

شهادة الجودة

ORIGINAL



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GOZNAK

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**MOSCOW PRINTING FACTORY – A BRANCH OF
JOINT STOCK COMPANY “GOZNAK”**

QUALITY CONTROL DEPARTMENT

QUALITY CERTIFICATE

(The third shipment (72 millions) of the 500 Rial Banknotes for the Central Bank of Yemen)

**** All Goznak facilities – including its Laboratories - have received the ISO 9001:2008 for unified standards of quality management. The Certification was issued by TUV Nord (of the German Association for Accreditation).**

21.08.2017

Laboratory Quality Certificate for the 500 Yemeni Rial Banknote – Goznak

BANKNOTE PAPER

Test Date: February, 28 2017- Testing in Relative Humidity of 65 +/- 2 %

Characteristics	Requirements of Contract & International Standards for High-Quality Paper	Test Results on 500 specimen	Conclusions
Composition of paper	100 % new pure excellent cotton	(100 %)	Compliant
Weight (GSM)	95 +/- 5 (ISO 536)	(94)	Compliant
Strength (mean both direction)	Not less than 5000 Dual Band (ISO 5626)	(6505)	Compliant
Wetness Strength, %	not less than 35 (ISO 3781)	(52,5)	Compliant
Porosity (Bendsten), ml/min	no more than 35 (ISO 5636/3)	(23)	Compliant
Cobb 60 value, g/m2	30 -70 (ISO 535)	(54)	Compliant
Sheet size, mm	795 x 600 +/- 1	Compliant	Compliant
Color ΔE (L,a,b)	ΔE = no more than 1.5 L = 95,00 (ISO 5631) a = - 2,00 (ISO 5631) b = 11,00 (ISO 5631)	0.55 (L = 94.63) (a = - 2,17) (b = 10,63)	Compliant
Tear resistance (Elmendorf), mH mean both directions	not less than 700 (ISO 1974)	(966)	Compliant
Element for side and corner reinforcement	IRON FRAME	Compliant	Compliant
Watermark (three dimensional multi-tonal)	Emblem of the Republic of Yemen	Compliant	Compliant
Size of the watermark, mm	28 x 16 +/-1	Compliant	Compliant
Positioning of Watermark, mm	+/- 3	Compliant	Compliant
Electrotype (small white watermark)	500 denomination in Arabic	Compliant	Compliant
Size of the electrotype, mm	10 x 6 +/- 1	Compliant	Compliant
Security fibers - Color - Color under UV - Density (SQDM)	None (invisible to naked eye) blue 25-35 fibers per SQDM	Compliant Compliant (31)	Compliant
Security fibers - Color - Color under UV - Density (SQDM)	None (invisible to naked eye) green 25-35 fibers per SQDM	Compliant Compliant (30)	Compliant
Security Thread & Stripe partly embedded in paper (VFI)			
Characteristics	Requirements of Contract & International Standards for High-Quality Paper	Test Results on 500 specimen	Conclusions
Holographic Security thread (VFI): - Color - Demetallization - Fluorescence in UV (365 nm) - Width, mm - Position of thread, mm	Silver None None 5 (- 0.2 / + 0.1) +/- 3	Compliant Compliant Compliant 5mm Compliant	Compliant

Resistance of the VFI Security thread to various chemicals (score assessment): <ul style="list-style-type: none"> - Ethyl alcohol - Perchloroethylene - White spirit - Ethylene glycol - Natrium hydrate solution (2%) - Soap solution (10%) - Sulphuric acid (2%) - Hydrochloric acid (5%) - Acetic acid (20%) 	Not less than 2 according to 3 scores system	(3) (3) (3) (3) (2) (3) (3) (3) (3)	Compliant Compliant Compliant Compliant Compliant Compliant Compliant Compliant Compliant
Resistance of Breaking strength, MPa	not less than 110	(204)	Compliant
Resistance of Thread to Peeling from paper – Peeling Strength. N/cm	not less than 1.3	(1.40)	Compliant

FINISHED BANKNOTE (PRINTED)

Test Date: May, 22 2017

Characteristics	Requirements & Standards for High-Quality Banknotes	Test Results on 500 Specimen & Conclusion
Resistance of printed image to physical-and-chemical influences , security elements including		
T = 22 °C+/-2; τ = 30 min. +/-1 -Acetone -Xylene -Perchloroethylene -Ethyl alcohol -Ethyl acetate -Ethylene glycol -White spirit -Acetic acid (20% - water solution) -Hydrochloric acid (5% - water solution) -Sulphuric acid (2% - water solution) -Natrium hydrate (2% - water solution) -Sodium sulfide -Bleach powdering - Acid sweat - Alkaline sweat	Not less than 4 according to 5 scores system	(5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant (5) = Compliant
T = 80° C+/-3; τ = 30 min. +/-1 - Distilled water* - Soap (10% - water solution) - Detergent (1% - water solution) - Detergent (1%) and soda (1%) – water solution	Not less than 4 scores according to 5 score system	(5) = Compliant (4-5)= Compliant (4-5)= Compliant (4-5)= Compliant
T = 23° C+/-2; relative humidity 45% +/-5 - Wet rub resistance (Pruefbauquadrant)	Not less than 4 scores	(5) = Compliant
T = 125° C+/-2; τ = 10 min. +/-1 -Thermoresistance*	Not less than 4 scores according to 5 scores system	(5) = Compliant

Notes:

- *Resistance parameters of finished banknote to increased heat and moisture
- UV fluorescence parameters meet international quality requirements, established by leading security printers.

Printing Quality Control		
Characteristics	Requirements & Standards for High-Quality Banknotes	Test Results on 500 Specimen & Conclusions
Dimensions of Banknote	Length 155 mm x width 69 mm	Compliant
OBVERSE SIDE		
High Relief Intaglio printing	General View of Al-Mihdar Mosque; denominations 500 in Arabic in upper left hand side and lower right hand side; printing in the top center of the banknote of the words Central Bank of Yemen, followed by the words "issued in accordance with the Law of the Central Bank of Yemen", "on behalf of the Central Bank of Yemen", followed by the signature – all legends in Arabic; Blind Embossed geometrical patterns, repeated micro-text "Central Bank of Yemen" in Arabic; date of issue; patterns along the banknote edges.	Compliant
Offset Printing (9 colors)	Main background, see through element, Islamic patterns, Mosque dome HMC, micro-texts, anti-copy screens, the silhouette of a man and denomination (invisible element).	Compliant
Letter Press Printing (numbering):		Compliant
Horizontal number		
- Quantity of digits	1+7	Compliant
- Color	red	Compliant
- Color under UV	orange	Compliant
Vertical number		
- Quantity of digits	1+7	Compliant
- Color	black	Compliant
- Color under UV	green	Compliant

REVERSE SIDE		
Offset Printing (9 colors)	General view of Dar al-Hajar; main background; denominations 500 in numbers on the upper left hand side and lower right hand side; words Central Bank of Yemen in English at the top of the center of the banknote, denomination 500 in English at the bottom center of the banknote, see through element, Islamic round patterns, micro-texts, anti-copy screens, the eight-pointed star MVC, security feature 2D-iris.	Compliant

Special Inks – Obverse Side		
Visible ink with fluorescence in UV - Color - Fluorescence	Islamic Patterns blue/pink/yellow blue/pink/yellow	Compliant Compliant
Invisible ink with fluorescence in UV - Fluorescence	The silhouette of a man and denomination yellow/green	Compliant
Metametric ink - color	Lower part of the Mosque is visible under Infra Red light, other elements are dark blue, Intaglio printed, invisible under IR light - dark-blue	Compliant
Magnetic ink - color	Lower part of the Mosque - dark-blue	Compliant
Machine readable security feature Fantom FK		Compliant
Special Inks – Reverse Side		
Visible ink with fluorescence under UV - color - fluorescence	Islamic Patterns pink yellow/green	Compliant Compliant
Micro-text - Obverse side		
Positive Negative	“Central Bank of Yemen” in Arabic Denominations 500 in Arabic numbers	Compliant Compliant
Micro-text - Reverse side		
Negative Positive	Denomination 500 in English and Arabic numbers “FIVEHUNDREDRIALS”	Compliant Compliant
Security Background screens - Obverse side		
Positive Negative		Compliant Compliant
Security Background screens - Reverse side		
Positive Negative		Compliant Compliant
Registration Tolerances		
Registration Tolerance between Intaglio and offset printing (obverse side)	+/- 1.5 mm	Compliant
Registration tolerance for registration of offset inks	+/- 0.1 mm	Compliant

LABORATORY TEST CONCLUSIONS

The Paper and Printed Banknote of the 500 Yemeni Rial denomination, including all graphic arts security features (inks, security fibers, MVC ...etc.) are of high quality and fully compliant with Contract requirements and International Standards which provide their resistance to Heat, Humidity, Chemical Materials, Scratching, Peeling and other types of dangers of handling during the circulation of the banknote.

Thereby, we, Joint Stock Company “Goznak” confirm that THE QUALITY OF COTTON IS FIRST RATE AND STRENGTH OF THE PAPER AND ITS ORIGIN AND THE PRINTED NOTES IN THEIR FINISHED CONDITION ARE IN ACCORDANCE WITH GENERAL,

SECURITY TECHNICAL SPECIFICATIONS AND THE INTERNATIONAL STANDARDS
STATED IN THE CONTRACT SIGNED ON 14-TH DECEMBER 2016.

The present Quality Certificate is confirmed by test results performed by Goznak and is made in
two copies: one for each party.

Chief Technology Engineer  S.S. Lapshin

Head of Technical Laboratory  M.G. Yurchenko

Inspection Department Chief  N.A. Lazareva

Moscow Printing Factory – a branch of joint stock company "Goznak"