

## DUBAI ACCREDITATION DEPARTMENT

### REPORT ON PTP 165<sup>TH</sup> INTER-LABORATORY PROFICIENCY TESTING PROGRAM DETERMINATION OF GOLD IN GOLD JEWELLERY ALLOYS

Date: 27 August 2008

#### 1. INTRODUCTION

This document presents the results of the 165<sup>th</sup> inter-laboratory proficiency-testing program conducted during the month of July involving the determination **gold in gold jewellery alloys** with four 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 of laboratories operating in Dubai as per requirement of the Local Order 52/1990 and ISO/IEC 17011: 2004.

For this inter-laboratory comparison proficiency testing program DAC used an approved subcontractor for the supply of samples. All other activities are undertaken by Dubai Accreditation Department.

#### 2. EXPERIMENTAL DESIGN

##### 2.1 Participants:

A total of four laboratories participated in this program.

##### 2.2 Samples Tested:

The samples, consisted of gold of approximately 1.5 gram each, were distributed to all participating laboratories. The test samples were prepared from one gold bar divided into four samples, which were randomly assigned to the four 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. For this particular program an email will be sent to each participating laboratory regarding its ID no. once the report has been posted on the website of DAC.

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### 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 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 analysis is based on an international Standard (*ISO 13528:2005*).

#### 6.3 Outlier Results

After evaluating the Z-Score, the results from all participating laboratories are found within the Z-score limits of  $\pm 3$ , therefore, all the results are acceptable.

### 7. APPENDICES

7.1 Appendix A: Raw Data

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

7.3 Appendix C: Charts

---- End of Report ----

## Gold in Gold Jewellery Alloys

### Appendix A: Raw Data

Lab #	Results
Lab 1	880.00
Lab 2	880.50
Lab 3	880.73
Lab 4	880.30

**Gold in Gold Jewellery Alloys**

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

Iteration	0		1		2		3		4		5		6		Z Score
$\delta = 1.5 s^*$	---	xi-x*	0.48	(xi-x*) <sup>2</sup>	0.46	(xi-x*) <sup>2</sup>	0.46	(xi-x*) <sup>2</sup>	0.46	(xi-x*) <sup>2</sup>	0.46	(xi-x*) <sup>2</sup>	0.53	(xi-x*) <sup>2</sup>	
$x^* - \delta$	---		879.92		879.93		879.93		879.93		879.86				
$x^* + \delta$	---		880.88		880.84		880.84		880.84		880.91				
LAB 1	880.00	0.40	880.00	0.15	880.00	0.15	880.00	0.15	880.00	0.15	880.00	0.15	880.00	0.15	-1.26
LAB 2	880.50	0.10	880.50	0.01	880.50	0.01	880.50	0.01	880.50	0.01	880.50	0.01	880.50	0.01	0.39
LAB 3	880.73	0.33	880.73	0.12	880.73	0.12	880.73	0.12	880.73	0.12	880.73	0.12	880.73	0.12	1.14
LAB 4	880.30	0.10	880.30	0.01	880.30	0.01	880.30	0.01	880.30	0.01	880.30	0.01	880.30	0.01	-0.27

Average	880.38		880.38	0.29	880.38	0.29	880.38	0.29	880.38	0.29	880.38	0.29	880.38	0.29
SD	0.31		0.31	0.07	0.31	0.07	0.31	0.07	0.31	0.07	0.31	0.10	0.31	0.07
New x*	880.40	0.22	880.38	0.27	880.38	0.27	880.38	0.27	880.38	0.27	880.38	0.31	880.38	0.27
New s*	0.32		0.30		0.30		0.30		0.30		0.35		0.30	

N        4

Target value	880.38
Low Acceptable	879.47
High Acceptable	881.30
Acceptable Range	879.47-881.4

# Gold in Gold Jewellery Alloys

## Appendix C:Charts

