

 Eskom	Report	Distribution
--	---------------	---------------------

Title: **TECHNICAL EVALUATION
CRITERIA FOR DUCT FIBRE
OPTIC CABLES**

Unique Identifier: **240-171000502**

Alternative Reference Number: **n/a**

Area of Applicability: **Engineering**


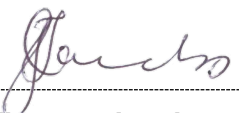
Documentation Type: **Report**

Revision: **2**

Total Pages: **17**

Next Review Date: **n/a**

Disclosure Classification: **Controlled
Disclosure**

Compiled by	Functional Responsibility	Authorized by
		
Lesiba Buthane Senior Advisor M&O Telecoms	Thuli Tladi Middle Manager Telecoms Operations	Thomas Jacobs Senior Manager Technology & Engineering (Acting)
Date: 19/09/2025	Date: 19/09/2025	Date: 19/09/2025

Content

	Page
1. Introduction	3
2. Supporting clauses	3
2.1 Scope	3
2.1.1 Purpose	3
2.1.2 Applicability	3
2.2 Normative/informative references	3
2.2.1 Normative	3
2.2.2 Informative	3
2.3 Definitions	3
2.3.1 General	3
2.3.2 Disclosure classification	3
2.4 Abbreviations	4
2.5 Roles and responsibilities	4
2.6 Process for monitoring	4
2.7 Related/supporting documents	4
3. Technical Tender Evaluation Procedure	4
3.1 Mandatory Criteria evaluation	5
3.2 Desktop Assessment	5
Submissions that pass the Mandatory criteria will proceed to the Desktop Evaluation.	5
3.2.1 Desktop DUCT Assessment	5
3.2.2 Desktop Factory File Assessment	6
3.3 Factory Assessment	6
3.3.1 Scope	6
4. Authorization	9
5. Revisions	9
6. Development team	9
7. Acknowledgements	9
Annex A – Table A2.1: Mandatory Criteria A/B Schedules Single Mode DUCT cable	10
Annex B - Table A2.2: Mandatory Criteria A/B Schedules Multimode DUCT cable	12
Annex C - Table A2.3: Mandatory Criteria Type Tests Single Mode DUCT cable	14
Annex D – Table A2.4: Mandatory Criteria Type Tests Multimode DUCT cable	15
Annex E – Table A2.5: Mandatory Criteria Type Tests Multimode DUCT cable	16

Tables

Table 1: Evaluation Steps for Eskom Technical Evaluation Team	4
Table 2: DUCT Mandatory Criteria	5
Table 3: Scoring of items in Technical Schedules A&B	5
Table 4: Desktop DUCT Evaluation	6
Table 5: Desktop Factory File Evaluation	6
Table 6: Scoring of items in Factory Evaluation	7

ESKOM COPYRIGHT PROTECTED

1. Introduction

This document aims to describe the criteria which will govern the evaluation of tender submissions by suppliers intending to supply DUCT fibre optic cables. The criteria for each cable core number are tabulated in the Annexes at the end of this document.

The criteria necessary to perform both the desktop and factory evaluations are outlined.

2. Supporting clauses

2.1 Scope

This document explains the technical evaluation process and criteria associated with DUCT fibre optic cables as described by the relevant Eskom standards.

2.1.1 Purpose

The purpose of this document is to describe the criteria which are to be used when evaluating tender submissions for the supply of fibre optic cables and hardware as well as the installation thereof.

2.1.2 Applicability

This document shall apply throughout Eskom Distribution Divisions.

2.2 Normative/informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] Insert normative document references here.
- [3] NRS 088-1 Duct and Direct Buried Underground Fibre Optic Cable Part 1: Product Specification
- [4] NRS 081 Single-Mode Non-Dispersion Shifted Optical Fibres
- [5] 240-72274830 Multimode Fibre Optic Duct Cable Standard

2.2.2 Informative

- [6] NRS 088-2 Duct and Direct Buried Underground Fibre Optic Cable Part 2: Installation Guidelines

2.3 Definitions

2.3.1 General

None.

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
FAT	Factory Acceptance Test
MM	Multimode
SM	Single Mode

2.5 Roles and responsibilities

Group Commercial are responsible for ensuring this document is adhered to within the commercial process.

2.6 Process for monitoring

Document shall be monitored by the Fibre Optic Technical Team for the duration of the contract.

2.7 Related/supporting documents

Not applicable.

3. Technical Tender Evaluation Procedure

The technical evaluation procedure is specific to the DUCT fibre optic cable specifications. The complete evaluation of any potential supplier would involve a desktop evaluation as well as a factory assessment. The factory evaluation is necessary to verify if the supplier possesses the capabilities which they have documented in their tender submissions.

Table 1: Evaluation Steps for Eskom Technical Evaluation Team

Steps #	Activities for Eskom Technical Evaluation Team
1	Letter stating the minimum drums length that can be supplied (Minimum drum length for the Multimode Fibre is 500m. The Minimum drum length for the Single mode fibre is 3000m)
2	Confirm tenderer provided complete Tables A2.1, A2.2, A2.3, A2.4, A2.5
3	Confirm tenderer provided Table 2 Mandatory Criteria requirements
4	Proceed to evaluate Tenderer that meets Table 2 Mandatory Criteria
5	Conduct Desktop evaluation using Technical File of Tenderer
6	Review submission for Tables A2.3 and A2.4 and score using Table 5 for the submitted DUCT Cable
7	Review Data Sheets information submitted for the DUCT and score using Table 5.
8	Review Indexed Factory File submission and score using Table 6.
9	Consolidate Scores for Desktop evaluation from steps 6, 7 and 8 above.
10	Commercial to inform tenderer and indicate dates for Factory visits (where applicable)
11	Factory Visits by Cross-functional team (where applicable)
12	Feedback draft report to Commercial indicating which Tenderers have passed Desktop evaluation threshold.
13	Final Report completed

ESKOM COPYRIGHT PROTECTED

3.1 Mandatory Criteria evaluation

This evaluation exercise is performed by the Eskom evaluating representatives. The Eskom evaluating representatives will go through the details of the returnable submissions that are required and will ensure that the Mandatory criteria are met. Submissions that receive a “No” on any of the Mandatory criteria will not be able to proceed to the Desktop Evaluation and therefore will immediately fail the technical evaluation.

Table 2: DUCT Mandatory Criteria

DUCT Cable Mandatory Criteria	Mandatory	Comply (Yes/No)
Letter stating the minimum drums length can be supplied (Minimum drum length for the Multimode Fibre is 500m. The Minimum drum length for the Single mode fibre is 3000m)	Yes	
A/B Schedules for Single mode DUCT cables provided in English (Complete Table A2.1)	Yes	
A/B Schedules Multimode DUCT cables provided in English (Complete Table A2.2)	Yes	
State which Single Mode Cable tests are submitted, and which will be provided during Factory Evaluation. (Complete Table A2.3)	Yes	
State which Multimode Cable tests are submitted, and which will be provided during Factory Evaluation. (Complete Table A2.4)	Yes	
File of information supplied for Table A2.5 for Factory Evaluation	Yes	

3.2 Desktop Assessment

Submissions that pass the Mandatory criteria will proceed to the Desktop Evaluation.

3.2.1 Desktop DUCT Assessment

The desktop assessment will score the following items:

- DUCT cable tests reports – Both Single mode and multimode DUCT cables are required.
- Manufacturer's Data Sheets per DUCT cable that was submitted for tender.

The items will be scored as per Table 3 below:

Table 3: Scoring of items in Technical Schedules A&B

Criteria	Score
Fully compliant	3
Non-compliant (major deviation)	0

Each Tenderer will be scored for the DUCT cable submitted as indicated in Table 4.

Table 4: Desktop DUCT Evaluation

Desktop Evaluation		
DUCT Cable Scoring Criteria	Maximum Score	Threshold
24/48 Core Single Mode Duct Cable Test Report Scores	24	80% / 19.2
12 Core Single Mode Duct Cable Test Report Scores	24	80% / 19.2
Multimode 12 Core Test Report Scores	12	80% / 9.6
Cable(s) on offer datasheets submissions	3	100% / 3

Each cable offered will be assessed independently against the above stated threshold and cables score that passes the threshold score shall be considered for the tender.

3.2.2 Desktop Factory File Assessment

The Factory Information File shall be scored as per Table 5. A score of 1 point is given for every item requested. The detailed scoring in Table 6 (in section 3.3.1) will be used in the Desktop and Factory site evaluations.

Table 5: Desktop Factory File Evaluation

DUCT Cable Scoring Criteria	Maximum Score	Threshold 80%
Factory Information - File scored on answers to Table 6 on Factory information	37	29.6

The Factory information file will also be scored for Desktop evaluation and is required to pass the threshold score.

3.3 Factory Assessment

These assessments are performed to evaluate the tenderer's capability to enter a contract with Eskom with respect to a specific product or service and meet Eskom's requirements. Type tests that were indicated "FAT" in Table A2.3 and Tables A2.4 (for Desktop evaluation) shall be provided during the factory visit.

3.3.1 Scope

Eskom will conduct factory assessments to assess the ability and readiness of the tenderer to supply/manufacture fibre optic cables and/or hardware for Eskom should the need arise. Eskom assessment representative(s) will arrange visits to the factories that have qualified for factory evaluations.

In line with Covid-19 protocols, Eskom may undertake this factory assessment incorporating a virtual process. The virtual process will include a live walk-down of the entire supplier facility (offices, labs, testing facilities, manufacturing facilities, incoming and outgoing facilities, raw materials processing and hardware & software facilities) which is used to manufacture and test the fibre optic cables.

The Eskom evaluation representative(s) will conduct the assessment using Table 6 provided below. The requirements in the Desktop evaluation will be verified. If a tenderer scores less than the threshold of 80%, they will be disqualified.

Table 6: Scoring of items in Factory Evaluation

Factory Scoring Desktop & Factory Site				
Item #	Manufacturing Methods/Product Conformance	Max Score	Actual Score Desktop	Actual Score Factory
1	Factory Information: <ul style="list-style-type: none"> • Manufacturing premises address • Staff organogram • Equipment, • Testing facilities and • Plant layout 	5		
2	Ability to provide verification of all material utilised in the production of ADSS cable <ul style="list-style-type: none"> • fibre cores, • Dielectric sheath, • tube, • kevlar and • gel • rodent resistant (or similar)	5		
3	Ability to produce complete fibre product- ADSS manufacture of fibre tube <ul style="list-style-type: none"> • drawing of fibre cores into tube • addition of gel with fibre cores • setting up of machine with dielectric material and fibre tube • assembling of complete product (or similar process)	5		
4	Manufacturing to standards, licenses etc. IEC, Eskom spec etc. <ul style="list-style-type: none"> • Specs available on premises • Staff knowledge on specs • Implementation of specs 	3		
5	Design Capabilities of supplier- In house or external experts etc. <ul style="list-style-type: none"> • Personnel and • Software 	2		
6	Affiliations with any international organisation/ experts in the field.	1		
7	History and list of external customers that you have supplied similar products to.	2		
8	<ul style="list-style-type: none"> • Type of testing facilities. Calibration of equipment (major equipment calibrated accordingly), • Test capabilities (able to perform in-house sample/production tests - Test report and generic testing forms to be submitted), • Competencies of Technicians (ability to perform in-house tests), • Quality of Test reports (all relevant testing information available on test report) 	4		
9	Confirmation of Type Testing Procedures (2pt) and Facilities (2pt) (confirm that supplier has ability to type test products in accordance to SANS/IEC 60794-1-2, ISO 4892-3.	4		

ESKOM COPYRIGHT PROTECTED

10	Can provide typical packaging details of items after manufacture. • Treatment of packaging (drums), • Drum design	2		
12	Marking on drums as per Eskom requirements (NRS 088-1)	1		
13	Handling and storage requirements of product as per manufacturer.	1		
14	Verification of product length on drum	1		
15	Verification of drum gross and net weight.	1		
	Total	37	0	0
	Threshold 80%	29.6%		

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Thuli Tladi	Middle Manager: Distribution Telecommunication Operations
Thomas Jacobs	Senior Manager Technology & Engineering (Acting)

5. Revisions

Date	Rev.	Compiler	Remarks
Aug 2024	2	L Buthane	Updated evaluation table scoring thresholds
May 2024	1	L Buthane	Original document for the evaluation of the DUCT fibre optic cables

6. Development team

The following people were involved in the development of this document:

- Lesiba Buthane
- Tshepiso Moloisane
- Thuli Tladi

7. Acknowledgements

Not applicable.

Annex A – Table A2.1: Mandatory Criteria A/B Schedules Single Mode DUCT cable

DUCT A/B Schedule as per NRS 088-1					
Item	Subclause	Description		Schedule A	Schedule B
1	4.1.1	Number of fibres cores		48,24, 12	
2	4.1.1	Type of fibre		As per NRS 081	
3	4.2.2	Armouring required		No	
4	4.2.2	Type of armouring		N/A	
5	4.2.2	Single-sheath or Double-sheath		Single sheath (48/24core) & Double-sheath(12 core)	
6	4.2.2.	Glass Composite layer		Single sheath - No & Double-sheath - Yes	
7	4.2.5	Details of fibre colour coding		As in EIA/TIA 598-C	
8	4.2.6	Measures taken to prevent water ingress		Specify	
9	4.2.7	Toxicity and dermatological safety		Yes	
10	4.2.9	Cable tension for 0.2% fibre strain	N	Specify	
11	4.2.11	Crush resistance for either single or double sheath cable	N	Specify	
12	4.2.12	Bending radius of either single or double sheath cable		Specify	
13	4.2.12	Outer diameter of the cable		Specify	
14	5.2.1	Availability of type test reports.		Comply	
15	6.2.1	Wound length of cables on drum	m	Specify	
16	6.2.1	Treated wooden drum required	Yes/No	XXXXXXX	
17	6.2.6	Storage requirements		Specify	
18	6.2.7	Steel drum disposal		Specify	
19	7.1 (a)	Manufacturer data sheet number		Specify	
20	7.2	Compliance to submissions requested in 7.2		Comply	

ESKOM COPYRIGHT PROTECTED

21	7.5 (d)	Cable mass per unit length	kg/km	Specify	
22	7.6(b)	Effective group index of refraction at 1310 nm at 1550 nm		Specify	

Annex B - Table A2.2: Mandatory Criteria A/B Schedules Multimode DUCT cable

Table A2.2 Mandatory Criteria - A/B Schedule		
DUCT A/B Schedule as per Eskom 240-72274830		
Description	Schedule A Particulars of Eskom's Requirements	Schedule B Guaranteed Technical Particulars Offered
No. of Fibres	12	
Type of Fibres	OM2/OM3	
Core diameter	50µm ±6%	
Cladding diameter	125 µm ±1.0%	
Core/Cladding concentricity error	Specify	
Cladding non-circularity	Specify	
Core non-circularity	Specify	
Cladding Configuration (depressed / matched / other)	Specify	
Numerical aperture	0.2250 ± 0.02	
Attenuation Coefficient at 850 nm at 1310 nm	<2.5 dB/km <0.8 dB/km	
Normalised Modal Distortion Bandwidth at 850 nm at 1310 nm	>400 MHz.km >630 MHz.km	
Proof Test	1% elongation	
Cable Diameter (mm)	Specify	
Weight of Cable (kg/km)	Specify	
Ultimate Tensile Strength (kN)	Specify	
Maximum Short Term Load(Maximum strain less than 33 % fibre proof strain level) (kN)	Specify	
Test Load(where fibre strain does not exceed 0.2% in the fibres) (kN)	Specify	
Maximum continuous load(fibre under no strain) (kN)	Specify	
Minimum Bending Radius (mm) Metal free cable	150 mm	
Crush Resistance Metal free cable	1000N	

ESKOM COPYRIGHT PROTECTED

Impact Resistance Metal free cable	1 x 50 Nm	
Rodent Resistant	Yes	
HDD with double polyethylene sheath and glass yarn/composite layer	Yes	
Maximum Cable Length available per drum	Specify	

Annex C - Table A2.3: Mandatory Criteria Type Tests Single Mode DUCT cable

Table A3.3 Mandatory Criteria Single Mode Type Tests Required as per NRS 088-1			
Type Tests (Yes/No/FAT) Indicate which Tests have been submitted and which will be available at FAT			
		48/24 Core Single Sheath	12 Core Double Sheath
1	Longitudinal Water Penetration (SANS 60794-1-2)		
2	Sheath UV withstand (ISO 4892-3)		
3	Tensile Strength (SANS 60794-1-2)		
4	Crush Resistance (SANS 60794-1-2)		
5	Cable Bending (SANS 60794-1-2)		
6	Cable Twist (SANS 60794-1-2)		
7	Impact Resistance (SANS 60794-1-2)		
8	Temperature Cycling (SANS 60794-1-2)		
9	Compound Flow (drip) (SANS 60794-1-2)		
10	Sheave Test (SANS 60794-1-2)		

ESKOM COPYRIGHT PROTECTED

When downloaded from the WEB, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the WEB.

Annex D – Table A2.4: Mandatory Criteria Type Tests Multimode DUCT cable

Table A2.4 Mandatory Criteria Multimode Type Tests Required as per 240-72274830		
Type Tests (Yes/No/FAT) Indicate which Tests have been submitted and which will be available at FAT		
1	Tensile Strength (60794-1-E1)	
2	Crush Resistance (60794-1-E3)	
3	Impact Resistance (60794-1-E4)	
4	Temperature Cycling (IEC 60794-1-2-F1.)	

ESKOM COPYRIGHT PROTECTED

Annex E – Table A2.5: Mandatory Criteria Type Tests Multimode DUCT cable

Table A2.5 Mandatory Criteria Provide an Indexed File with answers to the following statements		
Item #	Manufacturing Methods/Product Conformance	State location in File (eg. Tab 1, Tab 2, Tab A, Tab B)
1	Factory Information: <ul style="list-style-type: none"> • Manufacturing premises address, • Staff organogram, • Equipment, • Testing facilities and • Plant layout 	
2	Ability to provide verification of all material utilised in the production of DUCT cable <ul style="list-style-type: none"> • fibre cores, • Dielectric sheath, • tube, • kevlar and • gel • rodent resistant (or similar)	
3	Ability to produce complete fibre product- DUCT <ul style="list-style-type: none"> • manufacture of fibre tube • drawing of fibre cores into tube • addition of gel with fibre cores • setting up of machine with dielectric material and fibre tube • assembling of complete product (or similar process)	
4	Manufacturing to standards, licenses etc. IEC, Eskom spec etc. <ul style="list-style-type: none"> • Specs available on premises • Staff knowledge on specs • Implementation of specs 	
5	Design Capabilities of supplier- In house or external experts etc.	

ESKOM COPYRIGHT PROTECTED

Table A2.5 Mandatory Criteria Provide an Indexed File with answers to the following statements		
Item #	Manufacturing Methods/Product Conformance	State location in File (eg. Tab 1, Tab 2, Tab A, Tab B)
	<ul style="list-style-type: none"> Personnel and Software 	
6	Affiliations with any international organisation/ experts in the field.	
7	History and list of external customers that you have supplied similar products to.	
8	Type of testing facilities. <ul style="list-style-type: none"> Calibration of equipment (major equipment calibrated accordingly), Test capabilities (able to perform in-house sample/production tests - Test report and generic testing forms to be submitted), Competencies of Technicians (ability to perform in-house tests), Quality of Test reports (all relevant testing information available on test report) 	
9	Confirmation of Type Testing Procedures (2pt) and Facilities (2pt) (confirm that supplier has ability to type test products in accordance to SANS/IEC 60794-1-2, ISO 4892-3.	
10	Can provide typical packaging details of items after manufacture. <ul style="list-style-type: none"> Treatment of packaging (drums), Drum design 	
11	Marking on drums as per Eskom requirements (NRS 088-1)	
12	Handling and storage requirements of product as per manufacturer.	
13	Verification of product length on drum	
14	Verification of drum gross and net weight.	