

*Finalized & Validated by Industrial Advisory Group (IAG) 13th December 2013*

# **National Competency Standards**

**For**

**Gemologist**

## **Introduction**

The National Competency Standards are written specifications of skill and knowledge competencies required in a particular trade. The competency standards are developed in collaboration with United Nations Industrial Development Organization (UNIDO), GIZ and National Vocational & Technical Training Commission (NAVTTTC).

Industry experts from the relevant industries from different geographical locations across Pakistan were consulted during the development process of these competency standards to ensure input and ownership of all the stakeholders. NAVTTTC approves these competency standards on the recommendation of Industry Advisory Group (IAG) for the Gemstone & Jewelry Sector.

The National Competency Standards could be used as a referral document for the development of curricula to be used by training institutions.

## Contents

STRUCTURE OF COMPETENCY STANDARDS .....	4
Competency Unit .....	4
Overview .....	4
Performance Criteria.....	4
Knowledge and Understanding .....	4
Tools & Equipment.....	4
COMPETENCY MAP .....	5

## **STRUCTURE OF COMPETENCY STANDARDS**

Competency Standards are performance specifications that identify the knowledge and competencies an individual needs to succeed in the workplace. A competency standard has the following elements:

### **Competency Unit**

A competency unit is a statement which points to an outcome that employers will value and is observable and assessable. The competency unit is derived during the process of Occupational Analysis and is called 'Task Statement' in a DACUM Chart.

### **Overview**

An overview is a description of the competency standard. It briefly describes the purpose and linkage of the competency unit with a job role.

### **Performance Criteria**

Performance criteria statements set the standard of performance of a task in a job role. It describes 'how well' a task or competency unit is to be performed. It should be observable and written in a measurable term. It is one of the basic criteria for conducting assessment of the performance of a tradesman.

### **Knowledge and Understanding**

Supporting knowledge and understanding statements include the essential knowledge and understanding, covering facts, principles, procedures, processes and methods. These statements cover the basic knowledge and understanding that is required to master a competency unit in an occupation.

### **Tools & Equipment**

All the related tools, equipment and machinery that are required to perform a particular competency unit or task are listed under this heading.

## COMPETENCY MAP

### A. Inspect Stones

<b>A1</b> Assess crystal system	<b>A2</b> Test Refractive Index	<b>A3</b> Test polarization	<b>A4</b> Perform hardness test	<b>A5</b> Perform specific gravity test
<b>A6</b> Perform thermal conductivity test	<b>A7</b> Perform inclusion study	<b>A8</b> Certify Stones		

### B. Perform Grading of Stones

<b>B1</b> Grade by clarity	<b>B2</b> Grade by cut	<b>B3</b> Grade by color	<b>B4</b> Grade by carat weight
----------------------------	------------------------	--------------------------	---------------------------------

### C. Perform Marketing Activities

C1. Package the product	C2. Determine pricing	C3. Perform advertisement	C4. Arrange distribution of products
-------------------------	-----------------------	---------------------------	--------------------------------------

### D. Communicate with others

<b>D1</b> Build relations with customers	<b>D2</b> Supervise workers	<b>D3</b> Follow instructions from seniors	<b>D4</b> Establish linkage with suppliers.	
--	-----------------------------	--	---	--

## 1. Unit Title: Inspect Stones

Competency Unit	Overview	Performance Criteria	Knowledge & Understanding	Tools & Equipment
A1. Assess Crystal System	This unit of competency is performed to inspect the form and shape of gemstone.	<p><i>You must be able to:</i></p> <p>P1. Identify family of gemstone.</p> <p>P2. Ensure the sample stone is clean.</p> <p>P3. Operate testing equipment as per standard operating procedures.</p> <p>P4. Follow personal safety precautions as per requirement of work</p> <p>P5. Ensure the gemstone is not destructed and damaged during the course of assessment</p>	<p><i>You must know and understand:</i></p> <p>K1. Basic knowledge of crystallography</p> <p>K2. Use of tool/ equipment</p> <p>K3. Types, characteristics, and properties of gemstone.</p>	<p>1. Polariscope</p> <p>2. Wooden crystal</p>
A2. Test Refractive Index	This unit of competency is performed to identify the family of gemstone on the basis Refractive index.	<p><i>You must be able to:</i></p> <p>P1. Perform Refractive Test using refractometer as per SOP.</p> <p>P2. Ensure personal safety as per work procedures.</p> <p>P3. Wear safety gloves as per requirements.</p> <p>P4. Maintain lab for work having related</p>	<p><i>You must know and understand:</i></p> <p>K1. Values of refractive index.</p> <p>K2. RI of different gemstones.</p> <p>K3. Procedure of using RI-meter.</p> <p>K4. Safety precautions.</p>	<p>1. Refractometer</p> <p>2. RI Liquid</p> <p>3. Safety Gloves</p>

		<p>facilities.</p> <p>P5. Ensure sample is not damaged during performance of test.</p> <p>P6. Ensure sample is clean and ready for test.</p> <p>P7. RI liquid is disposed off in proper place.</p> <p>P8. Operate refractometer as per SOP.</p>		
A3. Perform Hardness Test	This unit of competency is performed to know about the hardness of gemstones, because different gemstones have different hardness.	<p><i>You must be able to:</i></p> <p>P1. Operate hardness pencil as per SOPs.</p> <p>P2. Ensure gemstone is not damaged during test.</p> <p>P3. Interpret the readings of Moho scale in terms of hardness of stone correctly.</p>	<p><i>You must know and understand:</i></p> <p>K1. Gemstone hardness.</p> <p>K2. Moho scale of hardness.</p> <p>K3. Hardness pencils.</p>	<p>1. Hardness pencil sets.</p> <p>2. Chart of Moho scale hardness.</p>
A4. Perform Specific Gravity Test	This unit of competency is performed to know the specific gravity of that particular sample (rough & cut) because different	<p><i>You must be able to:</i></p> <p>P1. Operate hydrostatic balance as per SOPs.</p> <p>P2. Calculate SG formula for the given material (gemstones) accurately.</p> <p>P3. Interpret specific gravity value of stone correctly.</p>	<p><i>You must know and understand:</i></p> <p>K1. Specific gravity values of different gemstones.</p> <p>K2. Use of hydrostatic balance.</p> <p>K3. Safety precautionary</p>	<p>1. Hydrostatic balance</p> <p>2. Water</p> <p>3. Calculator</p> <p>4. Tweezers</p>

	gemstones have different SG's.	P4. Follow safety precautions.	measures.	
A5. Perform Thermal Conductivity Test	This unit of competency is performed to thermal conductivity test to know about the thermal position of diamonds and its simulants.	<i>You must be able to:</i> P1. Operate diamond tester as per SOPs. P2. Ensure cleanliness of gemstone. P3. Interpret process of thermal conductivity test correctly. P4. Hold diamond and simulants as per procedure to avoid hard contact.	<i>You must know and understand:</i> K1. Diamonds and its simulants. K2. Thermal conductivity of diamonds and its simulants. K3. Procedure of operating diamond tester.	1. Gemstone cleaning cloth. 2. Diamond tester. 3. Tweezers. 4. Moisonite tester
A6. Perform Inclusion Study.	This unit of competency is performed to know the internal world of gemstone. To know the internal view of gemstones through microscope and loupe.	<i>You must be able to:</i> P1. Conduct inclusion study through loupe. P2. Conduct the inclusion with microscope. P3. Ensure polished / cut gemstone is used for inclusion study. P4. Operate microscope safely.	<i>You must know and understand:</i> K1. Inclusion of natural and synthetic gemstone. K2. Handling microscope. K3. Loupe.	1. Microscope. 2. Loupe. 3. Tweezers. 4. Gemstone cleaning cloth.
A7. Perform Ultraviolet Lamp study	This unit of competency is performed to know	<i>You must be able to:</i> P1. Interpret the behavior of gem material under long waves	<i>You must know and understand:</i> K1. Behavior of different gems under different light	1. UV lamp and its cabinet.

	the gemstones in different light conditions.	<p>P2. Interpret the behavior of gem material under short waves.</p> <p>P3. Note down the behavior of gemstone in particular light.</p> <p>P4. Operate UV lamp as per procedure.</p> <p>P5. Ensure occupational health and safety during study.</p>	<p>conditions.</p> <p>K2. Operating UV lamp as per SOPs.</p>	
A8. Certify Stones	This unit of competency is performed to collect information of all gemological tests and put them in order to identify a gemstone.	<p><i>You must be able to:</i></p> <p>P1. Collect information of gemological test according to SOPs.</p> <p>P2. Insert test results on a certificate as per requirements.</p> <p>P3. Endorse the certificate with seal.</p> <p>P4. Maintain record of the tests in proper files.</p> <p>P5. Ensure valid disclosure of test results.</p>	<p><i>You must know and understand:</i></p> <p>K1. Types of information.</p> <p>K2. Place in a systematic manner.</p> <p>K3. Listing conclusion.</p>	<p>1.Tabular chart</p> <p>2.Certificate</p> <p>3.Camera for gemstone picture</p> <p>4.Printer</p>

## 2. Unit: Perform Grading of Stones

Title	Overview	Performance Criteria	Underpinning Knowledge & Skills	Tools & Equipment
B1.Grade by	This unit of	<i>You must be able to:</i>	<i>You must know and understand:</i>	1.Loupe

clarity	competency is performed in order to see how much the stone is clear or inclusion free.	<p>P1. Collect gemstone clarity data through naked eye.</p> <p>P2. Perform clarity test in loupe 10X.</p> <p>P3. Assign clarity grades according to SOPs.</p>	<p>K1. Clarity of gemstones.</p> <p>K2. Inclusions.</p> <p>K3. Clarity grades according to SOPs.</p>	2. Clarity grade chart.
B2. Grade by cut	This unit of competency is performed to see the cut of a gemstone whether it is properly cut or having any defect.	<p><i>You must be able to:</i></p> <p>P1. Examine different types of stone cut.</p> <p>P2. Check the parameter of gemstones according to international standards of cuts.</p> <p>P3. Check any defects in its cutting.</p> <p>P4. Check pavilion and crown ration, griddle thickness and culet.</p>	<p><i>You must know and understand:</i></p> <p>K1. Types of cuts.</p> <p>K2. International standards of cuts.</p> <p>K3. Usage of vernier caliper.</p>	<p>1. Vernier caliper</p> <p>2. Cut grade chart.</p>
B3. Grade by color.	This unit of competency is performed to identify the major and minor shades of color.	<p><i>You must be able to:</i></p> <p>P1. Note the color visually.</p> <p>P2. Note the color with dichroscope.</p> <p>P3. Interpret color with the international color chart available for specific gemstone correctly.</p> <p>P4. Grade the gemstone color according to color charts.</p>	<p><i>You must know and understand:</i></p> <p>K1. Colors of gemstones.</p> <p>K2. Hue, tone, saturation of gemstones.</p>	<p>1. International standard chart of color.</p> <p>2. Dichroscope.</p>
B4. Grade by carat weight	This unit of competency is	<p><i>You must be able to:</i></p> <p>P1. Perform and calculate the weight of a</p>	<p><i>You must know and understand:</i></p>	1. Carat weight balance scale.

	performing to calculate weight of a gemstone that is under consideration.	gemstone on carat weight balance. P2. Record the weighting readings correctly and accurately. P3. Operate weight balance as per procedure.	K1. Carat weight K2. Carat weight balance K3. Procedure of operating carat balance scale.	2.Tweezers.
--	---	--	---	-------------

### 3. Unit: Perform Marketing Activities

Title	Overview	Performance Criteria	Underpinning Knowledge & Skills	Tools & Equipment
C1. Pack the product.	This unit of competency is designed to pack the product in a presentable manner that it should be labeled and safety is ensured.	<i>You must be able to:</i> P1.Determine packaging requirement as per product need. P2. Ensure safety of product in packaging. P3. Design packaging material as per products specification.	<i>You must know and understand:</i> K1. Packing according to international standards. K2. Labeling the product according to SOPs. K3. Designing packaging material. K4. Benefits of packaging.	1.Packing material 2.Labeling standards 3.Labeling tags 4.Labeling machine. 5.Packing machine
C2. Determine Price	This unit of competency is design in order to decide the price according to	<i>You must be able to:</i> P1. Evaluate the price as per costing. P2. Perform correct calculations of price. P3. Determine a price which is appealing	<i>You must know and understand:</i> K1. Marketing skills. K2. Price fluctuation in market.	1.Internet/ social media. 2.Invoice 3.Calculator. 4.Computer

	costing and market.	for customers. P4. Assess 4Cs of the gems correctly.	K3. Determining value. K4. Internet and social media knowledge.	5.Printer
C3. Perform advertisement	This unit of competency is performed in order to introduce the product in market.	<i>You must be able to:</i> P1. Selected effective media for promotion of the product. P2. Target relevant group of customers with promotion campaign. P3. Conduct promotion of products through sharing product samples. P4. Ascertain the need of potential market for products.	<i>You must know and understand:</i> K1. Advertisement cost. K2. Advertisement standards. K3. Marketing techniques. K4. Proper update information of products.	1.Laptop/computers 2.Website/ internet 3.Linked with social media 4. Print and electronic media.
C4. Arrange distribution of products.	This unit of competency is about distribution of products to different retailers and customers.	<i>You must be able to:</i> P1. Arrange economical and effective distribution line for the product. P2. Set distribution targets for the products. P3. Maintain distribution/sales record of different products. P4. Maintain record of retailers and customers.	<i>You must know and understand:</i> K1. Channels of distribution. K2. Distribution of products.	1.Register 2.Pen 3.vehicles

#### 4. Unit: Communicate with other

Title	Overview	Performance Criteria	Underpinning Knowledge & Skills	Tools & Equipment
D1. Build relations with customers	This unit of competency is designed to build good and permanent relationship with customerDs.	<p><i>You must be able to:</i></p> <p>P1. Offer after sales services.</p> <p>P2. Update customers with new products.</p> <p>P3. Kind and honest with customers.</p> <p>P4. Be polite with customers in dealing.</p> <p>P5. Keep record of customers.</p> <p>P6. Share details of new products with customers.</p>	<p><i>You must know and understand:</i></p> <p>K1. Maintaining data of related customers.</p> <p>K3. 4Ps and 4Cs of customers.</p>	<p>1.Data of customers</p> <p>2.Mobile</p> <p>3.Computer</p> <p>4.Reference</p> <p>5.Chambers</p>
D2. Supervise workers	This unit of competency is designed to manage the workers and other personnel that can help in improving work quality and quantity.	<p><i>You must be able to:</i></p> <p>P1. Perform the duty with other team members.</p> <p>P2. Supervise the work and achieve targets in minimum time.</p> <p>P3. Give clear direction to workers.</p> <p>P4. Check efficiency of workers/ team members.</p> <p>P5. Motivate the workers in order to enhance the efficiency of workers.</p>	<p><i>You must know and understand:</i></p> <p>K1. Assigned task</p> <p>K2. Management skills</p> <p>K3. Leadership qualities</p> <p>K4. Being team leader</p>	<p>1.Notice board</p> <p>2.Schedule</p> <p>3.Web portal</p>

		<p>P6. Make work environment comfortable for workers.</p> <p>P7. Evaluate workers on the basis of performance.</p>		
D3. Follow instructions from seniors	This unit of competency deals with following instructions of the seniors to perform proper job.	<p><i>You must be able to:</i></p> <p>P1. Seek guidance from seniors.</p> <p>P2. Follow the instructions from seniors.</p> <p>P3. Consult seniors in case of emergency.</p>	<p><i>You must know and understand:</i></p> <p>K1. Knowledge of seniors to enhance the efficiency of products.</p> <p>K2. Senior suggestions and instructions.</p>	<p>1. Family members</p> <p>2. Friends of family members.</p> <p>3. Senior businessmen from different chambers</p> <p>4. Senior government officials.</p>
D4. Establish linkage with suppliers.	This unit of competency is to develop good relationships and linkage with raw material suppliers.	<p><i>You must be able to:</i></p> <p>P1. Keep good relationships in order to supply material in time.</p> <p>P2. Maintain record of the suppliers.</p> <p>P3. Identify relevant suppliers.</p>	<p><i>You must know and understand:</i></p> <p>K1. Supply chain management.</p> <p>K2. Maintaining record of suppliers.</p>	<p>1. Record register</p> <p>2. pen</p>