ITAK

# PROFICIENCY TEST PLAN FOR BAUXITE 2026

Ensaios de Proficiência
ABNT NBR
ISO/IEC 17043

PEP 0021

## ACCREDITATION

ITAK – Instituto de Tecnologia August Kekulé is an ABNT NBR ISO / IEC 17043 Proficiency Testing provider accredited by "Coordenação Geral de Acreditação do Inmetro (Cgcre)", for the following PTs: Iron Ore, Gold Ore, Copper Ore and Concentrates, Nickel Ore, Silver, Ferroniobium, Bauxite and Phosphate Rock.

We aim to provide continuous improvement practices in performing chemical analyses worldwide to our customers.

The project will continue in 2026 with five (5) rounds, and the laboratories of such markets will be invited to join the group of participants.

## BENEFITS

Besides being an impartial tool for assessing laboratory performance, participation in proficiency tests has several benefits, such as:

✓ Adherence to one of the requirements of ISO / IEC 17025 for companies already Accredited, or seeking accreditation on this ISO standard or other quality systems.
✓ Increased metrological reliability of the results obtained by the laboratory from their levels of precision and accuracy.
✓ Comparison with other industry laboratories and finding improvement opportunities to increase performance level (benchmarking).
✓ The opportunity of evaluation and comparison of methodologies, seeking one that best suits the level of accuracy required for specific parameters and levels.
✓ Awareness of the type of deviations that may be made by the laboratory (systematic or random), guiding actions to eliminate/minimize them.
✓ Identify staff training needs; and/or normalization or improvement of analytical methods.

## CONFIDENTIALITY

All information regarding Proficiency Test participants is treated as confidential and proprietary to the client. The only public information available in each round's report is the names of the participants. A confidentiality agreement with ITAK binds individuals who have access to this information.

When required by law or authorized by contractual commitments, ITAK will disclose confidential information, and the affected participant will be notified of such disclosures, except if prohibited by law.

If ITAK receives information about the participant from sources other than the participant, such as a complainant or regulatory authority, ITAK will ensure that this information remains confidential. The identity of these sources will also be kept confidential and not disclosed to the participant unless the source agrees to share that information.

According to the confidentiality protocol implemented by ITAK, laboratories are assigned distinct numerical codes. Each participant is granted access exclusively to their code, effectively preventing any possibility of collusion among participants. In case of any suspected collusion, the Program's coordination team will conduct a thorough investigation and take appropriate action.

The report for each round includes a list of participants, excluding lab codes to maintain confidentiality. By confirming participation, the laboratory agrees to have your name included in the report. If you prefer not to have your name mentioned, please inform us via email at interlab@itak.com.br.

Participating laboratories understand and agree that their reported results may be utilized by ITAK for the characterization of reference materials used as test items in the Proficiency Tests. Confidentiality will always be maintained.

## STATISTICAL TREATMENT

If this Proficiency Test uses a Statistical model with designated values and Standard deviation from Certified Reference Materials, a minimum number of participants is not required.

If the Proficiency Test uses a Statistical model with Consensus values, a minimum of six participants is required.

If the Proficiency Test uses a Statistical model that involves Consensus values from expert participants after removing outliers, a minimum of three participants is required for evaluation.

According to the results of accurate assessments, the performance of the participants can be classified as satisfactory, unsatisfactory, or questionable for each evaluated parameter.

If the participant does not provide complete data for evaluation for some specific analyses, the report will be issued as “insufficient data”.

Each statistical technique has its use limited and conditioned to the number of participants who report numerically valid results and are approved in the Evaluation and Treatment Outliers.

## SAMPLES AND ANALYSES

For each round, the participants will receive 10 samples referring to two reference materials of different concentrations to evaluate the analysis of different levels of concentration (5 sachets with samples of the first test item, and 5 sachets of the second test item).

The samples used in the Proficiency Test are Reference Materials (RM) with proven homogeneity and stability. RMs are produced by ITAK following the ISO 9001 Quality Management System and ISO quality protocols (ISO Series Guide 30 to 35) and ABNT NBR ISO 17034 - General requirements for the competence of reference materials producers.

The participating laboratory is required to undertake one (1) independent determination in each sample, preferably in five (05) different days, analyzing a couple a day, employing one or more validated analytical methods. The methods used should be reported with the results. The samples must be analyzed as ordinary routine samples of the laboratory, without any special treatment.

The parameters to be determined in each sample are listed below:

- ✓ **Available $Al_2O_3$, Total $Al_2O_3$, $Fe_2O_3$, Reactive $SiO_2$, Total $SiO_2$, $TiO_2$, $P_2O_5$, $ZrO_2$, $V_2O_5$, MnO, CaO and LOI (Loss On Ignition).**
- ✓ Note: $V_2O_5$ is not accredited.

The samples will be sent by ITAK from João Monlevade / MG, under the guidance of the Participant Laboratory, using an appropriate way to transport them. In case of loss or damage to any test item, ITAK will evaluate the possibility of replacement, which will depend on how it can be transported and the delivery deadline, so as not to compromise the schedule.

It is the participant's responsibility to follow up and clarify the shipment through customs or the carrier when it is required. If samples come back to ITAK because of incorrect address information or because the laboratory has not clarified the shipment through customs, ITAK can charge reshipping expenses.

Test items can be shipped by using customer accounts on FedEx, DHL, and UPS carriers.

Along with the samples will also follow instructions directing the Participating Laboratory on how to treat the samples, carry out the analyses, and report the analytical results.

Any communication about this Proficiency Testing, such as doubts, reporting of results, technical reports, and certificates of participation, is by software at pep.itak.com.br for participating laboratories.

In addition to their test results and methodologies, ITAK PT participants should also report the measurement uncertainties of each analyzed parameter (if available). It has to be sent as the Standard Uncertainty Combined, without application of any coverage factor, which would make it Expanded Uncertainty. Such data should be reported in specific fields in the ITAK PT Management System.

Invalid analytical results, such as "less than" or "zero", are not amenable to statistical evaluation. Therefore, in these situations, ITAK will not do the participant performance evaluation.

## ANALYTICAL METHODS

The participant laboratory should use its routine procedures to analyze the requested parameters. The suggested analytical methods for the **Proficiency Test for Bauxite Analysis are**:

- ✓ **Available $Al_2O_3$:** Alkaline dissolution (NaOH) and determination by ICP-OES or the Titrimetric method.
- ✓ **Total $Al_2O_3$:** Fusion and determination by XRF or Acid dissolution and Titrimetric method.
- ✓ **$Fe_2O_3$, $ZrO_2$:** Fusion and determination by XRF.
- ✓ **Reactive $SiO_2$:** Acid dissolution and determination by UV/V or Gravimetric method.

- ✓ **Total $SiO_2$:** Fusion and determination by XRF or Gravimetric method.
- ✓ **$TiO_2$, $P_2O_5$, MnO, $V_2O_5$ e CaO:** Fusion and determination by XRF; Acid dissolution and determination by ICP-OES;
- ✓ **Loss on ignition (LOI):** Gravimetric method.

The methods used should be informed by, whenever possible, the standard "Digestion Technique / Instrument Finish" using simplified codes as examples below:

- Fusion and X-Ray Fluorescence finish: **FUS-XRF**.
- Pressed Pellet and X-Ray Fluorescence finish: **POP-XRF.**
- Fusion and determination by ICP-OES: **FUS-ICP**
- Alkaline digestion (NaOH) and determination by ICP-OES: **DIGALK-ICP.**
- Alkaline digestion (NaOH) and determination by titrimetric method: **DIGALK-TIT.**
- Alkaline digestion (NaOH) and determination by Atomic Absorption Spectrometry: **DIGALK-AAS.**
- Alkaline digestion (NaOH) and determination by gravimetric: **DIGALK-GRA.**
- 4 acid digestion (HF,$HNO_3$,$HClO_4$,HCl) and titrimetric method: **DIG4AC-TIT**.
- 4 acid digestion (HF,$HNO_3$,$HClO_4$,HCl) and ICPOES finish: **DIG4AC-ICP**.
- Gravimetric method: **GRA**;
- Thermogravimetric Analysis: **TGA**;
- Colorimetric method: **COL.**

## SCHEDULE

The proposed schedule is presented in the table below; however, it can be adjusted as required. The official schedule will be available on the PTP Management System and/or communication related to each round.

| Steps of the Program | 1st Round (48th round) | 2nd Round (49th round) | 3rd Round (50th round) | 4th Round (51st round) | 5th Round (52nd round) |
|---|---|---|---|---|---|
| 1- Sending invitations | 05/12/25 | --- | --- | --- | --- |
| 2-Confirmation of participants | 20/Feb | --- | --- | --- | --- |
| 3- Sending samples to the participants | 14/Apr | 10/Jun | 10/Jul | 14/Aug | 30/Set |
| 4- Receiving samples by the participants | 30/Apr | 24/Jun | 23/Jul | 31/Aug | 14/Oct |
| **5- Completion of the analyses and report of the results by the participants** | **29/May** | **10/Jul** | **15/Aug** | **30/Sep** | **16/Nov** |
| 6- Preparation and delivery of the Performance Report to the participants. | 18/Jun | 27/Jul | 30/Aug | 09/Oct | 01/Dec |

| | |
|---|---|
| 7-Registration of appeals | Up to 10 days after the report is submitted |
| 8- Reply to appeals | Up to 15 days after the filing of the appeal |

**Note:** the dates in bold (item 5) must be met to avoid delays in issuing the results, which can compromise the subsequent rounds of the program. If delays occur, the Program Coordination must be contacted to assess the possibility of extending the deadline without compromising the schedule or causing loss to the other participants. If there are unjustified delays, ITAK may close the rounds without the missing results.

## REQUIREMENTS FOR PARTICIPATION

Laboratories that wish to participate in this Proficiency Test must be legally registered organizations equipped with the necessary technical capabilities and equipment to perform the required chemical analyses and confirm their participation by the deadline specified in the schedule.

## PERFORMANCE REPORT

For each round**, ITAK** will issue a personalized digital Interlaboratory Performance Evaluation Report under confidentiality identification for the internal evaluation of the Participant Laboratory and identify improvement opportunities.

If a participant wishes to obtain a report from another unit within the same business group, they must request it directly from the person in charge or through formal authorization from that individual. Please note that preliminary reports will not be issued.

If required, ITAK may rectify or ratify reports provided that such corrections do not require further statistical processing of data. All rectification generates a new version and new report number that will replace the previous version when published and communicated.

If required, by law, the performance report can be delivered or presented to the Regulatory Entity or Public Prosecutor's Office without the participant's permission and will be formally and previously communicated.

If it is not possible to deliver the performance report on the date planned in the schedule, the participants will be promptly notified of the possible delay and the new delivery date.

ITAK Interlaboratory Performance Report is accepted as an ISO/IEC 17025 requirement.

## APPEAL

The participant in ITAK's Proficiency Test has the right to appeal against their performance evaluation on the Technical Report.

The participants who have doubts or disagree with the performance evaluation must register their appeal in the "Appeals" field in the Proficiency Test Management System.

Meeting a requirement of ABNT NBR ISO/IEC 17043 - Conformity assessment — General requirements for proficiency testing, ITAK has a procedure that manages this process.

## INVESTMENT

Request a proposal by email.

ITAK has an attractive discount policy, such as participation of several units of companies belonging to the same economic group, discounts for laboratories' participation in more than one PT, discounts for purchase of ITAK's CRM, etc.

Find out more by contacting us at: interlab@itak.com.br

All customs duties are participants' responsibility.

ITAK must receive the total amount without any deductions, such as bank fees or taxes applied. It is necessary to take them into account before sending us the payment.

## SUBCONTRACTED ACTIVITIES

For this PT, homogeneity test analyses of Reference Materials used as samples (test items) can be subcontracted from competent laboratories.

All laboratories are evaluated and qualified in the ITAK's Quality Management System for these analyses, providing results with which, after appropriate statistical treatment, the designated values, standard deviations, and uncertainties are obtained for the Proficiency Test.

## COORDINATION TEAM

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