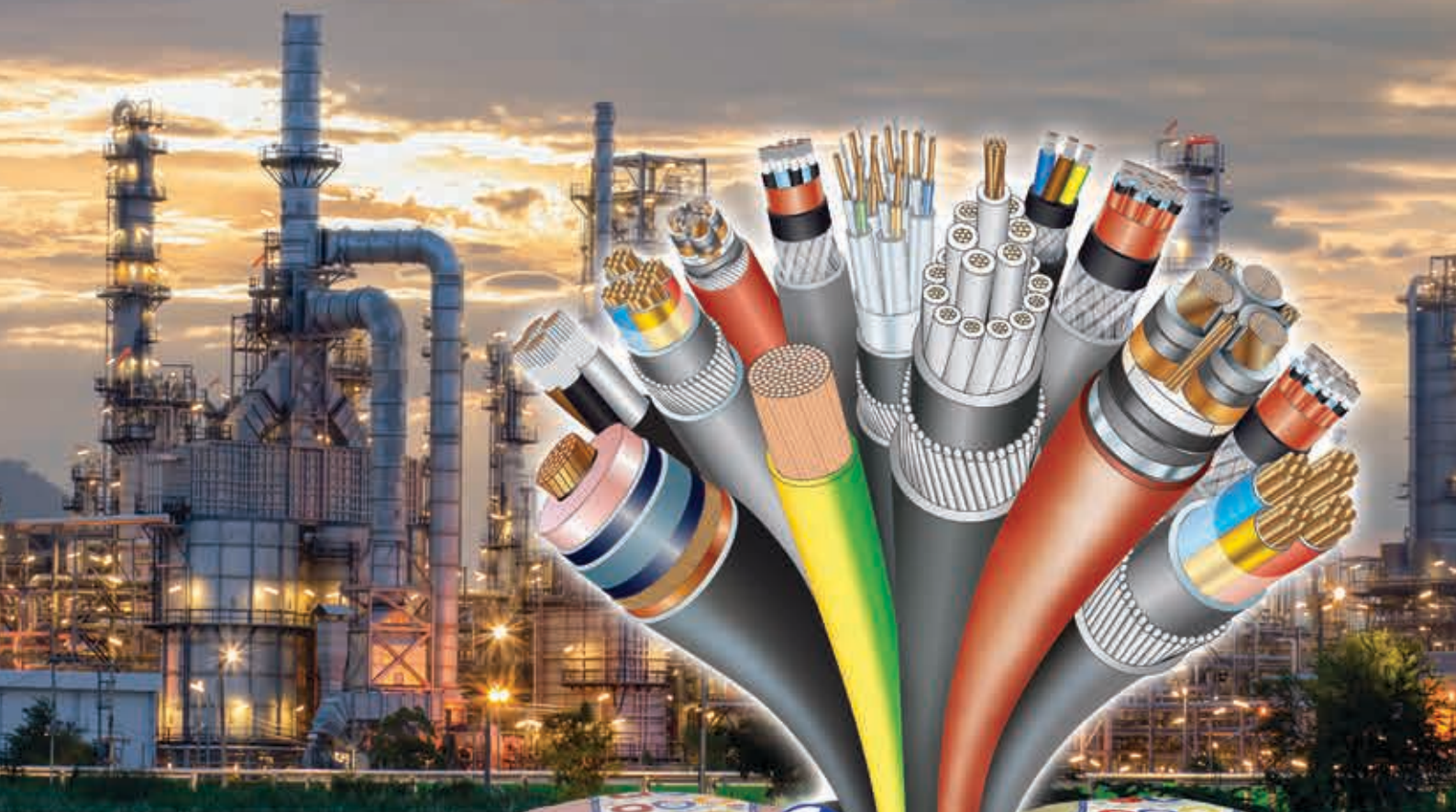


MULTI LAYER (AL-HDPE-PA) SHEATH



NUHAS OMAN
CABLES & WIRES

QUALITY & RELIABILITY



NUHAS OMAN - SPECIALITY WIRES & CABLES



شركة نحاس عمان - الأسلاك والكابلات المتخصصة

COMPANY PROFILE

Nuhas Oman LLC, a member of the Al-Bahja Group of Companies, is an ISO 9001:2015 BASEC, UK certified integrated quality producer of LV and MV Cables, Wires & Conductors and Oxygen Free High Conductivity Continuous Cast Copper Rods in the Sultanate of Oman.

Nuhas is also certified to ISO 14001:2015 and ISO 45001:2018 by Bureau Veritas, Oman for HSE management system.

Our current capabilities are:

1. World-class Speciality Insulated Wires and Cables manufactured in state of art facility.
2. Oxygen Free High Conductivity Continuous Copper rod produced by UPCAST® System.
3. Nuhas Oman offers wide range of Cables :
 - Medium Voltage cables up to 33 kV
 - Low Voltage cables
 - Power & Control Cables
 - Instrumentation Cables
 - Flexible cords and Building wires
 - LPCB approved Fire Resistant Cables
 - LPCB approved Fire Alarm Cables
 - Offshore & Shipboard Cables
 - Multi layer sheathed chemical resistant Cables

Our product range meet the requirements of a broad spectrum of applications including - Industrial, Power & Control, Petrochemical, Oil & Gas, Ship Building and Offshore Platforms, Building & Construction, Hospitals, Hotels, Entertainment & Security etc. Nuhas Oman Cables are type test approved by BSI,U.K; KEMA,Netherlands; DEKRA,VDE,UL,LPCB & DNV-GL complying with relevant international BS & IEC Specifications. Our Cables are approved by various utilities, large corporates and global consultants such as Distribution Code Review Panel (DCRP),Oman; NAMA Holding (Mazoon,MEDC,Majan,Tanweer,DPC), Ministry of Electricity & Water,JSRS, Petroleum Development Oman (PDO), Oman Oil Refineries Petroleum Industries Company (ORPIC),Duqm Refinery, Daleel Petroleum,Oman Oil Company,Oman LNG, Oman Gas Company, Ministry of Transport, Ministry of Communications, Ministry of Defence, Royal Oman Police (ROP), Royal Court Affairs (RCA), Ministry of Health, Special Economic Zone Authority Duqm (SEZAD), Muscat Municipality, Occidental (Oxy), BP, Shell, Petrofac, Atkins, Parsons, Worley Parsons, SSH, Khatib and Alami, Mott MacDonald, Renardet etc.

Abu Dhabi Water & Electricity Authority (ADWEA), Abu Dhabi National Oil Company (ADNOC), Qatar General Electricity & Water Authority (Kahramaa), Qatar Civil Defense, Kuwait National Petroleum Company (KNPC), Electricity Distribution Directorate, Kingdom of Bahrain, Ministry of Electricity & Water authority,Kuwait; Saudi Electricity Company, KEO International, Arab Engineering Bureau, COWI etc.

New product development is a continuing activity at Nuhas Oman.

Nuhas is the first producer in the Middle East to have been certified by DNV-GL,Norway capable of manufacturing power, control and instrumentation cables for shipboard,high speed/light craft and off-shore applications. Nuhas Oman manufactures FRC 500 Fire Resistant LV cables and FRC 300 Fire Alarm screened cables which are type approved by LPCB, UK. Nuhas Oman also offers Power, Control & Instrumentation Cables with multilayer (AL-HDPE-PA) sheath as an alternative to Lead sheathed cables for better chemical protection mainly used in Petrochemical industry.

Nuhas is committed to deliver quality products that conform to relevant International standards. Our quality cycle commences from the time of sourcing of raw materials and consumables, in-process production controls and certification of finished goods prior to delivery. A well-equipped in-house quality assurance facility ensures that all products delivered meet stringent quality controls and parameters. Our state-of-the-art laboratory is equipped for testing as per required standards as well as individual customer specifications.

Our production and quality management systems are manned by a team of experienced professionals backed with relevant industry experience. Nuhas Oman is committed to excellence in the management of health, safety, environment and labor practices. We are committed to promoting and protecting the welfare of our employees through "Safety First" work practices and providing a healthy workplace. Nuhas Oman also ensures compliance with the laws and regulations of the land. Nuhas Oman endeavors to be a responsible corporate citizen and fulfills its responsibilities through its Corporate Social Responsibility initiatives. Our global client base extending from Far East Asia, Indian sub-continent, the GCC, Africa to Europe is testimony to customer confidence and satisfaction. The company is committed to meet the challenges of the Domestic & Global markets for supply of world class Cables & Wires, while maintaining the sanctity of our pristine environment.



MULTI LAYER (AL-HDPE-PA) SHEATH

INTRODUCTION:

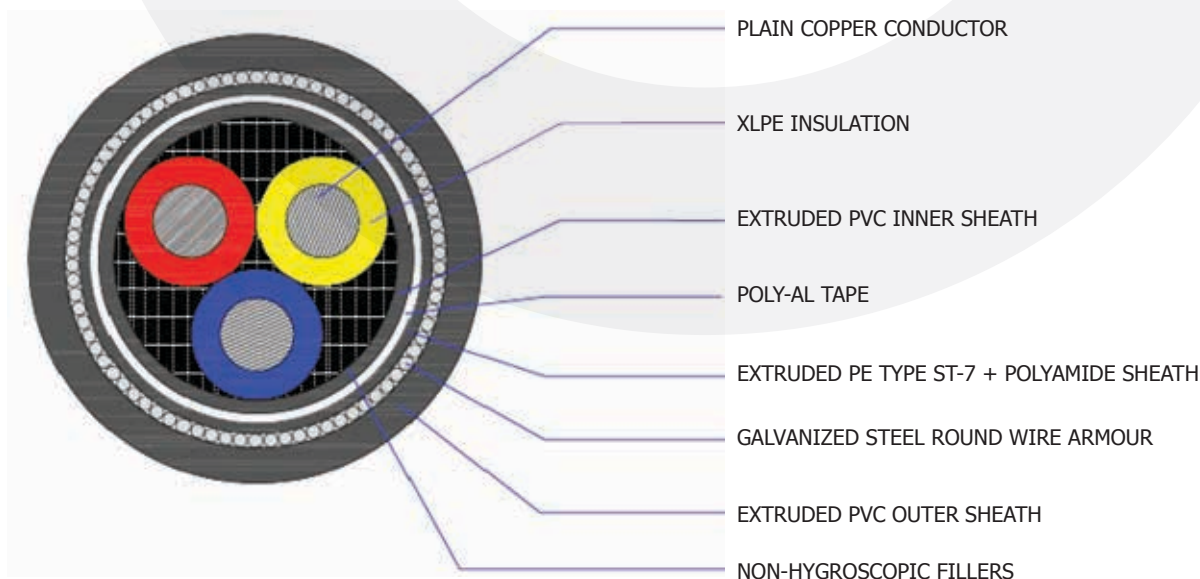
- Lead has been traditionally used as a protection against hydrocarbons, oils and oxidising acids in petrochemical industries. However, there are some inherent disadvantages with lead sheath as given below.
- 1. Lead is a heavy but soft metal, which makes the lead sheathed cables very heavy making them costly to handle, install etc.
- 2. There are serious environmental concerns regarding lead in underground cables as it can cause lead poisoning. Many countries are phasing out or have already forbidden use of lead in underground cables.

TECHNICAL FEATURES:

- An alternative to lead sheath is a triple layer sheath comprising
 - a) A longitudinal laminated aluminium foil bonded with
 - b) Extruded Polyethylene (HDPE) layer and
 - c) Extruded Polyamide layer
- The above alternative has the same functionality as the lead sheath. The laminated Aluminium tape layer prevents ingress of water. The PE sheath provides the resistance to inorganic chemicals such as acids, bases, inorganic salts and the PA layer acts as a barrier against organic materials such as aliphatic and aromatic hydrocarbons, petrol, oil etc. The combinations of these three sheaths are an adequate alternative to lead sheaths for a large number of applications.
- Additionally, the Al+PE+PA sheath makes the cables lighter in weight and of reduced diameter making it easier to transport, handle and install.
- Production of cables with triple layer sheath requires careful processing requiring special compounds, additives and suitable production equipment. Nuhas Oman has carried extensive trials and successfully produced cables with multi-layer extruded sheath. Nuhas Oman has successfully supplied substantial quantities to Oil & Gas sector.
- Nuhas Oman Multi-layer sheathed (AL-HDPE-PA) cable has been tested by BASEC, an ISO 17025 accredited cable test laboratory for resistance to various fluids which are representative of the worst possible combination of solvents likely to be encountered in cable applications as per BS EN 50289-4-4.
- Comply the most stringent flame retardant test of IEC 60332-3-22 (CategoryA).
- May also be made fire resistant type complying IEC 60331 or BS 6387 CWZ with fire barrier tape wrapped overconductor.

CROSS SECTIONAL DRAWING:

CROSS SECTIONAL DRAWING OF 3CORE LV POWER CABLE AS PER IEC:60502-1





LOW VOLTAGE MULTI LAYER SHEATHED ARMoured CABLES FOR CHEMICAL PROTECTION POWER CABLE - CU/XLPE/PVC/AL-HDPE-PA/SWA/PVC

Reference standards:	IEC 60502-1	Voltage: 600/1000 V
Construction:	<ol style="list-style-type: none"> 1) Oxygen Free Electronic Copper Conductor 2) XLPE Insulation 3) PVC Bedding 4) Longitudinal overlapped Aluminium foil with extruded layer of HDPE & Polyamide (Nylon) covered multi layer sheath 5) Galvanized steel wire armour for multicore & aluminium wire for single core cables 6) PVC sheath 	Max. Operating temperature: 90°C

Conductor Size		Thickness of Insulation	Thickness of Multi layer Sheath	Armour wire Diameter	Nominal Thickness of Oversight	Approximate Overall Diameter	Approximate Cable Weight
mm		mm	mm	mm	mm	mm	kg/km
Single Core	50	1.0	1.2	1.6	1.6	21.9	900
	70	1.1	1.2	1.6	1.6	23.7	1130
	95	1.1	1.2	1.6	1.7	25.6	1430
	120	1.2	1.3	1.6	1.7	27.5	1720
	150	1.4	1.3	1.6	1.8	29.8	2050
	185	1.6	1.4	1.6	1.9	32.0	2450
	240	1.7	1.5	1.6	2.0	35.0	3060
	300	1.8	1.5	2.0	2.1	38.4	3780
	400	2.0	1.6	2.0	2.2	42.3	4710
	500	2.2	1.7	2.0	2.3	46.1	5850
Two Core	630	2.4	1.8	2.5	2.5	51.8	7470
	1.5	0.7	1.2	0.9	1.8	16.8	490
	2.5	0.7	1.2	0.9	1.8	17.6	530
	4	0.7	1.2	1.25	1.8	19.3	700
	6	0.7	1.2	1.25	1.8	20.5	800
	10	0.7	1.2	1.25	1.8	22.5	930
	16	0.7	1.2	1.25	1.8	24.1	1100
	25	0.9	1.2	1.6	1.8	25.6	1430
	35	0.9	1.2	1.6	1.8	28.0	1720
	50	1.0	1.2	1.6	1.9	28.8	1990
	70	1.1	1.3	2.0	2.1	32.9	2750
	95	1.1	1.4	2.0	2.2	36.0	3430
	120	1.2	1.5	2.0	2.3	38.6	4040
	150	1.4	1.7	2.5	2.5	51.8	5960
	185	1.6	1.8	2.5	2.6	56.0	6990
	240	1.7	2.0	2.5	2.8	62.0	8600
300	1.8	2.0	2.5	3.0	58.4	9120	
400	2.0	2.2	2.5	3.2	64.2	11120	
Three Core	1.5	0.7	1.2	0.9	1.8	17.3	510
	2.5	0.7	1.2	1.25	1.8	18.9	670
	4	0.7	1.2	1.25	1.8	20.0	760
	6	0.7	1.2	1.25	1.8	21.2	880
	10	0.7	1.2	1.25	1.8	23.4	1060
	16	0.7	1.2	1.6	1.8	25.8	1430
	25	0.9	1.2	1.6	1.8	27.6	1770
	35	0.9	1.2	1.6	1.9	29.4	2120
	50	1.0	1.3	1.6	2.0	32.0	2600



LOW VOLTAGE MULTI LAYER SHEATHED ARMOURED CABLES FOR CHEMICAL PROTECTION POWER CABLE - CU/XLPE/PVC/AL-HDPE-PA/SWA/PVC

Reference standards:	IEC 60502-1	Voltage: 600/1000 V
Construction:	1) Oxygen free Electronic Copper Conductor 2) XLPE Insulation 3) PVC Bedding 4) Longitudinal overlapped Aluminium foil with extruded layer of HDPE & Polyamide (Nylon) covered multi layer sheath 5) Galvanized steel wire armour for multicore & aluminium wire for single core cables 6) PVC sheath	Max. Operating temperature: 90°C

Conductor Size	Thickness of Insulation	Thickness of Multi Layer Sheath	Armour wire Diameter	Nom Thickness of Oversheath	Approximate overall Diameter	Approximate Cable Weight	
mm	mm	mm	mm	mm	mm	kg/km	
Three Core	70	1.1	1.4	2.0	2.1	36.8	3630
	95	1.1	1.5	2.0	2.3	40.3	4550
	120	1.2	1.6	2.5	2.4	45.3	5830
	150	1.4	1.7	2.5	2.6	49.7	6960
	185	1.6	1.8	2.5	2.7	52.6	8150
	240	1.7	2.0	2.5	2.9	59.5	10270
	300	1.8	2.1	2.5	3.1	65.4	12400
Four Core	400	2.0	2.4	3.15	3.4	71.9	15870
	1.5	0.7	1.2	0.9	1.8	18.0	560
	2.5	0.7	1.2	1.25	1.8	19.8	740
	4	0.7	1.2	1.25	1.8	21.0	850
	6	0.7	1.2	1.25	1.8	22.4	990
	10	0.7	1.2	1.6	1.8	25.5	1350
	16	0.7	1.2	1.6	1.8	27.4	1660
	25	0.9	1.2	1.6	1.9	29.7	2110
	35	0.9	1.2	1.6	1.9	32.0	2570
	50	1.0	1.4	2.0	2.1	35.9	3430
	70	1.1	1.5	2.0	2.3	41.0	4530
	95	1.1	1.6	2.5	2.4	45.7	6050
	120	1.2	1.7	2.5	2.6	51.5	7400
	150	1.4	1.8	2.5	2.7	55.1	8720
	185	1.6	2.0	2.5	2.9	60.4	10430
	240	1.7	2.2	2.5	3.1	68.1	13150
300	1.8	2.3	3.15	3.4	75.4	16640	
400	2.0	2.6	3.15	3.7	84.3	20600	
Five Core	1.5	0.7	1.2	1.25	1.8	19.6	710
	2.5	0.7	1.2	1.25	1.8	20.7	810
	4	0.7	1.2	1.25	1.8	22.1	950
	6	0.7	1.2	1.25	1.8	23.7	1110
	10	0.7	1.2	1.6	1.8	27.0	1520
	16	0.7	1.2	1.6	1.8	29.1	1910
	25	0.9	1.3	1.6	1.9	33.6	2590
	35	0.9	1.4	2.0	2.1	37.7	3440
	50	1.0	1.5	2.0	2.2	42.3	4370
	70	1.1	1.7	2.5	2.4	48.9	6080

Note : Above cables can also be manufactured & supplied with fire resistant type/LSOH on request



LOW VOLTAGE MULTI LAYER SHEATHED ARMoured CABLES FOR CHEMICAL PROTECTION Instrumentation Cable - Individual & Overall Screened

Reference standards: Construction:	BS 50288-7:2005 1) Oxygen Free Electronic Copper Conductor Class 1 & 2 2) XLPE Insulation 3) Individual pair screen with Aluminium Mylar Tape & Tinned Copper drain wire 4) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 5) PVC Bedding 6) Longitudinal overlapped Aluminium foil with extruded layer of HDPE & Polyamide (Nylon) covered multi layer sheath 7) Galvanized steel wire Armour 8) PVC Outer sheathing	Voltage: 300/500 V Max. Operating temperature: 90°C
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Conductor Size	Number of Pairs	Thickness of Multi Layer Sheath	Size of Armour Wire	Thickness of Sheath	Approximate Overall Diameter	Approximate Cable Weight
mm ²	no.	mm	mm	mm	mm	kg/km
0.5 (1/0.8)	2	1.1	0.9	1.5	18.0	520
	5	1.2	0.9	1.5	21.0	700
	10	1.4	1.25	1.7	27.5	1200
	20	1.5	1.25	1.8	33.0	1700
0.75 (1/0.98)	2	1.1	0.9	1.5	18.5	550
	5	1.2	1.25	1.6	22.5	860
	10	1.4	1.25	1.7	28.5	1300
	20	1.6	1.6	1.9	36.0	2110
1 (1/1.13)	2	1.1	0.9	1.5	19.0	580
	5	1.2	1.25	1.6	23.0	920
	10	1.4	1.25	1.8	30.0	1410
	20	1.7	1.6	2.0	37.5	2320
1.5 (7/0.53)	2	1.2	0.9	1.5	21.0	680
	5	1.3	1.25	1.7	26.0	1120
	10	1.5	1.25	1.8	33.5	1720
	20	1.8	1.6	2.1	43.0	2900
2.5 (7/0.67)	2	1.3	1.25	1.6	24.5	960
	5	1.4	1.25	1.7	29.5	1390
	10	1.7	1.6	2.0	40.0	2470
	20	2.0	2.0	2.3	50.5	4130

Note : Above cables can also be manufactured & supplied with fire resistant type/LSOH on request



LOW VOLTAGE MULTI LAYER SHEATHED ARMoured CABLES FOR CHEMICAL PROTECTION Instrumentation Cable - Overall Screened

Reference standards: BS 50288-7:2005 Construction:	1) Oxygen Free Electronic Copper Conductor Class 1 & 2 2) XLPE Insulation 3) Overall screened with Aluminium Mylar Tape & Tinned Copper drain wire 4) PVC Bedding 5) Longitudinal overlapped Aluminium foil with extruded layer of HDPE & Polyamide (Nylon) covered multi layer sheath 6) Galvanized steel wire Armour 7) PVC Outer sheathing	Voltage: 300/500 V Max. Operating temperature: 900C
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Conductor Size	Number of Pairs	Thickness of Multi Layer Sheath	Size of Armour Wire	Thickness of Sheath	Approximate Overall Diameter	Approximate Cable Weight
mm ²	no.	mm	mm	mm	mm	kg/km
0.5 (1/0.8)	1	1.0	0.9	1.3	13.5	320
	2	1.0	0.9	1.4	16.5	440
	5	1.1	0.9	1.5	19.5	600
	10	1.3	1.25	1.6	25.0	1020
	20	1.4	1.25	1.7	30.0	1410
0.75 (1/0.98)	1	1.0	0.9	1.4	14.0	350
	2	1.0	0.9	1.5	17.5	500
	5	1.1	0.9	1.5	20.5	660
	10	1.3	1.25	1.7	26.5	1120
	20	1.5	1.25	1.8	32.5	1620
1 (1/1.13)	1	1.0	0.9	1.4	14.5	360
	2	1.1	0.9	1.5	18.0	530
	5	1.2	0.9	1.5	21.5	730
	10	1.3	1.25	1.7	27.5	1220
	20	1.5	1.25	1.8	33.5	1780
1.5 (7/0.53)	1	1.0	0.9	1.4	15.5	410
	2	1.1	0.9	1.5	19.5	610
	5	1.2	1.25	1.6	24.0	980
	10	1.4	1.25	1.8	31.0	1510
	20	1.6	1.6	1.9	39.0	2470
2.5 (7/0.67)	1	1.0	0.9	1.4	17.0	480
	2	1.2	0.9	1.6	22.0	750
	5	1.3	1.25	1.7	27.5	1250
	10	1.6	1.6	1.9	37.0	2200
	20	1.9	1.6	2.1	45.5	3350

Note : Above cables can also be manufactured & supplied with fire resistant type/LSOH on request





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