REQUEST FOR QUOTATION



MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED

Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 **INDIA**

RFQ NUMBER: VVSOT00003

> RFO DATE: 20.03.2023

Due Date/Day: 31.03.2023 FRI : 13:00 HRS Tender Box : Reception Area

Opening Venue: SUB ASSLY PUR

(address for communication):

(for all correspondence) Purchase Executive: VVS Neeraja

Phone: 080 26989018

E-mail: neerajavvs@bhel.in

			· ·	1	1
Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	DV0688172869 FIBER OPTIC CABLE ASSEMBLY ST- ST, 540MM * HSN/SAC : 8544 Mfr Part No 85009737 Vendor - HUBER+SUHNER ELECTRONICS PVT. LTD. Mfr Part No FOC-102029 Vendor - SIMAC TECHNIEK NV Test Certificate FIBER OPTIC CABLE ASSEMBLY 200/230uM, ST-ST,540mm. BHEL specification: PS4062348 Item No.3	5,760	NO	5,760	30.06.2023
2	DV0688172877 FIBER OPTIC CABLE ASSEMBLY ST- ST, 700MM * HSN/SAC: 8544 Mfr Part No 85009738 Vendor - HUBER+SUHNER ELECTRONICS PVT. LTD. Mfr Part No FOC-102030 Vendor - SIMAC TECHNIEK NV Test Certificate FIBER OPTIC CABLE ASSEMBLY 200/230uM,ST-ST,700mm. BHEL specification: PS4062348 Item No.5	7,200	NO	7,200	30.06.2023
Total	Number of Items - 2			<u> </u>	
1. 2.					

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:

- 1. This RFQ is governed by:
- a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at http://edn.bhel.com (RFQ-PO Terms & Conditions)
- b) Any other specific Terms and Conditions mentioned.
- 2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
- * The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

VVS Neeraja Sub-Assembly

1 OF 1



PRE - QUALIFICATION CRITERIA FOR FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST GROUP: SUB ASSEMBLY ENGG

406/PQC/FOC REV NO **01**

	EDN B	ANGALORE	GROUP: SUB AS	SEMBLY ENGG	2	PAGE 01 OF 01
		PRE-Q	UALIFICATION CRITERIA	(PQC)		
4	A	A General			COMPLIED	
		or aut	idder shall be an Original Equiphorized by the OEM (to be suprization from OEM for supplied	ported with valid	er (OEM)	Yes / No
			EM shall be a fiber optic cable trial application.	assembly manufac	turer for	Yes / No
ı. ompany.			shall be for new fiber optic cab y used or refurbished material	ole assembly only as	nd not	Yes / No
electricals Limited ie interest of the c		4. Vendors who are already developed and evaluated for regular supply of these Fiber optic cable assembly 200/230μm ST-ST to BHEL for usage in Traction IGBT power modules shall quote for the same item as per their approved part numbers.			Yes / No / NA	
arat Heavy E imental to th			ors whose samples are under tri BHEL shall not be eligible for	Yes / No / NA		
n anyway detr		BHEI	5b. New vendor (with no prior supply history of this material to BHEL-EDN) shall not be eligible for this tender. They will be considered for development order as per the details below.			
The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.	В	New v for tec indep	for placing Development Ordendors shall be considered for chnical evaluation and subsequendent of this tender, provided etitive price. They shall supply BHEL purchase specification	separate developme ent field trials whic the material is offer fiber optic cable as	ent orders h is red at a	Yes / No / NA
I the II						
				APPROVED BY: SUD	A	r
				PREPARED BY GIRISH T J	ISSUED BY SAE/406	DATE 16.03.2023

	बीएर	र इंसम	PURCHASE	SPECIFICATION FO	R	PS4062348
	H	FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST			REV NO 01	
	EDN BANGALORE					PAGE 00 OF 07
It must not		SF	PECIFICATON FOR FIBER OPT	TIC CABLE ASSEMBI	LY 200/230μm ST-S	Γ
It It			REVISI	ON HISTORY SHEET		
-	e y		IL VISI	ON THE TORT STILL		
the company	Rev No	Date	Nature of Change	Reasons	Prepared By	Approved By
imited.	00	19.01.2023	FIRST ISSUE		Hari Kallu	ru Girish T J
Electricals Lalto the inter	01	15.03.2023	Updation	Type test deta	ails k. Hari Kallu	ru Girish T J
on this document is the property of Bharat Heavy Electricals Limited. be used directly or indirectly in anyway detrimental to the interest of the company.						
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				Approved T J Girish	: Lin	
				Prepared:	Issued:	Date:
				The same of the sa	4.4	1.1

1370010/2023/EDN-SA/ENGG PS4062348 **PURCHASE SPECIFICATION FOR** REV NO 01 FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST PAGE 01 OF 07 **Brief description:** Fiber optic cable assembly to be prepared by using simplex multimode step index (200/230μm) fiber optic cable of required length terminated with ST connectors on both sides as per standard procedure required to be used in Traction applications. Scope of Supply: Fiber Optic cable assembly of required length (as per table-1) having ST bayonet type connectors at both The information It must not ends having protective cap meeting the technical specifications given in the document. 1. Detailed specification: A. Fiber optic cable: Simplex Multimode step index Glass fiber cable (200/230μm) on this document is the property of Bharat Heavy Electricals Limited. be used directly or indirectly in anyway detrimental to the interest of the company. Fiber cable with 200/230μm core/cladding, 500 μm buffer layer surrounded with aramid yarn, protected with a jacket material. 1. Diameter of the core glass : 200 ±5 µm : 230 µm (Nominal) 2. Diameter of the cladding 3. Coating diameter : 500 μm (Nominal) 4. Cladding Eccentricity error $: < 5 \mu m$ COPY RIGHT AND CONFIDENTIAL 5. Bandwidth ($\lambda = 850$ nm) : >20 MHz / Km 6. Numerical aperture : 0.37 (Nominal) $: -65^{\circ}C \text{ to } +125^{\circ}C$ 7. Fiber Temperature range 8. Attenuation ($\lambda = 850$ nm) at 20 $^{\circ}$ C $: \le 8 \text{ dB/km (typ.)}$ -40°C to +85°C : ≤ 1db/50m 9. Material : Hard Clad Silica 10. Strain relief : Aramide yarn 11. Outer Jacket material : PUR, flame retardant / LSFH / LSZH polymers 12. Cable diameter : 2.6 mm +0.4 / -0.2 mm

13. Outer Jacket colour

14. Min. Bending Radius

: Orange

: 25mm

1370010/2023/EDN-SA/ENGG

PURCHASE SPECIFICATION FOR

FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST

PS4062348

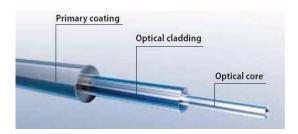
REV NO 01

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HCS FIBER

ARAMID YARN

OUTER SHEATH



Fiber optic cable

HCS FIBER

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B. Connectors:

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1. Connectors : ST connector with Bayonet fastener suitable for railway application

2. Insertion loss : < 1.5 db/way (max) for 200/230 um HCS fiber

3. Mechanical life : > 500 mating cycles

4. Bayonet : Metal (Brass nickel plated)
5. Ferrule : Ceramic/Zirconia / Metal

6. Boot Colour : Black

C. Service conditions:

1. Operating Temperature : -40°C to +85°C

2. Humidity : 100% during rainy season3. Rain fall : Very heavy in certain areas.

4. Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas.

2. Standards for reference:

IEC 60794-1 Optical fiber cables - Generic specification - General

IEC 60794-2 Optical fiber cables - Indoor cables

IEC 60794-3 Optical fiber cables - Outdoor cables

IEC-60874-1 Fiber optic interconnecting devices and passive components

IEC 60793-2-30 Sectional specification for category A3 multimode fibres

Reference: CLW specification No. CLW/ES/3/0141

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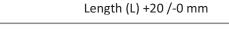
EDN BANGALORE

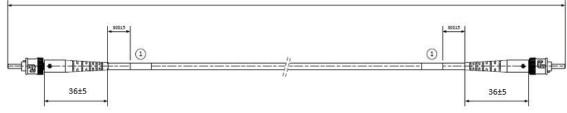
PURCHASE SPECIFICATION FOR

FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST

PS4062348 REV NO 01 PAGE 03 OF 07

3. Cable assembly Dimensional details:







Pos	Part Description	
1	1 Marking label with make and part number	
	details (one side / both sides)	
2	Strain relief boot	
3	Dust cap	

Fig-1: Fiber optic cable with connectors

Item. No	Description	Length (L)
1	Fiber optic cable assembly 200µM ST-ST 210MM	210mm
2	Fiber optic cable assembly 200µM ST-ST 450MM	450mm
3	Fiber optic cable assembly 200µM ST-ST 540MM	540mm
4	Fiber optic cable assembly 200µM ST-ST 560MM	560mm
5	Fiber optic cable assembly 200µM ST-ST 700MM	700mm
6	Fiber optic cable assembly 200µM ST-ST 800MM	800mm

Table-1: Cable assembly length details

Marking on cable:

The following information shall be printed on cable

Name of the Manufacturer/ Monogram / Identification number

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)/2023/	EDN- <mark>SA/EN</mark> GG	PURCHASE SPECIFICATION FOR	PS4062348
	HHEL	FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST	REV NO 01
	EDN BANGALORE	TIBER OF THE CABLE ASSERTED T 2007 250 pm 31 31	PAGE 04 OF 0
	1	oly Attenuation: Insertion loss ≤ 1.5 dB for cable assembly liste	ed in Table-1 as per I
	5. Type Tests (During	ertion method). development): are to be conducted by the vendor for cable assembly of suitab	pla langth as par rak
The information It must not	IEC standard in the pr	resence of BHEL representative / government approved labs / be submitted to BHEL.	
The ii	Visual inspection and each type test.	cable attenuation test (Insertion loss \leq 1.8 dB at 10m length)	to be performed aft
company.	Details of the fiber, ja report.	cket material and connectors used in the assembly shall be in	dicated in the Type
DENTIAL of Bharat Heavy Electricals Limited. anyway detrimental to the interest of the company.	Note: Vendor is requi connectors, jacket ma	ired to repeat type tests in case of any change in BOM of cab aterial)	le assembly (fiber,
ctricals o the in	5.1 Vibration Tes	st	
avy Ele nental t	5.2 Cyclic flexing	test	
AL arat He y detrin	5.3 Bending cond	duct	
DENTIAL y of Bharat t anyway de	5.4 Crush Test		
CONFI propert ectly in	5.5 Long term st	ability test	
AND or indii	5.6 Socket Impac	ct test FST	
RIGHT locumer directly	5.7 Halogen con	tent of combustion gases	
COPY RIGHT AND CONFID on this document is the property be used directly or indirectly in a	5.8 Level of fume	es and toxicity	
	5.9 Inflammabili	ty	
	5.10 Temperatui	re Strain	
	5.11 Cable diam	eter	
	5.12 Rotation me	otion	
	5.13 Humidity		
1	I .		

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FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST

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Type test procedure in brief given below, refer relevant standards for detailed procedure.

5.1 Vibration Test:

EDN BANGALORE

Test standard: IEC 60571 and IEC 88-2-8

Free oscillating Length2 50mm from connector with rear boot horizontally clamped.

Directions : 2

Frequency range : 1 to 100 Hz Displacement : \leq 15mm Acceleration : \leq 5 g(gravity)

5.2 Cyclic Flexing Test:

Test standard : IEC 60794-1-E8
Temperature : Room temperature

Flexing Speed : 30 flexing cycles per minute

Load : 10N clamped to the cable covering

Number of cycles : ≥10000 Bending radius : 25mm Bending arm length : 150mm

5.3 Bending Conduct:

Test standard : IEC 60794-1-E6 Temperature : Room temperature

Flexing Speed : 10 flexing cycles per minute

Load resistance : 40N clamped to the cable covering

Number of cycles : ≥10000 Bending radius : 30mm

5.4 Crush Tester:

Test standard : IEC 60794-1-E3
Temperature : Room temperature

Load duration : >2 minutes prior to measurements

Surface Weight : 1800N/cm

5.5 Long term stability Test:

Test standard : IEC 60874-1, Method 8

Temperature : (-40 to +85°C)

Number of cycles : ≥500

Bending radius : 25mm

Duration : 15 minutes

Tension at the plug : 20 N

5.6 Socket impact test:

Experimental setup: 2 connectors are plugged into a ST-Coupler. The connectors are pulled back to their end stops and released so that their end faces hit one another with maximum force. After every impact the damping is measured

Cycles: 100

Analysis: Every 10 impacts, mean values are taken. The difference between the last mean value and the first one is decisive.

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FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST

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5.7 Halogen content of combustion gases:

Qualitative detection of halogens in accordance with the Beilstein Test / relevant IEC standard.

Test standard: SEV TP 20B/3A figure 344.1- No green colouring of the flamel.

If a positive reaction occurs, the qualitative analysis, according to DIN 53474, method 7,1, is carried out. The maximum permitted halogen content must not exceed 0.1%.

5.8 Level of fumes and toxicity:

Test standard: NF F 16-101, class F 3, UITP E-4 / relevant IEC standard

5.9 Inflammability:

Test standard: NF F 16-101, class D / relevant IEC standard

5.10 Temperature strain:

Temperature : -40 to +90°C Number of cycles : >500 Duration : 10 Minutes

5.11 Cable diameter:

Outer Diameter: 2.6mm +0.4/- 0.2mm

5.12 Rotation motion:

Test standard : IEC 60874-1, Method 6
Temperature : Room temperature

Number of cycles : 500Turning angle : 90 °C

Rotating speed : 10 turning motions per minute

5.13 Humidity Test:

Test standard : IEC 60874-1, Method 29.4

Temperature : 70°C

Duration : 10 days

Humidity : 90%

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	###EL	FIBER OPTIC CABLE ASSEMBLY 200/230µm ST-ST	REV NO 01			
	EDN BANGALORE	TIBER OF THE GABLE ASSEMBLY 2007 200 pm of 01	PAGE 07 OF			
	6. Packing:					
	· · · · · · · · · · · · · · · · · · ·	ssembly are packed in coils. It is permissible to pack the coils ations. A packing list shows the content of each packing unit.				
	The protective caps m	nust be placed on the tips on the ST connectors.				
ation it not	1	ed in a manner suitable for delivery and storage. Transport pagainst accidental damage during handling.	ackaging shall prov			
The information It must not	7. Tender documents:	:				
The	7.1 Approved vendor shall quote for the part number already approved.					
pany.	7.2 Development orde	er vendors:				
he com	7.2.1 Shall agree to	conduct type tests as per Cl. 5 and submit test reports durin	ng development or			
imited.	(for evaluation	on and field trial).				
icals L	7.2.2 If new vendo	or already conducted above type tests, they will be eligible fo	r development ord			
/ Electr ital to th	and can mak	ke supplies for evaluation and field trial.				
ENTIAL of Bharat Heavy Electricals Limited. unyway detrimental to the interest of the company.	8. Acceptance criteria	:				
FIDENTIAL erty of Bharat in anyway de	8.1 Approved vendors Attenuation.	shall submit routine test report for confirming dimension an	d cable assembly			
CON.	8.2 Development vend	dors shall submit below documents for evaluation:				
COPY RIGHT AND CONFIDE: on this document is the property of be used directly or indirectly in any		hich includes details as in cl.1 for fiber optic cable and assem port for the fiber geometry and type test reports.	bly.			

---- END----

RFQ TERMS & CONDITION

Following points are to be noted before submitting your offer.

- 1- Important Notice: Request you to go through terms and conditions before submitting quote.
- a) INSTRUCTIONS TO BIDDERS/SELLERS (**Doc No :BHEL:EDN:ITB-SHOP: Rev 03**) available at http://edn.bhel.com (RFQ-PO Terms & Conditions)
- b) GENERAL CONDITIONS OF CONTRACT FOR PURCHASE (**Doc no: BHEL: EDN: GCC-SHOP: Rev 01**) available at http://edn.bhel.com (RFQ-PO Terms & Conditions)
- c) Any other specific Terms and Conditions mentioned.
- d) FOR THIS PROCUREMENT, PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), Order 2017 dated 15.06.2017, 28.05.2018 and revision dated 16th September 2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/or local content in respect of this procurement, same shall be applicable. https://dipp.gov.in/public-procurements

e) **FOR THIS PROCUREMENT (GFR),** Restrictions under Rule 144(xi) of the General Financial Rules (GFRs), 2017- Dept. of Expenditure OM No.6/18/2019-PPD dated 23rd July, 2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO against this NIT.

https://www.mea.gov.in/

f) PURCHASE PREFERENCE FOR MSE VENDORS:

MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided: -

- i. The MSE vendor matches the L1 price.
- ii. L1 price is from a non MSE vendor.
- iii. L1 price will be offered to the vendor nearest to L1 in terms of price ranking (L2 nearest to L1). In case of non-acceptance by the MSE vendor (L2), next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
- iv. 3% of the 25% will be earmarked for women owned MSEs.
- v. 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (i) & (ii) are fulfilled.
- vi. In case where no SC/ST category firms are meeting the conditions mentioned in (i) and (ii) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender.

- vii. In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items/quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc., then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1. Such information that tendered quantity will not be split shall be indicated in the RFQ.
- 2- Bidders should mention GSTN number of the place of supply and HSN (Harmonized System of Nomenclature)/SAC (Services Accounting Code) number in the offer. In case both supply and service are involved, GSTN no of the place of supply for services shall also be mentioned separately in the offer if different.
- 3- This is TWO PART BID tender. BIDDERS are requested to send "Techno Commercial Bid" AND "Price BID" separately. For more details, please refer point 2.b in attached RFQ Terms and conditions document
- 4- Penalty for delayed delivery is applicable for this Enquiry. If it is not mentioned explicitly it will be assumed as acceptance.
- 5- Offers with ADVANCE PAYMENT are liable for rejection
- 6- If only "Sight Draft" is mentioned it will be considered as "Sight Draft with 45 days"
- 7- In case of not interested in submitting quotation, please send the regret letter which is essential for our records.
- 8- Please indicate complete part number in your quotation and make, else your quotation might be rejected.
- 9- Please quote for our RFQ quantity and for MOQ (if any). Offers with high MOQ may not be accepted.
- 10- Material has to be supplied in manufacturer's pack in sealed condition (Refurbished/ pulled out parts are not accepted).
- 11- Supplier should quote online. Quotation received in hardcopy will not be considered.
- 12- If we find different prices for the same Mat Code (after opening Price BID), we will consider the Lowest price only (out of all different prices) for the entire quantity.

13-Reverse Auction is Not applicable for this tender.
END
-

14. For all correspondence, contact

Ms. V.V.S.Neeraja, Phone: 080 26989018 Email: neerajavvs@bhel.in

Tender Terms - Conflict of interest

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (s) in common; or
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or
- c) they have the same legal representative/agent for purposes of this bid; or
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, · or
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. one bidding manufacturer in more than one bid; or
- f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following:
- 1. The principal manufacturer directly or through one Indian agent on his behalf; and
- 2. Indian/foreign agent on behalf of only one principal, or
- g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, \cdot or
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/common business/management units in same/similar line of business. "

On Bidder Letter Head

	Date:
То,	
M/s Bharat Heavy Electricals Ltd. Electronics Division, Mysore Road,' Bangalore – 560026	
Sub: Model Clause / Certificate as per Annex-III (Tenders) of Restrictions Under R General Financial Rules (GFRs) 2017, Dated 23.07.2020.	ule 144 (xi) of the
Ref: BHEL Tender / RFQ / NIT Number	
I	ame] have read the nares a land border with or Name & address] is t the other one], has all requirements in this
For M/s	
Authorized Signatory (with company seal & Name)	

On Bidder Letter Head

Date:
To,
M/s Bharat Heavy Electricals Ltd. Electronics Division, Mysore Road,' Bangalore – 560026
Sub: Model Clause / Certificate as per clause 9 (a) of Revised Public Procurement (Preference to Make i India Order, 2017 of DPIIT dated 13.06.2020.
Ref: BHEL Tender / RFQ / NIT Number
I
For M/s
Authorized Signatory (with company seal & Name)