



**GHANA
STANDARDS
AUTHORITY**

Member

International Organisation for Standardisation (ISO)
African Regional Organisation for Standardisation (ARSO)

PROF. ALEX DODOO

GSA/ENG/101.7 (A)/VOL.1/44

2020-01-31

**THE OPERATIONS MANAGER
FERRO FABRIK LIMITED
P.O. BOX 303
TEMA**

Dear Sir,

QUALITY EVALUATION OF STEEL BAR

Please find attached the test report(s) on the above sample(s) with **Lab#(s) 56-63/ENG2/20** submitted for testing on 2020-01-29

We acknowledge receipt of an amount of **Four Thousand Ghana Cedis (GH¢4,000.00)** being the cost of the test.

Yours faithfully,

**C. E. FRIMPONG
DIRECTOR, PHYSICAL SCIENCE DIRECTORATE
For: DIRECTOR GENERAL**





GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.

Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code BM.....
Specific Product Code SP
Officer Responsible for Report TA.
Code of Approving Officer DA
Period of Report 01/2020
Lab. No. 56 Dept. ENG Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 8mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik/ Quality Evaluation

COURTESY OF: CSEI Fibre Fabrics Quality Evaluation						
TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	Piece A	Piece B	GS 788-2 :2018	8 Nominal
	Cross sectional Area	mm ²	8.1	8.1		50.3 Nominal
	Mass per meter length	kg/m	52.0	51.3		0.395
	Deviation of mass per meter length	%	0.409	0.403		± 8
ELO	Elongation	%	3.4	2.0		14 min
YLS	Yield Strength (R _{eH})	N/mm ²	20	20		550 min
TSS	Ult. Tensile Strength (R _m)	N/mm ²	628	628	-	
DTL	Ductility (R _m / R _{eH})	-	740	733	1.15 min	
BND	Bend	-	1.18 1.17		Shall be no cracks	
			No cracks			

Lab. No. 56/ENG2/20



GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

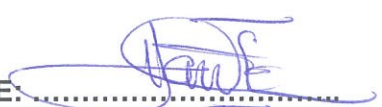
REMARKS:

- ◆ Sample conformed to the requirements for steel grade **B550** and to ductility class **C**.

Product sampled by: Client.

 SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: 2020-01-30
 SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 2020-01-30

Note: The results relate only to the items tested

- | | | |
|------------|---|--|
| Conditions | 1 | Not valid without Ghana Standards Authority's Seal. |
| | 2 | This report does not signify that product tested has been certified. |
| | 3 | Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority. |
| | 4 | This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority. |

Lab. No. 56/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.

Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code BM.....
Specific Product Code SP
Officer Responsible for Report TA.
Code of Approving Officer DA.
Period of Report 01/2020
Lab. No. 57 Dept. ENG Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 10mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2019-01-29 TO 2019-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
			Piece A	Piece B		
DIM	Dimension Diameter	mm	10.0	10.1	GS 788-2 :2018	10 Nominal
	Cross sectional Area	mm ²	78.3	80.3		78.5 Nominal
	Mass per meter length	kg/m	0.615	0.631		0.617
	Deviation of mass per meter length	%	0.3	2.2		± 6
ELO	Elongation	%	24	22		14 min
YLS	Yield Strength (R_{eH})	N/mm ²	522	577		500/550 min
TSS	Ult. Tensile Strength (R_m)	N/mm ²	617	701		-
DTL	Ductility (R_m / R_{eH})	-	1.18	1.21		1.15 min
BND	Bend	-	No cracks			Shall be no cracks

Lab. No. 57/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

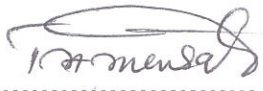
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

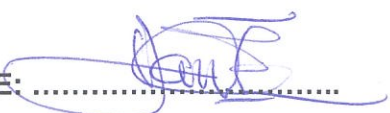
- ◆ Sample A conformed to the requirements for steel grade **B500** and to ductility class **C**.
- ◆ Sample B conformed to the requirements for steel grade **B550** and to ductility class **C**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: 

SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 

Note: The results relate only to the items tested

Conditions	1	Not valid without Ghana Standards Authority's Seal.
	2	This report does not signify that product tested has been certified.
	3	Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority.
	4	This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority.

Lab. No. 57/ENG2/20



**GHANA
STANDARDS
AUTHORITY**

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

**Your Ref.
Our Ref.:**

**To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA**

**LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.**

Codes

Generalised Product Code BM.....
Specific Product Code SP
Officer Responsible for Report TA.
Code of Approving Officer DA
Period of Report 01/2020
Lab. No. 58 Dept. ENG Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 12mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

SOURCE: SRP USE: FENOTABRIK / Quality Evaluation						
TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	Piece A 12.1	Piece B 11.9	GS 788-2 :2018	12 Nominal
	Cross sectional Area	mm ²	115.3	111.6		113 Nominal
	Mass per meter length	kg/m	0.905	0.876		0.888
	Deviation of mass per meter length	%	1.9	1.4		± 6
ELO	Elongation	%	22	22		14 min
YLS	Yield Strength (R _{eH})	N/mm ²	511	535		500 min
TSS	Ult. Tensile Strength (R _m)	N/mm ²	604	641		-
DTL	Ductility (R _m / R _{eH})	-	1.18	1.20		1.15 min
BND	Bend	-	No cracks			Shall be no cracks

Lab. No. 58/ENG2/20



GHANA STANDARDS AUTHORITY FORM

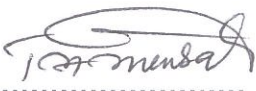
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

- ◆ Sample conformed to the requirements for steel grade **B500** and to ductility class **C**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: 2020-01-30

SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 2020-01-30

Note: The results relate only to the items tested

- | | | |
|------------|---|--|
| Conditions | 1 | Not valid without Ghana Standards Authority's Seal. |
| | 2 | This report does not signify that product tested has been certified. |
| | 3 | Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority. |
| | 4 | This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority. |

Lab. No. 58/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.
Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code	BM.....
Specific Product Code	SP
Officer Responsible for Report	TA.
Code of Approving Officer	DA.
Period of Report	01/2019
Lab. No. 59 Dept. ENG	Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 14mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	Piece A 13.5	Piece B 13.6	GS 788-2 :2018	14 Nominal
	Cross sectional Area	mm ²	144.1	146.0		154 Nominal
	Mass per meter length	kg/m	1.131	1.146		1.21
	Deviation of mass per meter length	%	7.0	5.6		± 5
ELO	Elongation	%	16	16		14 min
YLS	Yield Strength (R_{eH})	N/mm ²	592	595		550 min
TSS	Ult. Tensile Strength (R_m)	N/mm ²	700	703		-
DTL	Ductility (R_m / R_{eH})	-	1.18	1.18		1.15 min

Lab. No. 59/ENG2/20



GHANA STANDARDS AUTHORITY FORM

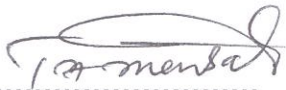
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

- ◆ Sample conformed to the requirements for steel grade **B550** and to ductility class **C**.
- ◆ Sample size is 13.5mm and not 14mm.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 

Note: The results relate only to the items tested

Conditions	1	Not valid without Ghana Standards Authority's Seal.
	2	This report does not signify that product tested has been certified.
	3	Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority.
	4	This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority.

Lab. No. 59/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.

Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code BM.....
Specific Product Code SP
Officer Responsible for Report TA.
Code of Approving Officer DA.
Period of Report 01/2020
Lab. No. 60 Dept. ENG Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 16mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
			Piece A	Piece B		
DIM	Dimension Diameter	mm	15.9	15.8	GS 788-2 :2018	16 Nominal
	Cross sectional Area	mm ²	197.6	196.9		201 Nominal
	Mass per meter length	kg/m	1.551	1.546		1.58
	Deviation of mass per meter length	%	1.9	2.2		± 5
ELO	Elongation	%	16	18		14 min
YLS	Yield Strength (R _{eH})	N/mm ²	577	544		550/500 min
TSS	Ult. Tensile strength(R _m)	N/mm ²	712	645		-
DTL	Ductility (R _m / R _{eH})	-	1.23	1.19		1.15 min
BND	Bend	-	No cracks			Shall be no cracks

Lab. No. 60/ENG2/20



GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

- ◆ Sample A conformed to the requirements for steel grade **B550** and to ductility class **C**.
- ◆ Sample B conformed to the requirements for steel grade **B500** and to ductility class **C**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: 2020-01-30SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 2020-01-30

Note: The results relate only to the items tested

Conditions	1	Not valid without Ghana Standards Authority's Seal.
	2	This report does not signify that product tested has been certified.
	3	Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority.
	4	This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority.

Lab. No. 60/ENG2/19



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.
Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code	BM.....
Specific Product Code	SP
Officer Responsible for Report	TA.
Code of Approving Officer	DA.
Period of Report	01/2020
Lab. No. 61 Dept. ENG	Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 20mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation						
TEST CODE	TEST CONDUCTED	UNIT	RESULTS		TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	Piece A 19.8	Piece B 19.9	GS 788-2 :2018	20 Nominal
	Cross sectional Area	mm ²	307.8	306.3		314 Nominal
	Mass per meter length	kg/m	2.416	2.404		2.47
	Deviation of mass per meter length	%	2.2	2.7		± 5
ELO	Elongation	%	15	18		14 min
YLS	Yield Strength (R _{eH})	N/mm ²	565	514		550/500 min
TSS	Ult. Tensile Strength (R _m)	N/mm ²	703	616		-
DTL	Ductility (R _m / R _{eH})	-	1.24	1.20	1.15 min	
BND	Bend	-	No cracks			Shall be no cracks

Lab. No. 61/ENG2/20



GHANA STANDARDS AUTHORITY FORM

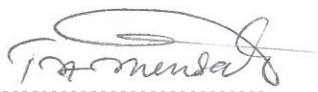
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

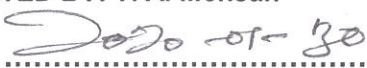
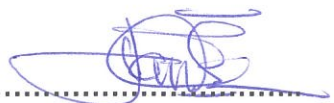
REMARKS:

- ◆ Sample A conformed to the requirements for steel grade **B550** and to ductility class **C**.
- ◆ Sample B conformed to the requirements for steel grade **B500** and to ductility class **C**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 

Note: The results relate only to the items tested

Conditions	1	Not valid without Ghana Standards Authority's Seal.
	2	This report does not signify that product tested has been certified.
	3	Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority.
	4	This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority.

Lab. No. 61/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.
Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code	BM.....
Specific Product Code	SP
Officer Responsible for Report	TA.
Code of Approving Officer	DA
Period of Report	01/2020
Lab. No. 62 Dept. ENG	Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 25mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

TEST CODE	TEST CONDUCTED	UNIT	RESULTS	TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	25.0	GS 788-2 :2018	25 Nominal
	Cross sectional Area	mm ²	491.6		491 Nominal
	Mass per meter length	kg/m	3.859		3.85
	Deviation of mass per meter length	%	0.2		± 4
ELO	Elongation	%	21		14 min
YLS	Yield Strength (R _{eH})	N/mm ²	511		500 min
TSS	Ult. Tensile Strength (R _m)	N/mm ²	632		-
DTL	Ductility (R _m / R _{eH})	-	1.24		1.15 min
BND	Bend	-	No cracks		Shall be no cracks

Lab. No. 62/ENG2/20



GHANA STANDARDS AUTHORITY FORM

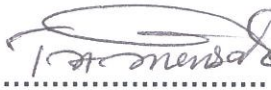
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

- ◆ Sample conformed to the requirements for steel grade **B500** and to ductility class **C**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 

Note: The results relate only to the items tested

- | | | |
|------------|---|--|
| Conditions | 1 | Not valid without Ghana Standards Authority's Seal. |
| | 2 | This report does not signify that product tested has been certified. |
| | 3 | Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority. |
| | 4 | This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority. |

Lab. No. 62/ENG2/20



GHANA
STANDARDS
AUTHORITY

GHANA STANDARDS AUTHORITY FORM

TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

Your Ref.

Our Ref.:

To: THE OPERATIONS MANAGER
FERRO FABRIK LTD
P.O.BOX 303 TEMA

LABORATORY CONDUCTING TEST
MECH. ENGINEERING LABORATORY
SHIASHIE (LEGON – MADINA ROAD)
GHANA STANDARDS AUTHORITY
P.O. BOX MB 245, ACCRA.

Codes

Generalised Product Code	BM.....
Specific Product Code	SP
Officer Responsible for Report	TA.
Code of Approving Officer	DA.
Period of Report	01/2020
Lab. No. 63 Dept. ENG	Source Code 2 Yr. 20

NAME OF SAMPLE: Steel for the reinforcement of concrete (Ribbed Bar, 32mm)

SAMPLE SIZE: Three (3)

DATE RECEIVED: 2020-01-29

DATE(S) OF PERFORMANCE: 2020-01-29 TO 2020-01-30

SOURCE/PURPOSE: Ferro Fabrik / Quality Evaluation

TEST CODE	TEST CONDUCTED	UNIT	RESULTS	TEST METHODS	SPECIFICATION GS 788-2 :2018
DIM	Dimension Diameter	mm	31.8	GS 788-2 :2018	32 Nominal
	Cross sectional Area	mm ²	795.0		804 Nominal
	Mass per meter length	kg/m	6.240		6.31
	Deviation of mass per meter length	%	1.1		± 4
ELO	Elongation	%	19		14 min
YLS	Yield Strength (R_{eH})	N/mm ²	459		420 min
TSS	Ult. Tensile Strength (R_m)	N/mm ²	520		-
DTL	Ductility (R_m/ R_{eH})	-	1.13		1.08 min
BND	Bend	-	No cracks		Shall be no cracks

Lab. No. 63/ENG2/20



GHANA STANDARDS AUTHORITY FORM

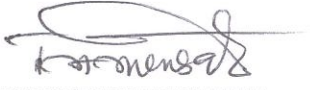
TITLE: Analytical Test Report

Doc. No.: GSA-FM-T09-E

REMARKS:

- ◆ Sample conformed to the requirements for steel grade **B420** and to ductility class **B**.

Product sampled by: Client.

SIGNATURE: 

REPORTED BY: T. A. Mensah

DATE: 

SIGNATURE: 

APPROVED BY: Daniel V. Arthur (Ing.)

DATE: 

Note: The results relate only to the items tested

- | | | |
|------------|---|--|
| Conditions | 1 | Not valid without Ghana Standards Authority's Seal. |
| | 2 | This report does not signify that product tested has been certified. |
| | 3 | Not to be used for litigation and advertisement without the written consent of the Director General of Ghana Standards Authority. |
| | 4 | This report shall not be reproduced in part or full without the written approval of the Director General of Ghana Standards Authority. |

Lab. No. 63/ENG2/20