

DUBAI ACCREDITATION DEPARTMENT

REPORT ON PTP 209TH INTER-LABORATORY PROFICIENCY TESTING PROGRAM DETERMINATION OF GOLD IN GOLD JEWELLERY ALLOYS

Date: 26 June 2011

1. INTRODUCTION

This document presents the results of the 209th inter-laboratory proficiency-testing program conducted during the month of May involving the determination of **gold in gold jewellery alloys** with nine laboratories participating.

This program is part of the Inter-laboratory Comparison Programs organized by Dubai Accreditation Department (DAC) of Dubai Municipality (DM) for monitoring the validity of test results and to ensure the competent of accredited and registered laboratories operating in Dubai as a requirement of the law no. 2/2010 and ISO/IEC 17011: 2004.

For this inter-laboratory comparison proficiency testing program DAC used strips of gold purchased from a gold factory accompanied with analysis certificate.

2. EXPERIMENTAL DESIGN

2.1 Participants:

A total of nine laboratories participated in this program. One of them is governmental laboratory.

2.2 Samples Tested:

The samples, consisted of gold strips of approximately 2 grams each, were distributed to all participating laboratories. The test samples were prepared from one gold strip divided into nine samples, which were randomly assigned to the nine participating laboratories with each participant being given one gold strip with a unique identification number provided during the time of collection.

3. CONFIDENTIALITY

Each laboratory is given a code number to maintain confidentiality of results and to protect their identities. Only the concerned laboratory knows its code number.

If you have doubt about your code number please don't hesitate to contact Dr. Yaser Saleh Rahag (Tel: 302 7074) to know your code number.

4. TEST METHOD

Instructions were given to the participants to test the samples for determination of Gold in Gold Jewellery alloys-Cupellation Method (Fire Assay) as per BS EN ISO 11426:1999.

5. TEST RESULTS

The test results submitted by the participating laboratories are presented in Appendix A. In order to protect the identity of the participating laboratories, each one was assigned a

DUBAI ACCREDITATION DEPARTMENT

code number. The numbers in the column headings, Lab #, of the tables represents the code numbers for the participating laboratories.

6. EVALUATION OF RESULTS

6.1 Method of Analysis

The analysis of the participant's results is based on *ISO 13528:2005 (Statistical Methods for the Use in Proficiency Testing by Inter-laboratory Comparisons)*

6.2 Calculations of Z- scores

Appendix B gives the details of the calculation of the laboratories results and their Z-Scores which are obtained from the raw data. Also Z- Score and participant's results are represented in a bar chart and X-Y scattered plots C. The Z-Score calculation is based on an international Standard (*ISO 13528:2005*).

6.3 Outlier Results

Test	Labs outside the z-scores ± 3
gold in gold jewellery alloys	Lab 53; Lab 112;

After evaluating the Z-Score, the test results provided by the abovementioned laboratories are outside the Z – score limits ± 3 , the abovementioned laboratories are requested to investigate the root cause of the outlier results, implement a appropriate corrective action and a report shall be available for checking by the auditor during the nearest audit visit.

Also other participating laboratories have showed Z-score values two or higher than two which representing not outlier but a warning limit, these laboratories are advised to investigate the potential root cause of such results.

7. APPENDICES

7.1 Appendix A: Raw Data

7.2 Appendix B: Calculation of z-scores and other statistics

7.3 Appendix C: Charts

7.4 Appendix D: Test Report from the Factory

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Gold in Gold Jewellery Alloys

Appendix A: Raw Data

The Average Gold Content (%)

Lab #	Results
Lab G03	875.720
Lab 10	875.860
Lab 5	876.100
Lab 53	875.100
Lab 109	875.900
Lab112	875.020
Lab 115	876.011
Lab X1	876.000
Lab X2	875.370

Gold in Gold Jewellery Alloys

Appendix B: Calculation of z-scores and other statistics

The Average Gold Content (%)

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.34	(xi-x*) ²	0.31	(xi-x*) ²	0.31	(xi-x*) ²	0.31	(xi-x*) ²	0.31	(xi-x*) ²	0.31	(xi-x*) ²	
$x^* - \delta$	---		875.52		875.48		875.48		875.48		875.48		875.48		
$x^* + \delta$	---		876.20		876.11		876.11		876.11		876.11		876.11		
Lab112	875.020	0.84	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	-3.72
Lab 53	875.100	0.76	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	-3.34
Lab X2	875.370	0.49	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	875.52	0.07	-2.04
Lab G03	875.720	0.14	875.72	0.01	875.72	0.01	875.72	0.01	875.72	0.01	875.72	0.01	875.72	0.01	-0.36
Lab 10	875.860	0.00	875.86	0.00	875.86	0.00	875.86	0.00	875.86	0.00	875.86	0.00	875.86	0.00	0.31
Lab 109	875.900	0.04	875.90	0.01	875.90	0.01	875.90	0.01	875.90	0.01	875.90	0.01	875.90	0.01	0.50
Lab X1	876.000	0.14	876.00	0.04	876.00	0.04	876.00	0.04	876.00	0.04	876.00	0.04	876.00	0.04	0.98
Lab 115	876.011	0.15	876.01	0.05	876.01	0.05	876.01	0.05	876.01	0.05	876.01	0.05	876.01	0.05	1.03
Lab 5	876.100	0.24	876.10	0.09	876.10	0.09	876.10	0.09	876.10	0.09	876.10	0.09	876.10	0.09	1.46
Average	875.68		875.80	0.42	875.80	0.42	875.80	0.42	875.80	0.42	875.80	0.42	875.80	0.42	
SD	0.41		0.23	0.03	0.23	0.03	0.23	0.03	0.23	0.03	0.23	0.03	0.23	0.03	
New x*	875.86	0.15	875.80	0.18	875.80	0.18	875.80	0.18	875.80	0.18	875.80	0.18	875.796	0.18	
New s*	0.22		0.21		0.21		0.21		0.21		0.21		0.208		

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Target value	875.796
Low Acceptable	875.171
High Acceptable	876.421
Acceptable Range	875.171 - 876.421

Gold in Gold Jewellery Alloys

Appendix C:Charts

The Average Gold Content (%)

