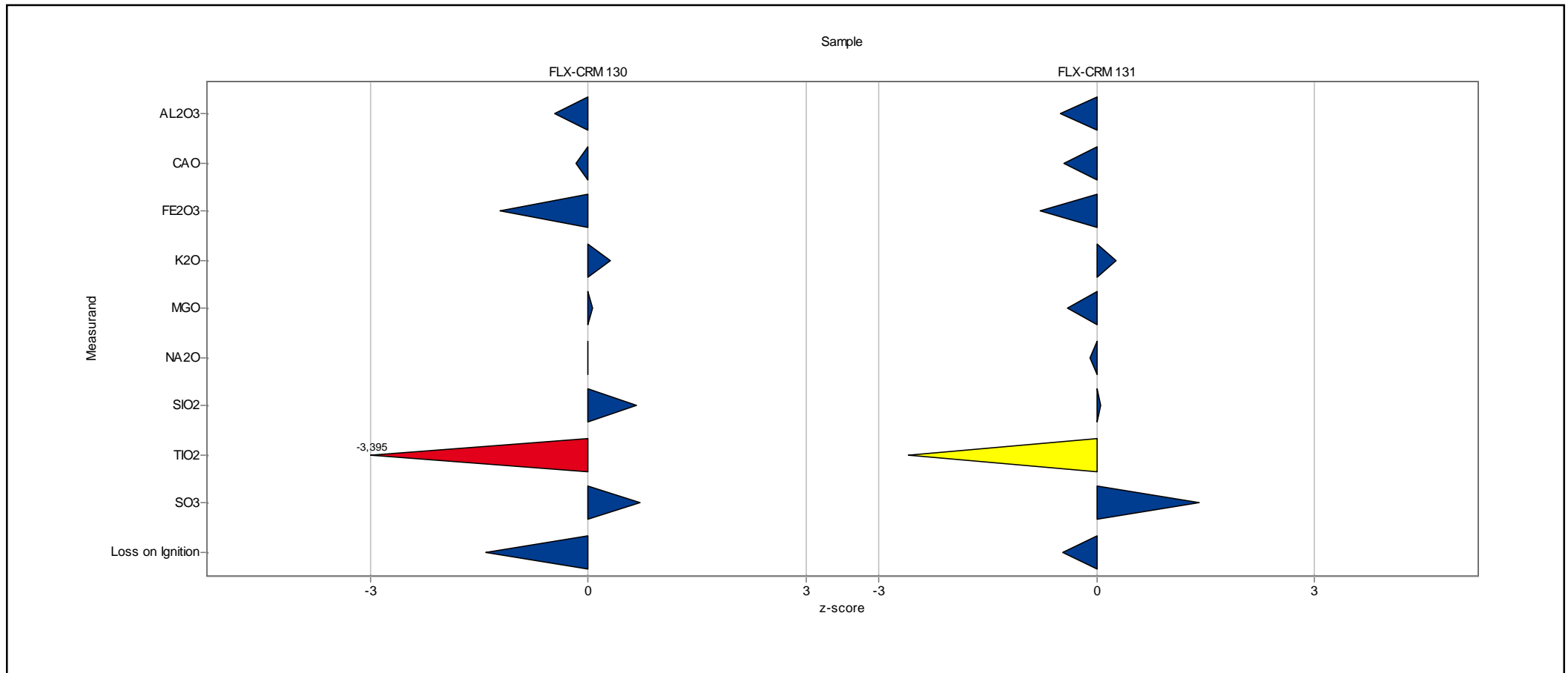
Laboratory: 08



RV130 (Cement)

## Laboratory chart of z-scores

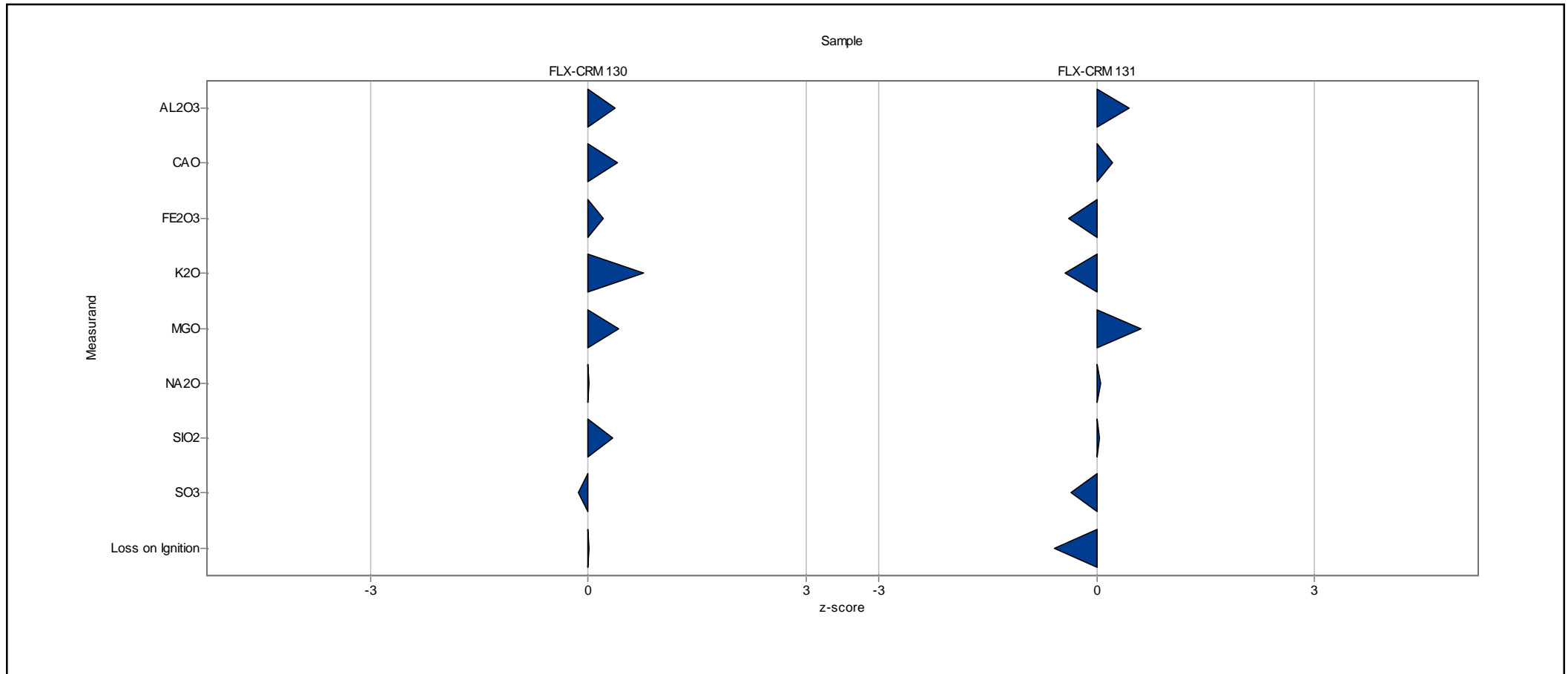
Laboratory: 09



RV130 (Cement)

## Laboratory chart of z-scores

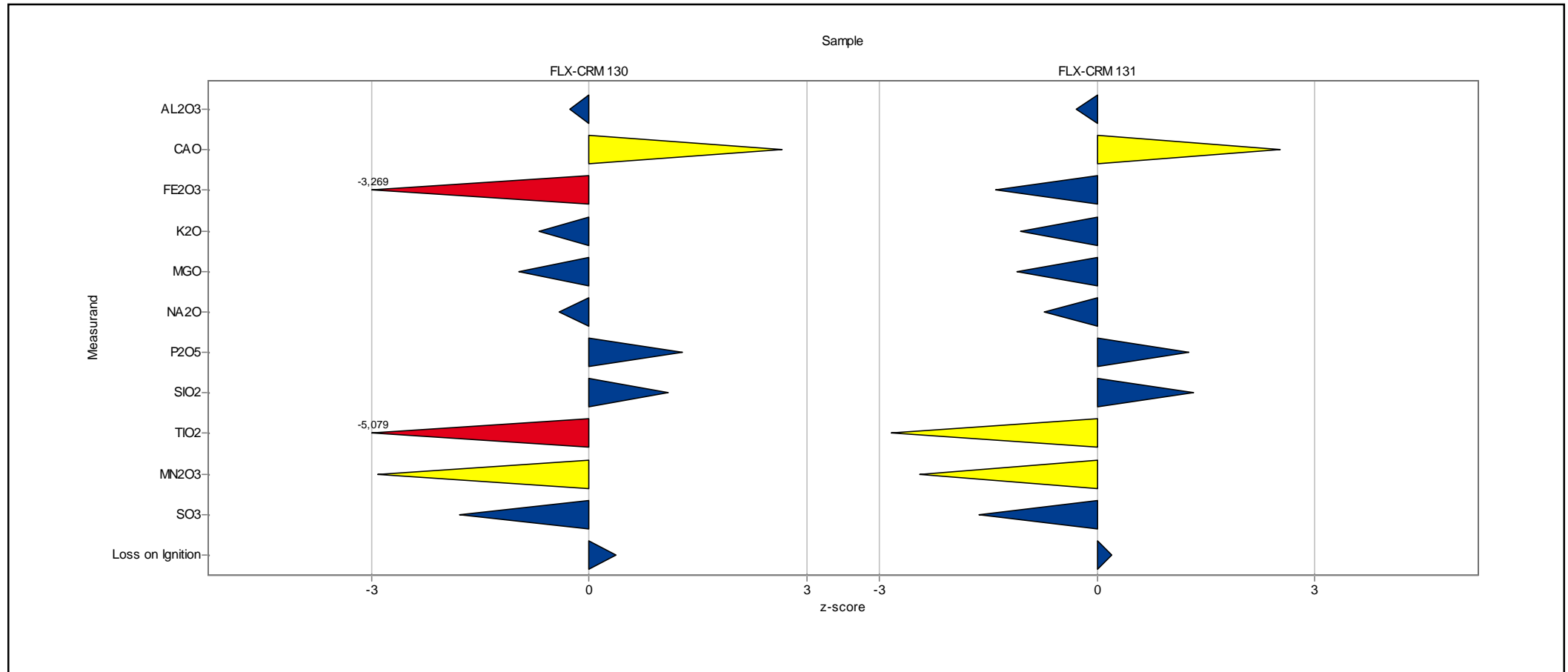
Laboratory: 11



RV130 (Cement)

## Laboratory chart of z-scores

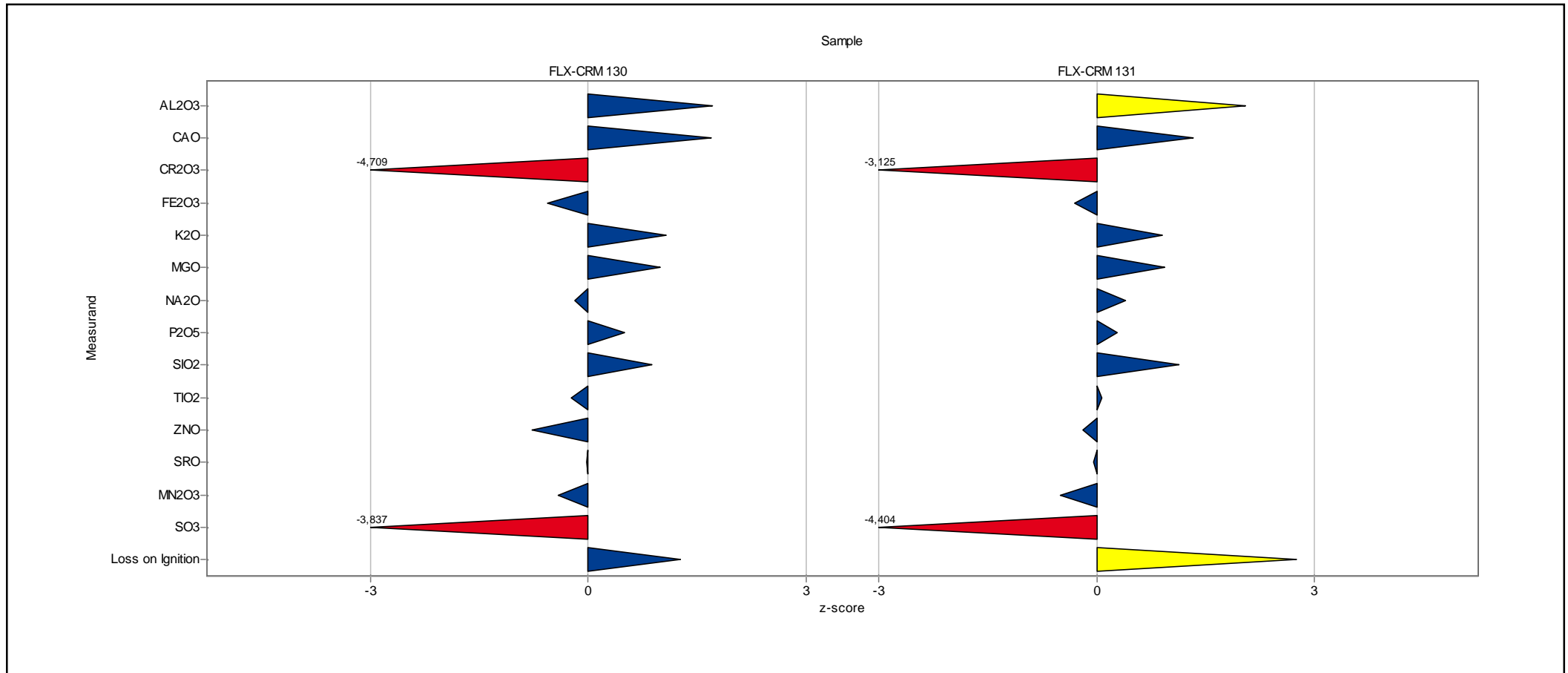
Laboratory: 12



RV130 (Cement)

## Laboratory chart of z-scores

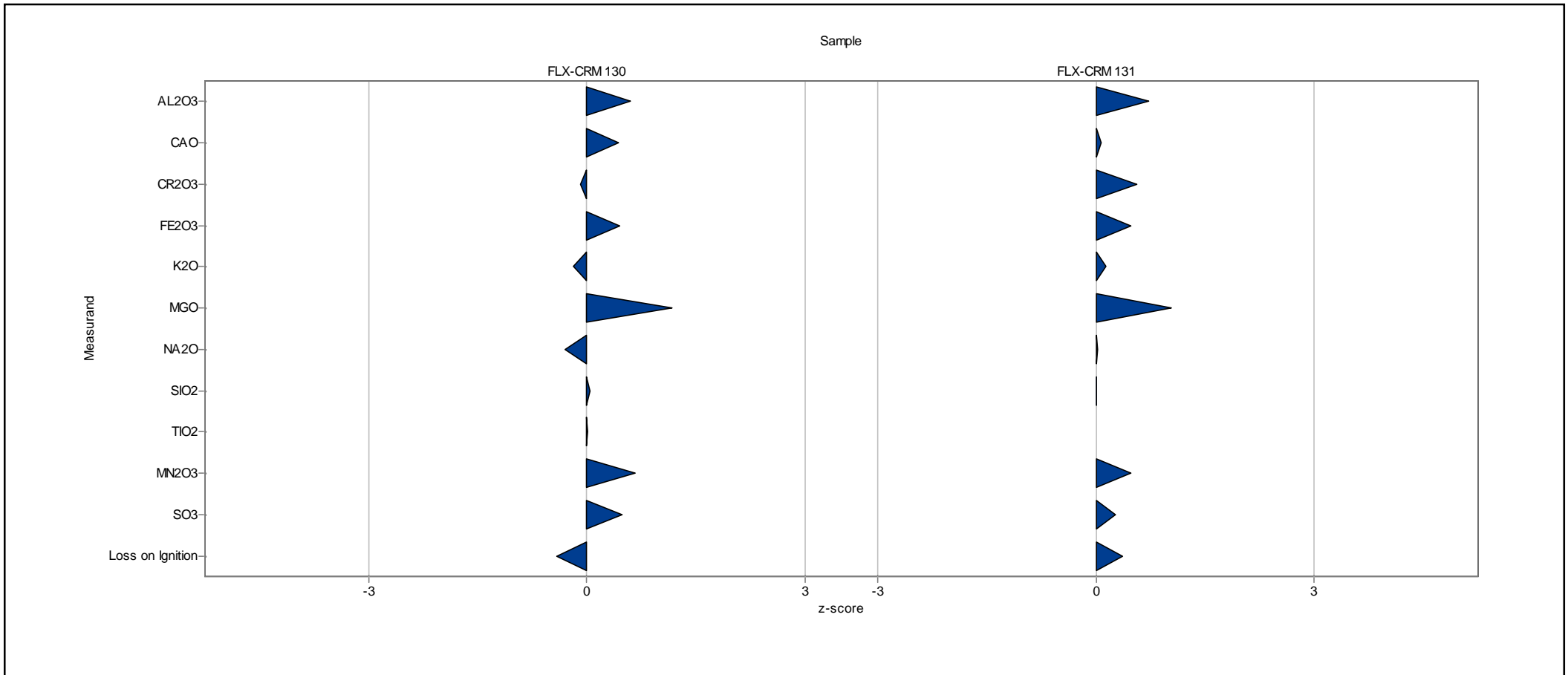
Laboratory: 13



RV130 (Cement)

## Laboratory chart of z-scores

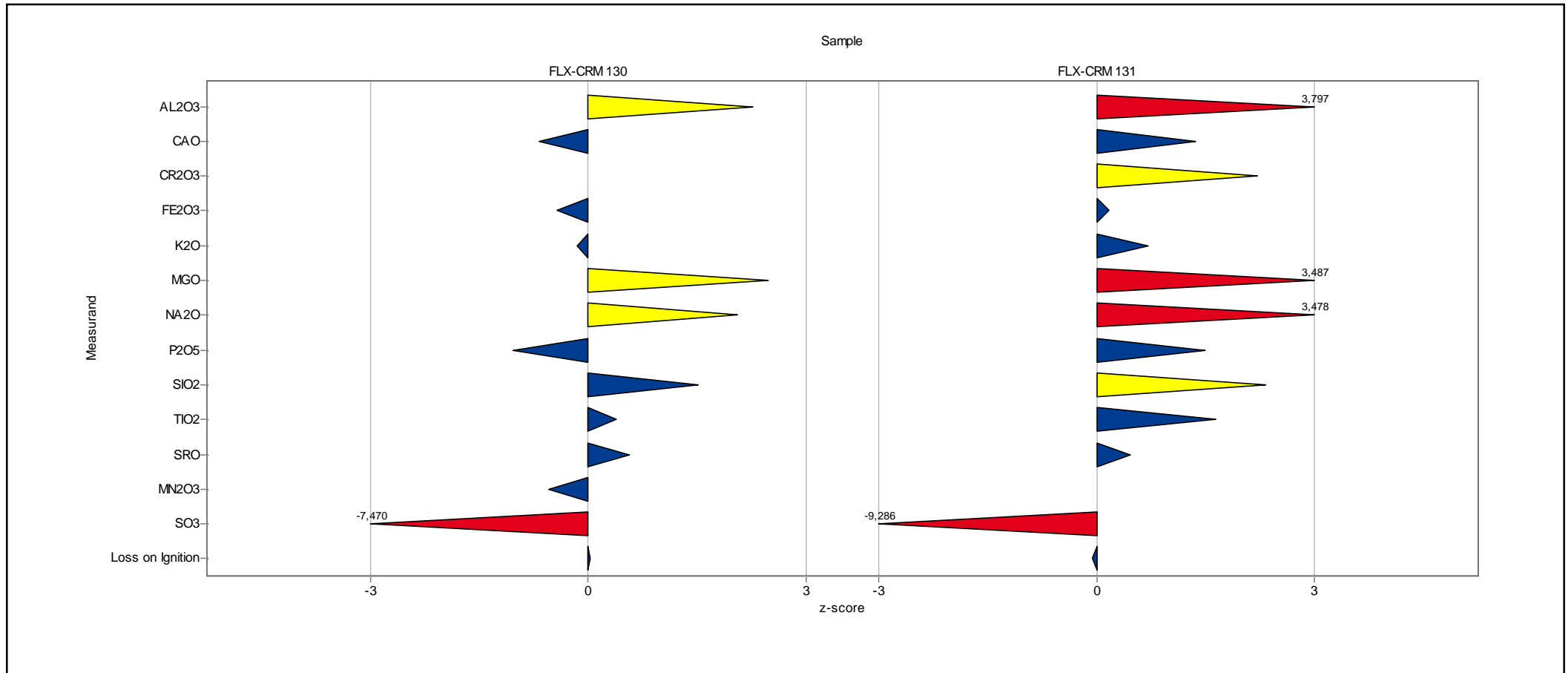
Laboratory: 14



RV130 (Cement)

## Laboratory chart of z-scores

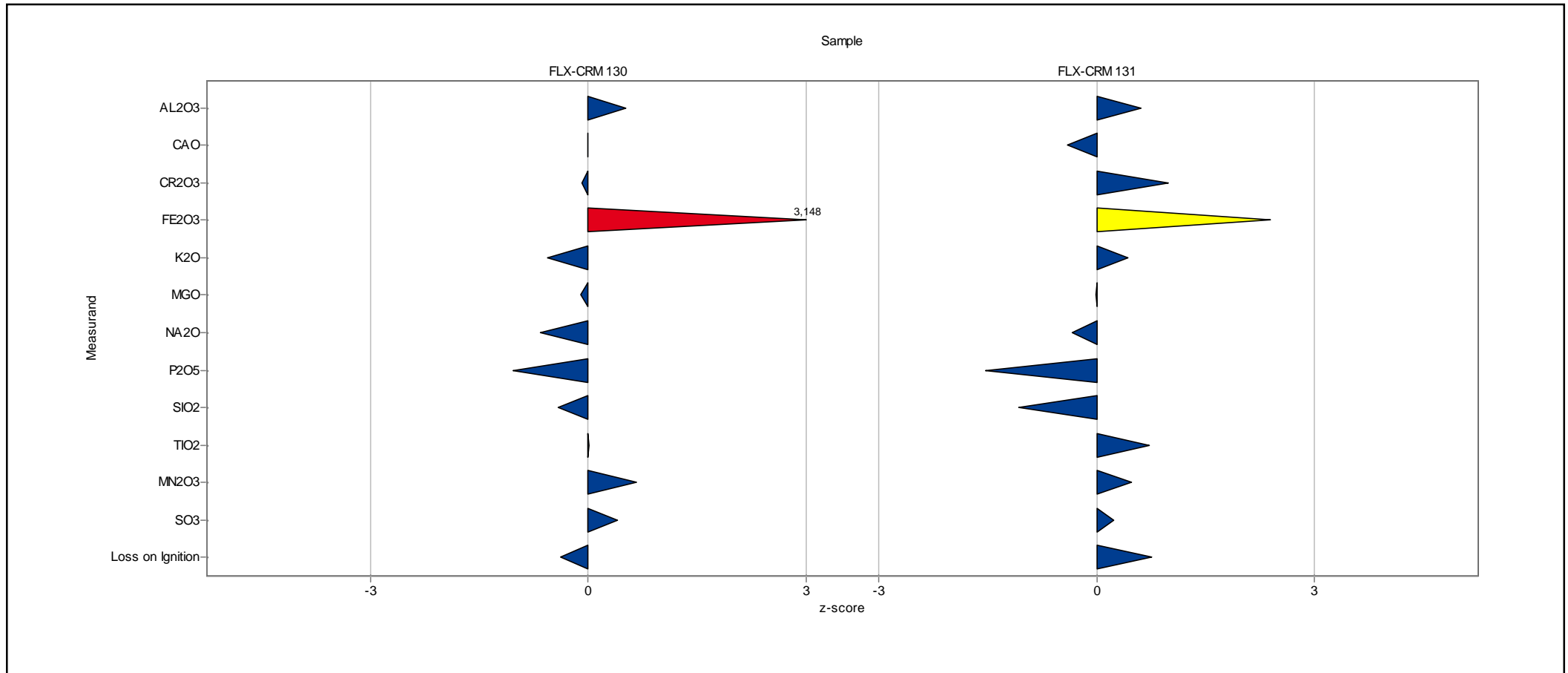
Laboratory: 16



RV130 (Cement)

## Laboratory chart of z-scores

Laboratory: 17

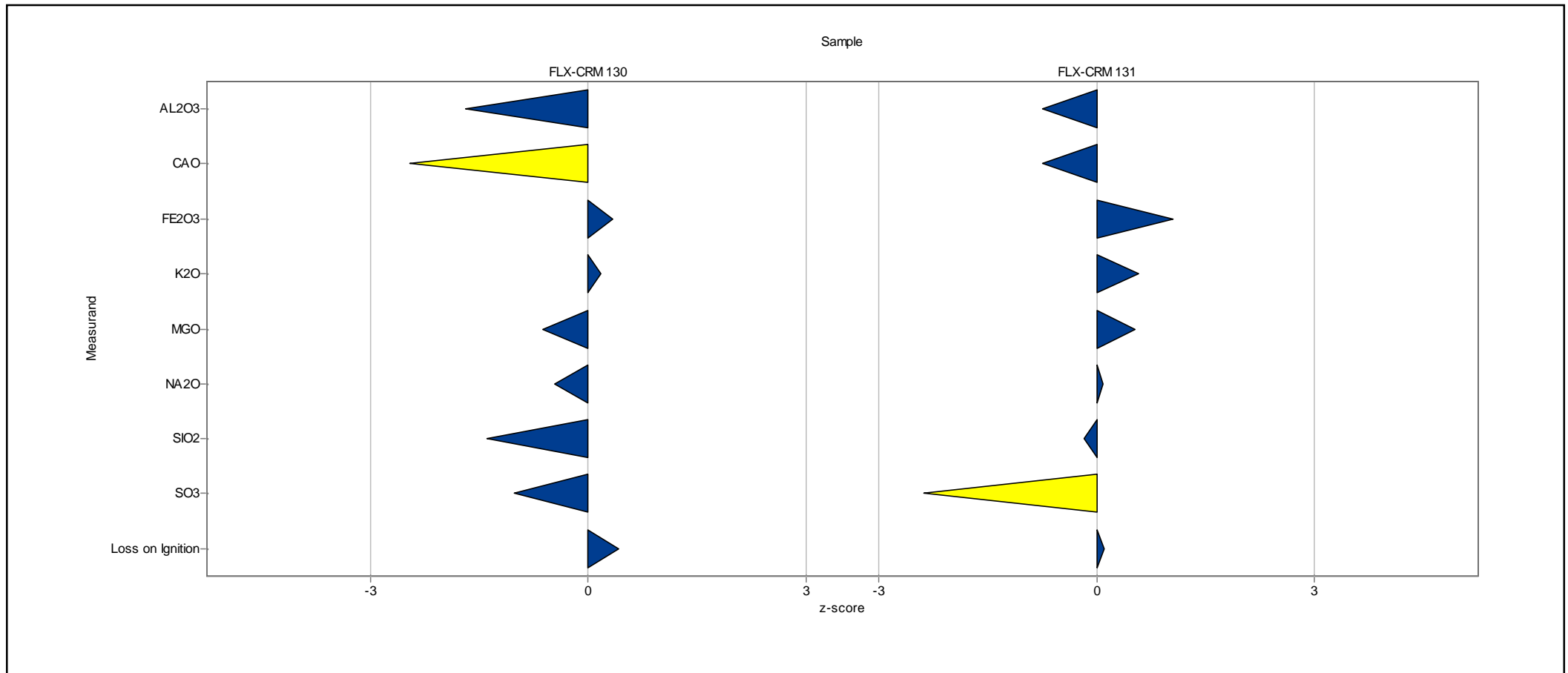




RV130 (Cement)

## Laboratory chart of z-scores

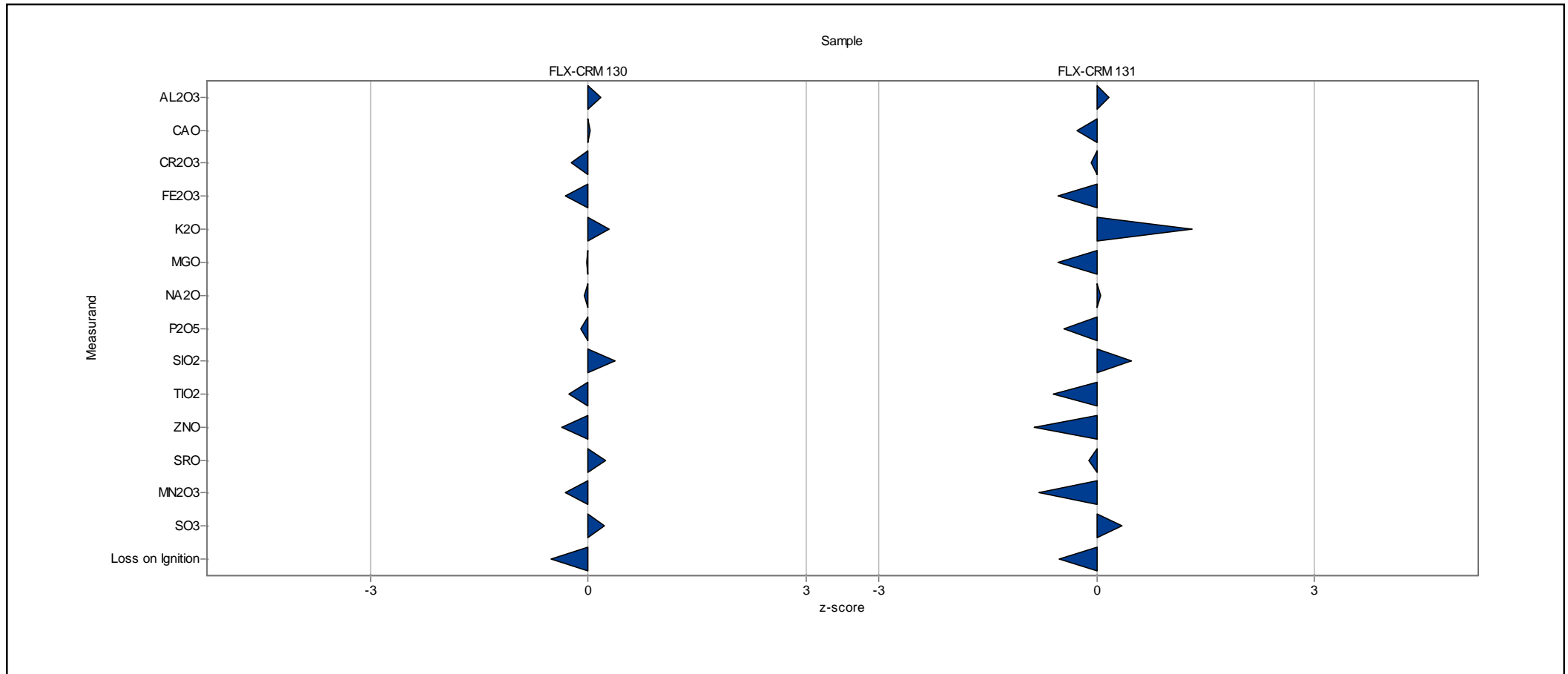
Laboratory: 18



RV130 (Cement)

## Laboratory chart of z-scores

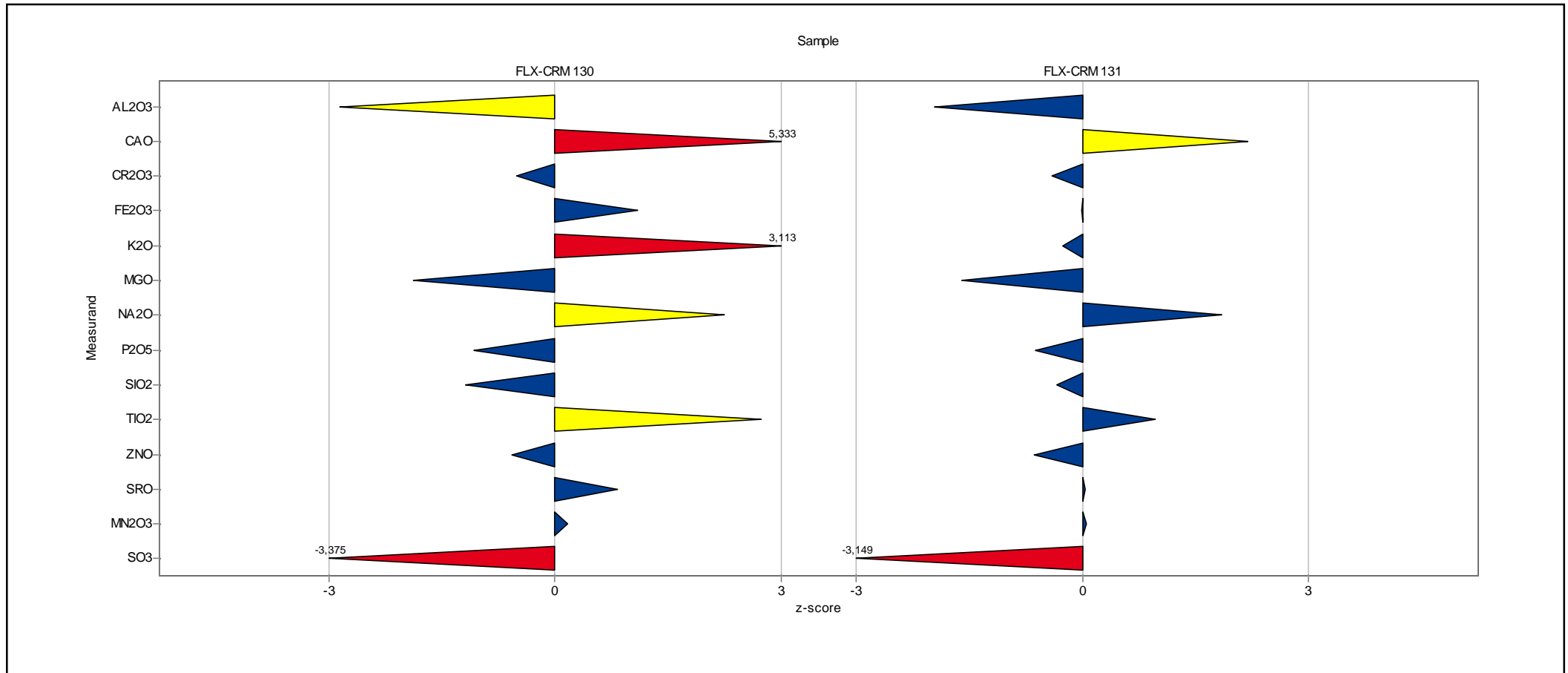
Laboratory: 19



RV130 (Cement)

## Laboratory chart of z-score

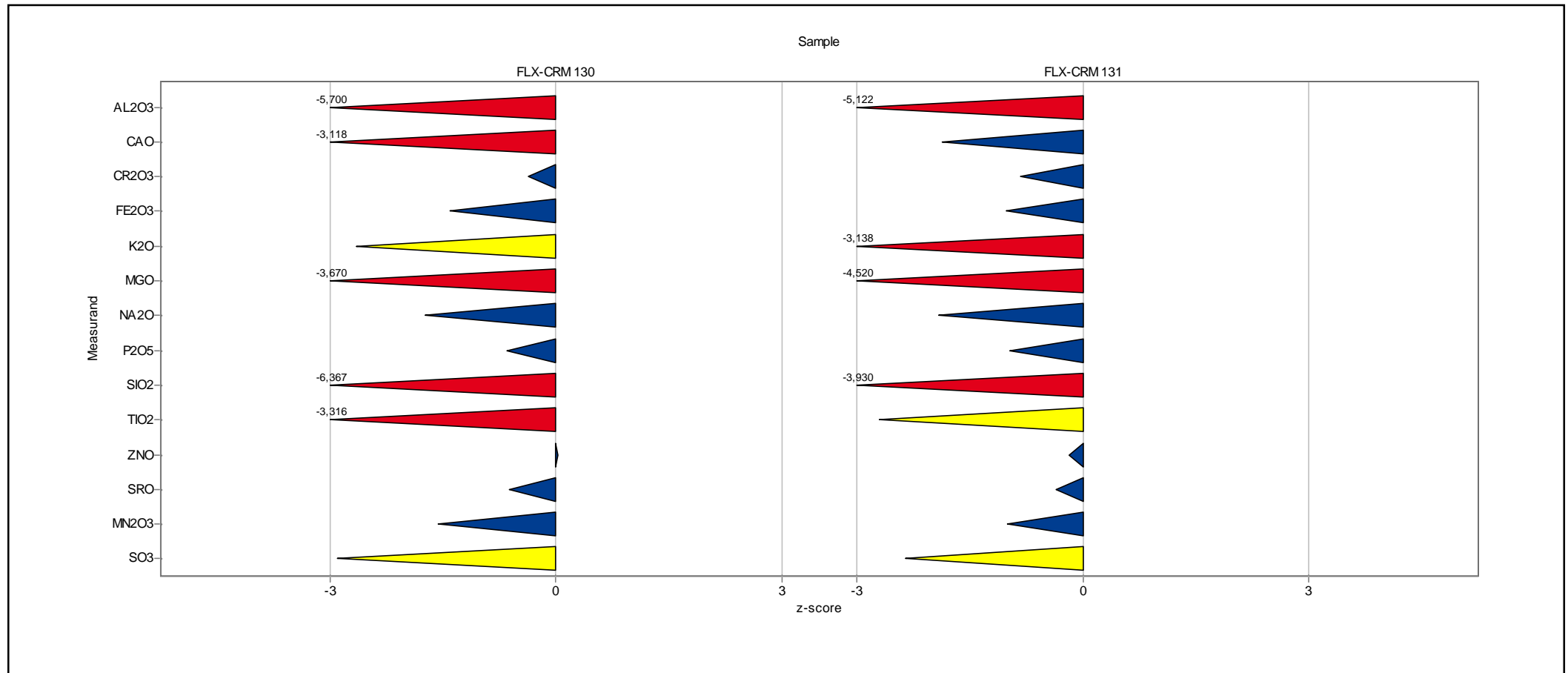
Laboratory: 21a



RV130 (Cement)

## Laboratory chart of z-scores

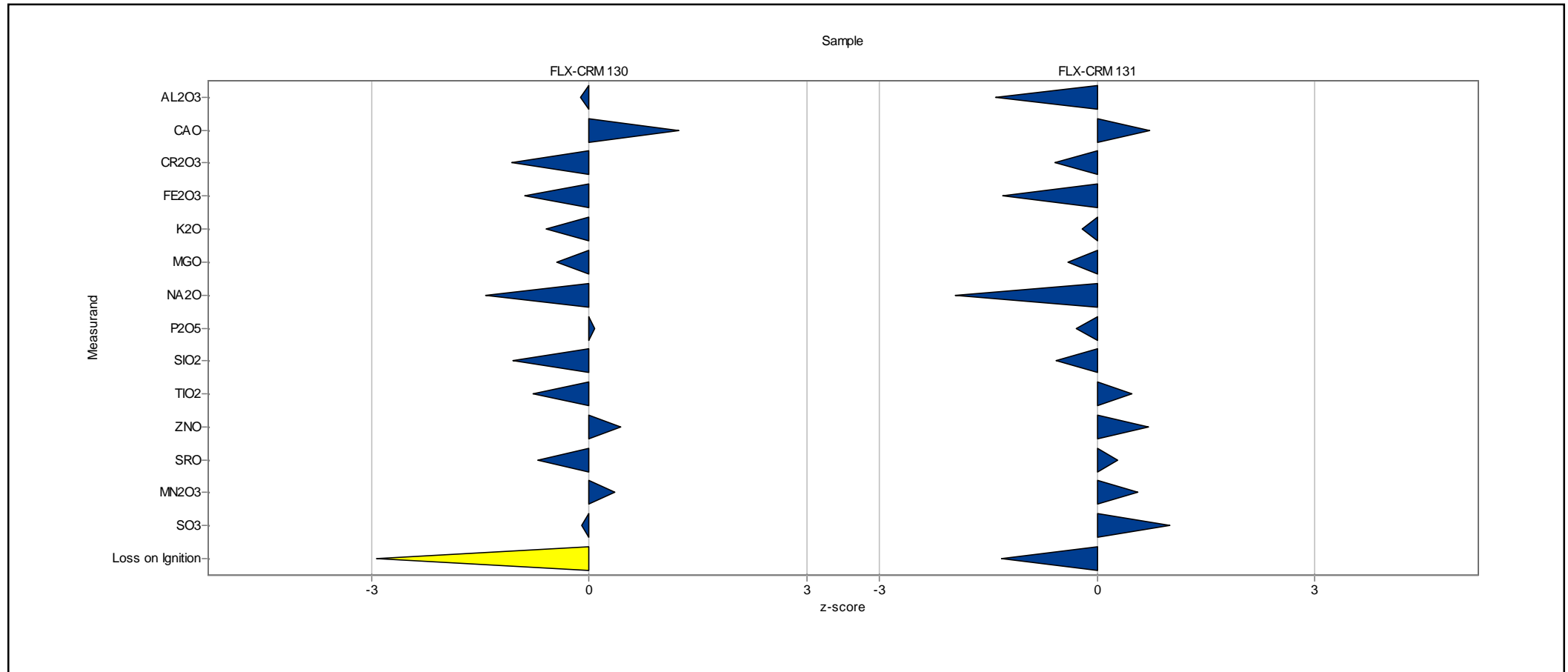
Laboratory: 21b



RV130 (Cement)

## Laboratory chart of z-scores

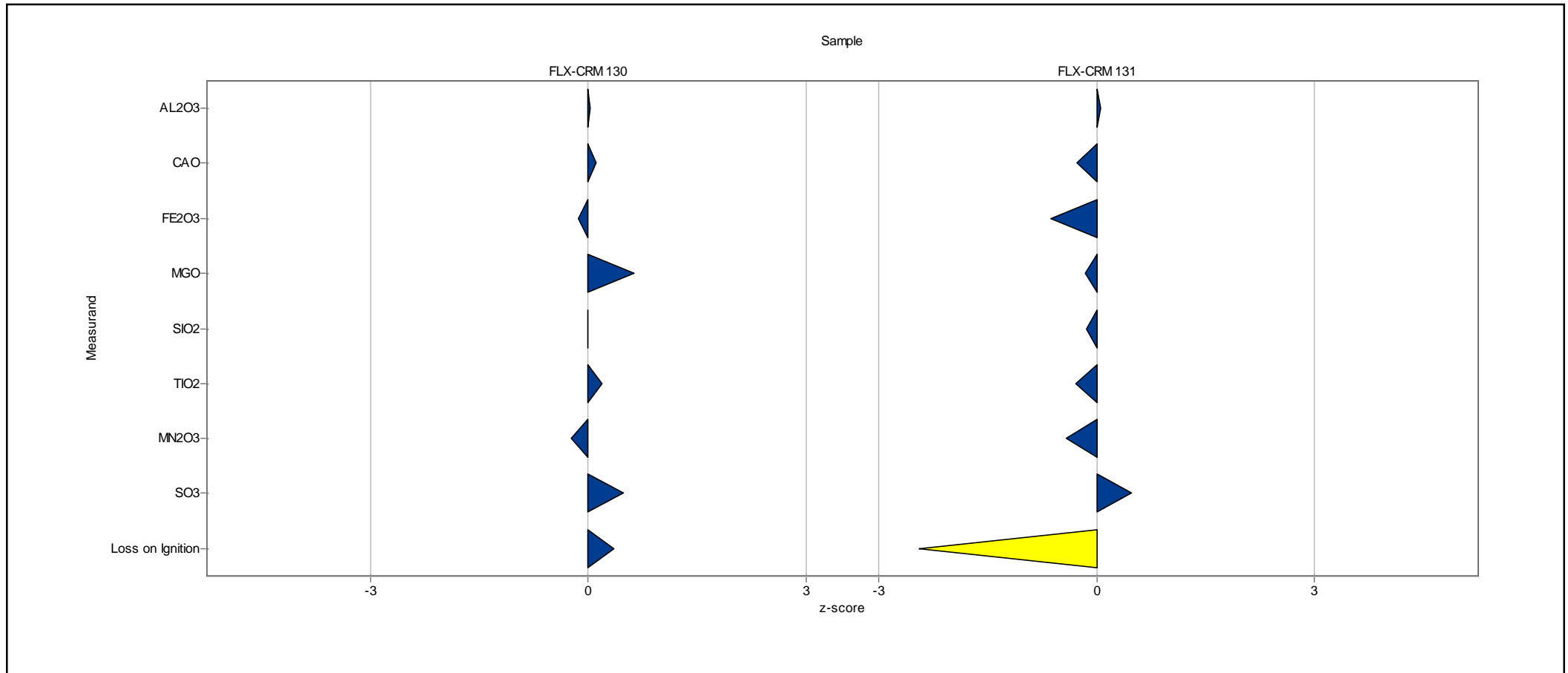
Laboratory: 22



RV130 (Cement)

## Laboratory chart of z-scores

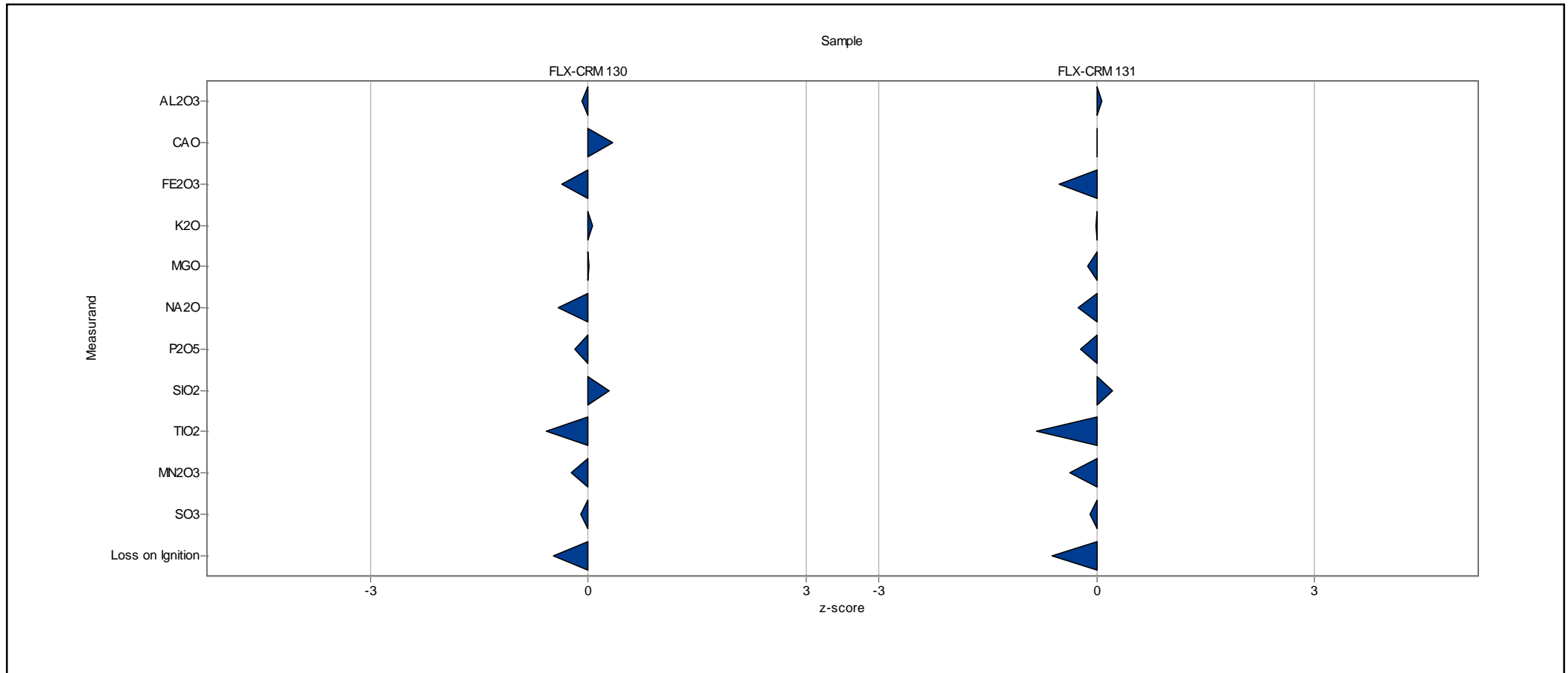
Laboratory: 23



RV130 (Cement)

## Laboratory chart of z-scores

Laboratory: 24



RV130 (Cement)

## Laboratory chart of z-scores

Laboratory: 25

