

MI series

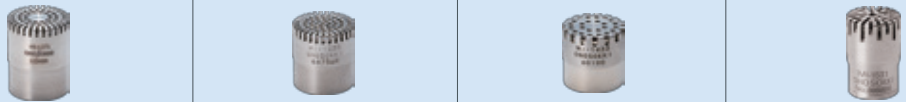
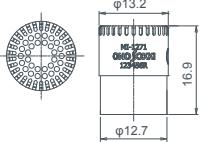
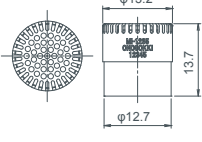
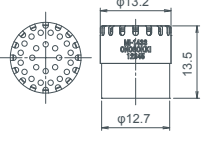
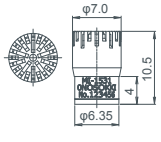
ONOSOKKI

Measurement Microphone

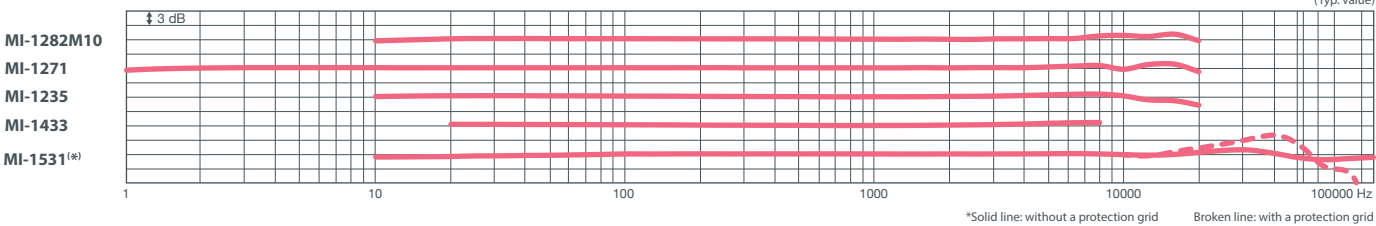
A variety of lineup for the acoustic measurement



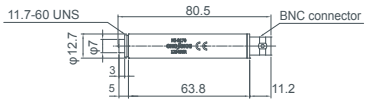
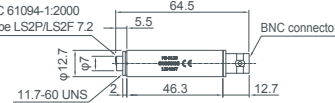
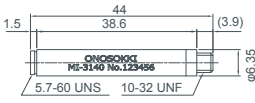
Measurement Microphone

Microphone				
	MI-1271	MI-1235	MI-1433	MI-1531
Appearance				
Feature	• 1/2-inch back electret type • High sensitivity • Supports low frequency • Supports measurement under severe temperature environment	• 1/2-inch back electret type • Supports audible region • Cost-effective type	• 1/2-inch back electret type • Cost-effective type	• 1/4-inch back electret type • Wide band measurement (up to 100 kHz) • Space-saving design
Polarization voltage	0 V			
Sensitivity	-26 ±1.5 dB re. 1 V/Pa 50 mV/Pa (1 kHz)	-29 ±3 dB re. 1 V/Pa 36 mV/Pa (1 kHz)		-48 ±3 dB re. 1 V/Pa 4 mV/Pa (250 Hz)
Frequency range	1 Hz to 20 kHz	10 Hz to 20 kHz	20 Hz to 8 kHz	10 Hz to 100 kHz (without protection grid) 10 Hz to 20 kHz (with protection grid)
Maximum sound pressure	135 dB (when using the MI-3170)	135 dB (when using the MI-3120)		157 dB (when using the MI-3140)
Self-noise level (A-weighting)	14 dB (Typ. value, when using MI-3170)	19 dB (Typ. value, when using MI-3120)		37 dB (Typ. value, when using MI-3140)
Operating temperature range	-30 to 80 °C	-10 to 50 °C		-30 to 60 °C (when using MI-3140)
Operating humidity range	0 to 90 %RH (with no condensation)	20 to 90 %RH (with no condensation)		0 to 90 %RH (with no condensation)
Storage temperature range	-40 to 70 °C	-20 to 70 °C		-30 to 80 °C
Storage humidity range	0 to 90 %RH (with no condensation)	10 to 90 %RH (with no condensation)		0 to 90 %RH (with no condensation)
Outer dimensions / weight	φ13.2 × 16.9 mm / approx. 6 g	φ13.2 × 13.7 mm / approx. 6 g	φ13.2 × 13.5 mm / approx. 6 g	φ7.0 × 10.5 mm / approx. 1.5 g
Applicable preamplifier	MI-3170	MI-3120		MI-3140
				

Free sound field response



Preamplifier

	MI-3170	MI-3120	MI-3140
Appearance			
Feature	• Measurement under severe temperature environment • Measurement of low frequency sound	• Cost-effective type • Multi-channel measurement	• Space-saving design • Wide frequency range
Size	1/2-inch		1/4-inch
Attenuation	0.15 dB (Typ. value at 1 kHz)	0.3 dB or less (Typ. value at 1 kHz)	0.35 dB (Typ.)
Frequency range	10 Hz to 40 kHz (+0.1 dB, -0.2 dB, referenced to 1 kHz) 1 Hz to 40 kHz (+0.1 dB, -1.5 dB, referenced to 10 Hz)	10 Hz to 20 kHz (±0.5 dB, referenced to 1 kHz)	10 Hz to 100 kHz (±0.5 dB, referenced to 1 kHz)
Self-noise (effective value voltage, A-weighting)	3.3 μV or less (10 Hz to 20 kHz)	5.0 μV or less (10 Hz to 20 kHz)	2.5 μV or less (20 Hz to 20 kHz)
Max. Output voltage	±8 V (peak) Equivalent to 135 dB SPL (when using the MI-1271)	±5.6 V (peak) Equivalent to 135 dB SPL (when using the MI-1235 / 1433)	±8 V (at 24 VDC) Equivalent to 157 dB SPL (when using the MI-1531)
Operating temperature range	-30 to 80 °C	-10 to 50 °C	-30 to 60 °C*
Operating humidity range	0 to 90 %RH (with no condensation)	0 to 90 %RH (with no condensation)	0 to 90 %RH (with no condensation)
Storage temperature range	-40 to 70 °C	-20 to 60 °C	-30 to 80 °C
Storage humidity range	0 to 90 %RH (with no condensation)	0 to 90 %RH (with no condensation)	0 to 95 %RH (with no condensation)
Power supply	CCLD 2 to 4.5 mA (rated 4 mA) 18 to 26 VDC (rated 24 V)	CCLD 2 to 5 mA (rated 4 mA) 24 to 32 VDC (rated 24 V)	CCLD 2 to 20 mA (rated 4 mA) 18 to 25 VDC (rated 24 V)
Applicable connector	C02(BNC)		10-32 UNF
Outer dimensions	φ12.7 × 80.5 mm	φ12.7 × 64.5 mm	φ6.35 × 44 mm
Weight	Approx. 35 g	Approx. 25 g	Approx. 5.5 g
Signal cable	MX-1000 series, MX-2000 series (recommended)	MX-2000 series (recommended)	NP-0120 series, NP-0180 series (recommended)
Outer appearance (Unit: mm)			

*This is the operating temperature range for the main unit only. If the signal cable NP-0120 series is included, the operating temperature range is -25 to 60 °C.

MI series

TEDS Microphone

MI-1271M12 Microphone with built-in amplifier (MI-1271+MI-3170)



A microphone with a built-in amplifier. This microphone can be directly connected to a device equipped with a CCLD (constant current drive) power supply using a BNC cable. When connected to a TEDS-compatible device, information such as sensitivity is automatically read, eliminating the need for complicated calibration work. Reliable measurement and time reduction are achieved.

Diameter, response type, polarization voltage	1/2 inch, free sound field, 0 V	Storage temperature range	-40 to 70 °C
Sensitivity	-26.0 ±1.5 dB re. 1 V/Pa (50 mV/Pa)	Storage humidity range	0 to 90 %RH (with no condensation)
Frequency range	1 Hz to 20 kHz (± 2 dB)	Power requirement	Constant Current Line Drive
Maximum sound pressure level (250 Hz, 3 % distortion)	135 dB or more	Drive current	2 to 4.5 mA (rated 4 mA)
Self-noise level (A-weighting)	14.0 dB (Typ.)	Drive supply voltage	DC18 to 26 V (rated 24 V)
Static pressure characteristics (250 Hz)	-0.013 dB/kPa	Output connector	C02 (BNC)
Temperature characteristics (250 Hz)	+0.005 dB/K	TEDS version	IEEE1451.4.2004 (Template: Microphone with built-in Preamplifier Ver.1.0)
Humidity characteristics (250 Hz)	-0.0004 dB/%	Outer dimensions, weight	φ13.2 × 91.9 mm, approx. 41 g
Operating temperature range	-30 to 80 °C	Accessory	Calibration chart × 1 Instruction manual × 1 Preamplifier holder (MI-0301) × 1
Operating humidity range	0 to 90 %RH (with no condensation)		

*Reference environmental condition: 23 °C, 50 % RH,101.3 kPa *Cable length conforming to CE marking: up to 30 m
*For the TEDS compatibility of the measuring instruments and amplifiers to be connected, contact the store where you purchased.

Low-noise Microphone

MI-1282M10



In order to create a more comfortable sound environment, there is a need to reduce the operating noise of products such as home appliances and information equipment, as well as the sound of motors and inverters that transmits into the vehicle interior. The Low-noise Microphone allows measurements in the 10 dB range (A-weighting), which is difficult to measure with normal measurement microphones. While conventional low-noise microphone requires a separate amplifier for power supply, this product adapts a CCLD (constant current drive) method and can be used by directly connecting to a CCLD-compatible analyzer.

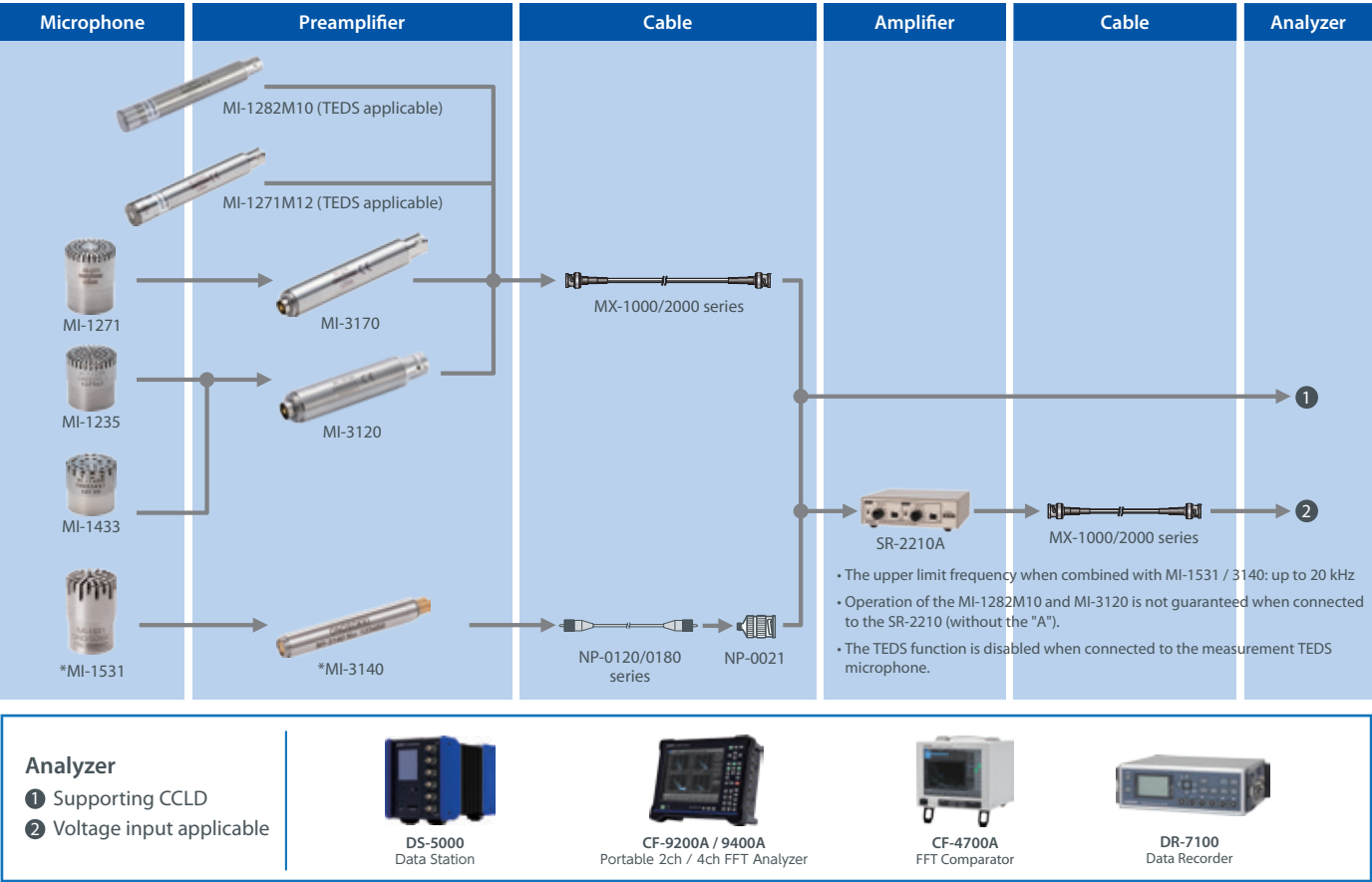
Diameter, response type, polarization voltage	1/2 inch, Free field, 0 V	Power supply	Constant current line drive
Sensitivity	-6.0 dB ± 2.0 dB re.1V/Pa (500 mV/Pa)	Driving current	2.8 to 20 mA (rated 4 mA)
Frequency range	10 Hz to 20 kHz (±3 dB) 10 Hz to 16 kHz (±2 dB)	Driving voltage	DC 24 to 32 V (rated 24 V)
Maximum sound pressure level (1 kHz, 3 % Distortion)	>100 dB (10 Hz to 5 kHz) >80 dB (5 kHz to 20 kHz)	Output connector	C02 (BNC)
Self-noise level (A-weighting)	4.5 dB (Typ.)	TEDS version	IEEE 1451.4 : 2004 (Template : Microphone with built-in Preamplifier Ver.1.0)
Operating temperature range	-10 to +60 °C	Outer dimension/Weight	φ 13.2 × 91.2 mm/ Approx. 37 g
Operating humidity range	0 to 85 % RH (no condensation)	Accessory	Calibration chart × 1 Instruction manual × 1 Preamplifier holder (MI-0301) × 1 Storage case × 1
Storage temperature range	-20 to +70 °C		
Storage humidity range	0 to 85 %RH (no condensation)		

*Reference environmental condition: 23 °C, 50 % RH,101.3 kPa *Cable length conforming to CE marking: up to 20 m
*For the TEDS compatibility of the measuring instruments and amplifiers to be connected, contact the store where you purchased.
*Compatible products for the MI-1282M10 Low-Noise Microphone: FFT Analyzers DS-5000 series, CF-9200A/9400A, CF-4700A
-When used in combination with the FFT analyzers DS-3000 Series, CF-9200/9400 (without the "A"), or CF-4700 (without the "A"), the microphone may not deliver its full performance under certain conditions.
Modification of these analyzers is required for use with the above models. For further details, please contact your nearest sales office or distributors.
*Compatible with the SR-2210A 2-Channel Sensor Amplifier. Operation is not guaranteed when connected to the SR-2210.

What is TEDS? It is the general format that contains sensor-specific information built into measurement sensors, and is defined in the IEEE 1451 series. When connecting the sensor to a TEDS applicable measurement device, information such as sensitivity is automatically read.

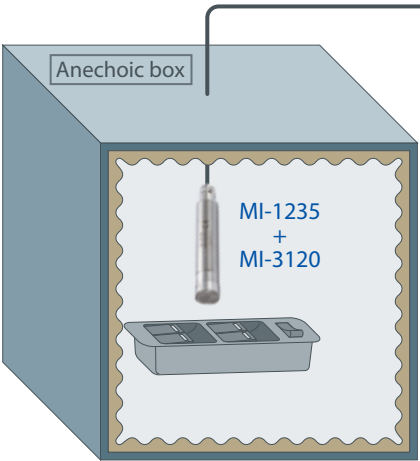
Measurement Microphone

System Configuration



Application examples

Pass/fail judgment of power window switches



Anechoic box

MI-1235 + MI-3120

FFT Comparator CF-4700A

The sound produced when pressing the switch may seem harsh if high frequency components are emphasized. To block out noise from the external environment, measurements are performed using a microphone in an anechoic box. The FFT comparator makes it possible to determine pass/fail judgment by setting thresholds for both sound pressure level and frequency characteristics.

Evaluation of electric vehicle running noise



MI-1271M12

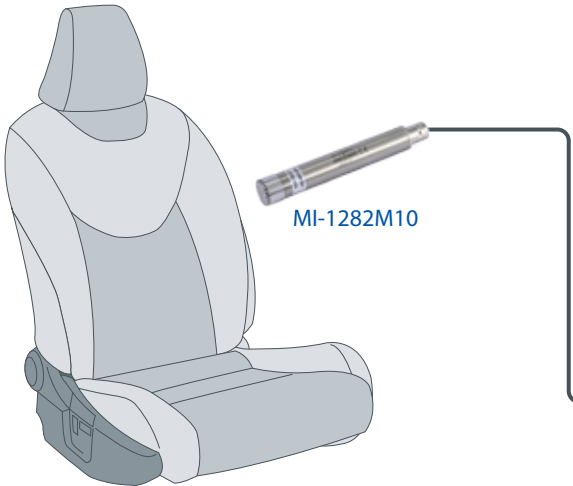
GPS Speedometer LC-8300A

DS-5000

O-Solution

Electric vehicles use inverters and motors as their power sources. The high-frequency pure tone components emitted by the inverter can be unpleasant inside the vehicle. A microphone is placed near the passenger's ear position to capture those sounds. At the same time, by performing the tracking analysis that follows changes in vehicle speed, it is possible to understand the correlation between frequencies of problematic sound and vehicle speed.

Evaluation of quietness for power seat motor



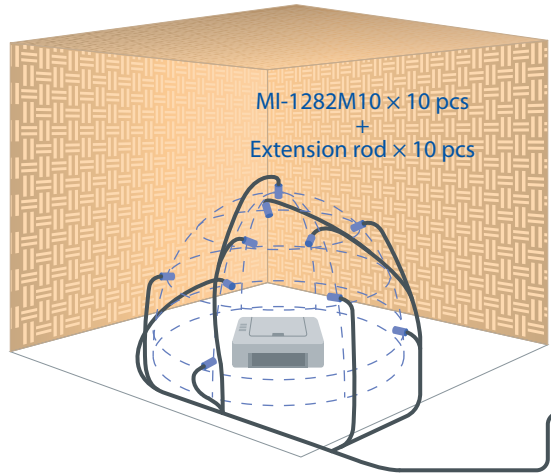
MI-1282M10

DS-5000

O-Solution

In addition to countermeasures of noise for the electrification of automobiles and wind noise, the quietness of vehicle interior is also being required. As a result, small sounds that were previously masked become unpleasant, and there is a demand to reduce the sound pressure levels of minute operating sounds generated by various components inside the vehicle. In order to implement effective countermeasures, it is important to perform frequency analysis and understand the dominant frequencies.

Sound power level measurement for minute sounds generated from printer in standby mode



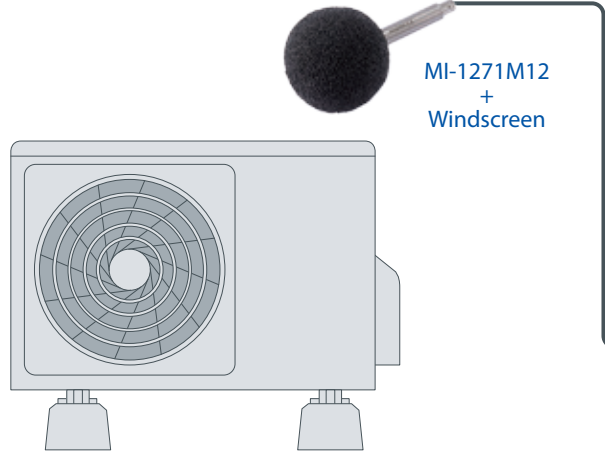
MI-1282M10 × 10 pcs + Extension rod × 10 pcs

DS-5000

OS-0541 Sound Power Level Using Sound Pressure

While general sound pressure level changes depending on the distance from a sound source or a test environment, sound power level is the specific values of sound sources and a global indicator that is also used for environmental labels and noise regulations. There is a need to reduce the operating noise from products such as home appliances and information equipment, which are difficult to measure with normal microphones. The low-noise microphone allows to measure an overall value of 20 dB or less. In addition, by using the extension rods, the effects of sound reflection caused by fixed stands, etc. can be reduced.

Noise measurement for outdoor unit of air conditioner



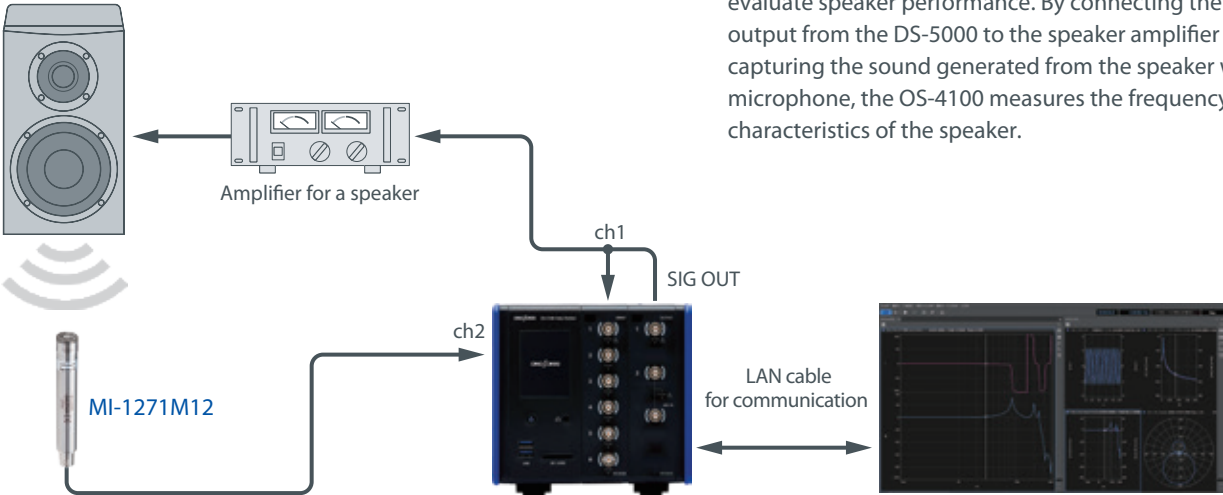
MI-1271M12 + Windscreen

DS-5000

O-Solution

Low frequency noise generated when the outdoor unit is operating travels to neighboring houses, which leads to complaints. In Japan, sound below approximately 100 Hz is called low frequency sound, and it cause discomfort to human and window glass and furniture to vibrate. Therefore, during the development stage, the operating sounds are measured by microphones and the low-frequency sound levels are checked from the results of frequency analysis to confirm if any countermeasures are necessary.

Evaluation of frequency characteristics of speaker



Amplifier for a speaker

ch1

SIG OUT

ch2

MI-1271M12

DS-5000

LAN cable for communication

OS-4100 Frequency response measurement software

Sound frequency characteristics is one of the factors that evaluate speaker performance. By connecting the signal output from the DS-5000 to the speaker amplifier and capturing the sound generated from the speaker with a microphone, the OS-4100 measures the frequency characteristics of the speaker.

Ono Sokki provides reliable and high level calibration results, based on the international reference "General requirements for the competence of testing and calibration laboratories" and the skills and know-how of quality assurance system that has been acquired through many years of practices.

Under the JCSS of calibration laboratory accreditation system, Ono Sokki is assessed and accredited as Accredited Calibration Laboratories to meet the requirements of the Measurement Law, relevant regulations and ISO/IEC.

We support 7 accreditation scopes, which is industry-leading in measurement instruments manufacturers.

*1 JCSS: Japan Calibration Service System

*2 ilac: International Laboratory Accreditation Conference

*3 MRA: Mutual Recognition Arrangements

■ Accreditation Scope

- Acoustics & Ultrasound
- Acceleration
- Torque
- Fluid flow
- Electricity (Direct Current & Low Frequency)
- Speed
- Time & Frequency & Rotational speed



Ono Sokki can issue the calibration certificates with the JCSS accreditation symbol, which assures the traceability to National Measurement Standards as well as a laboratory's technical and operational competence, and is acceptable in the world through the ilac^{*2}-MRA^{*3}.

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