

P/N: VS290-32

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Website

<http://www.flir.com>

Customer support

<http://support.flir.com>

Disclaimer

Specifications subject to change without further notice. Camera models and accessories subject to regional market considerations. License procedures may apply. Products described herein may be subject to US Export Regulations. Please refer to exportquestions@flir.com with any questions.



General description	
<p>The FLIR VS290-32 is the first industrial-grade Thermal MSX® Videoscope. The patented FLIR MSX (Multi-Spectral Dynamic Imaging) enhancement improves image clarity by embossing visual scene details on full thermal images, providing added context to help you accurately target potential issues in electrical, mechanical or building applications. The 2 m replaceable camera probe with flex points and low profile tip allows you to inspect hard to reach areas and take corrective action. The bright LED worklight helps navigate dark environments like attics, crawlspaces, underground utilities, etc. The FLIR VS290-32 is a rugged and versatile tool for the most demanding inspection jobs.</p>	
Key features:	
<ul style="list-style-type: none"> Identify and troubleshoot problems faster with the 160 × 120 true thermal imager and 2 MP visual camera. Includes 2 m replaceable camera probe with flex points for maneuverability. Use color alarms (Isotherms) to quickly identify areas of concern. Transfer images and video via USB Cable or wirelessly via Wi-Fi. IP Rated (IP67 camera tip, IP54 base unit and probe) provides a high level of protection against dust and water. CAT IV 600 V rated for electrical inspections. 	
Imaging and optical data	
IR resolution	160 × 120 pixels
Digital image enhancement	Yes
Thermal sensitivity/NETD	<100 mK
Field of view (FOV)	57° × 44°
Minimum focus distance	0.15 m
Minimum focus distance with MSX	0.65 m
Image frequency	8.7 Hz
Focus	Fixed
Detector data	
Focal plane array/spectral range	Uncooled microbolometer/7.5–14 μm
Detector pitch	12 μm
Image presentation	
Display resolution	320 × 240 pixels
Surface brightness (cd/m ²)	1000
Screen size	3.5"

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Image presentation	
Viewing angle	70°
Color depth (bits)	18-bit (262,144 color)
Aspect ratio	4:3
Display technology	TFT
Image modes	<ul style="list-style-type: none"> IR only Visual only MSX
Gallery	Yes
Measurement	
Object temperature range	-10°C to 400°C (14°F to 752°F) (at room temperature)
Accuracy	At ambient temp. 15 to 35°C (59 to 95°F) and object temp. above 0°C (32°F). 0 to 100°C (32 to 212°F): ±3°C (±5.5°F) 100 to 400°C (212 to 752°F): ±3%
Measurement analysis	
Spotmeter	<ul style="list-style-type: none"> Center spot Hot spot Cold spot
Color palettes	<ul style="list-style-type: none"> Iron Rainbow Gray Below alarm Above alarm
Probe	
Structure and Dimensions	2 m total length with 3 segments: <ul style="list-style-type: none"> 1.2 m semi-rigid 0.7 m rigid 0.1 m semi-rigid Probe tip dimensions: 71.7 x 40.5 x 11 mm (2.8 x 1.6 x 0.43 in)
Probe Insulation	2-layers of ruggedized insulating material. Black outer layer and bright yellow inner layer.
Set-up	
Set-up commands	Local adaptation of units, language, date, and time formats Screen brightness (high, medium, low) Gallery, deletion of images
Emissivity correction	3 pre-set and 1 custom emissivity setting
Languages	Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, simplified Chinese, Spanish, Swedish, traditional Chinese, Turkish
Service functions	
Camera software update	Download from http://support.flir.com

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Storage of images	
Storage media	16 GB SDHC
Image storage capacity	80 000
Image file format	Radiometric JPEG
Video file format	MPEG 4
Digital camera	
Resolution	2 MP (1600 × 1200 pixels)
Field of view	83°
Worklight	
Model	CREE XPG2
LED CCT	6500 K
LED CRI	70
Beam angle	120°
Rated power	0.7 W
Light output (Lumens)	117 lm
Data communication interfaces	
USB	USB Type-C: data transfer/power
Wi-Fi	Peer to peer (ad hoc) or infrastructure (network)
Power system	
Battery type	Rechargeable Li ion battery
Battery voltage	3.65 V, 5.7 Ah, 21 Wh
Battery operating time	>5 hours (full LCD brightness and worklight on)
Charging system	In camera or two-bay charger
Charging time (using two-bay charger)	2.5 hours to 90% capacity with charging status indicated by LEDs
Power management	Adjustable: off, 5 minutes, 15 minutes, 30 minutes
Environmental data	
Operating temperature range	-10 to +50°C (14 to 122 °F)
Storage temperature range	-20 to +60°C (-4 to 140 °F)
Humidity (operating and storage)	5% to 90% relative humidity (RH) non-condensing
EMC	EN 61326-1, EN 61000-6-2 (Immunity), EN 61000-4-2 (ESD), EN61000-6-3 (Emissions), FCC 47 CFR Part 15 Class B
Magnetic fields	EN 61000-4-8
Radio spectrum	2.4 GHz
Encapsulation	Probe tip : IP67 (IEC 60529) Main body/Tube : IP54
Shock	25 g (IEC 60068-2-29)
Vibration	2 g (IEC 60068-2-6)
Drop	Designed for 2 m (6.6 ft)

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Environmental data	
Safety	CAT IV 600 V
Environmental safety	ETL (EN 61010-1), CE, RCM, FCC WEEE, RoHS, REACH Department of Energy and California Title 20 Battery Charging Systems Efficiency
Physical data	
Weight (including battery)	1.14 kg (2.52 lbs)
Size (L x W x H)	221.8 x 11 x 26.4 cm (87.3 x 4.3 x 10.4 in)
Warranty and service	
Warranty	https://www.flir.com/testwarranty
Shipping information	
Packaging, type	Cardboard box
Packaging, contents	<ul style="list-style-type: none"> Printed documentation USB cable type A to C (1 m) Wrist strap Battery x 2 (FLIR P/N T199330ACC) Battery charger adapter (FLIR P/N T911633ACC) Sandisk SD card 16 GB
Packaging, weight	13.0 kg (28.66 lbs)
Packaging, size	120 x 48 x 20 cm (47 x 18.90 x 7.87 in)
EAN-13	0793950429020
UPC-12	793950429020
Country of origin	Taiwan
Technical support	
Website	http://support.flir.com
Accessories	
<ul style="list-style-type: none"> T199330ACC: Battery T199425ACC: Battery charger T911633ACC: Power supply for battery charger T911631ACC: USB 2.0 A to USB Type-C cable, 0.9 m 	

Supplies & accessories:

- VS290-00; Videoscope display and battery for VS290 series (no probes)
- VSC-IR32; Thermal 160x120 MSX camera probe with rectangular tip

Rechargeable Lithium Ion Battery (Series: LIC..., LIP..., LPP...)

1 Identification of the product and of the company undertaking

Product details

Trade name	Rechargeable lithium ion battery
Electrochemical system:	Lithium ion
Anode (negative):	Carbon (proprietary)
Cathode (positive):	Metal oxide (proprietary)

This MSDS applies to the following cell types or batteries assembled from these types.

The values listed for energy and voltage are given for reference only; they are not contractual assurances of product attributes and may differ from values given in specifications, data sheets or other documents or on the products.

Type	Energy per cell	Nominal voltage per cell
LIC 14500 PD	3.0 Wh	3.7 V
LIC 18650-FTC1H	3.5 Wh	3.2 V
LIC 18650-15 LC	5.6 Wh	3.6 V
LIC 18650-20 RC	7.2 Wh	3.6 V
LIC 18650-22 BT	8.1 Wh	3.6 V
LIC 18650-22 PC	7.8 Wh	3.7 V
LIC 18650-22 FC	8.0 Wh	3.6 V
LIC 18650-22 AL *)	7.9 Wh	3.6 V
LIC 18650-22 S3B *)	8.0 Wh	3.6 V
LIC 18650-25 FKD	9.3 Wh	3.7 V
LIC 18650-26 HC	9.4 Wh	3.7 V
LIC 18650-26 FC	9.6 Wh	3.7 V
LIC 18650-26 JC	9.5 Wh	3.63 V
LIC 18650-M26B	9.4 Wh	3.6 V
LIC 18650-26SKE	9.5 Wh	3.65 V
LIC 18650-29 EC	10.4 Wh	3.7 V
LIC 18650-29 FC	10.7 Wh	3.7 V
LIC 18650-30 BC	11.2 Wh	3.7 V
LIC 18650-VTC4H	7.6 Wh	3.6 V
LIC 18650-VTC5AH	9.4 Wh	3.6 V
LIC 26650-30 H	9.6 Wh	3.2 V
LIP 103450 SC	7.5 Wh	3.7 V
LIP 103450 AC	8.4 Wh	3.7 V
LIP 103450-CAT	7.3 Wh	3.7 V
LIP 383450 AJL *)	2.8 Wh	3.7 V
LIP 423048 AJL *)	2.6 Wh	3.7 V
LIP 423450 AJL *)	3.2 Wh	3.7 V

*) These cells contain SVHC substances > 0.1 % (see section 3)

Type	Energy per cell	Nominal voltage per cell
LIP 463048 FD	2.7 Wh	3.7 V
LIP 523450 AJL *)	4.1 Wh	3.7 V
LIP 553450 WC	4.2 Wh	3.7 V
LIP 663450 MC	4.9 Wh	3.7 V
LPP 383450 PL *)	2.6 Wh	3.7 V
LPP 402025 CE *)	0.5 Wh	3.7 V
LPP 402934 E *)	1.1 Wh	3.7 V
LPP 422339 PL *)	1.3 Wh	3.7 V
LPP 423566 BE *)	4.2 Wh	3.7 V
LPP 442834 PVL *)	1.5 Wh	3.7 V
LPP 443441 S *)	2.4 Wh	3.7 V
LPP 454261 8TH	5.9 Wh	3.7 V
LPP 463149 S *)	2.6 Wh	3.7 V
LPP 486588 H	13.0 Wh	3.7 V
LPP 503562 S *)	4.5 Wh	3.7 V
LPP 503759 DL *)	4.6 Wh	3.7 V
LPP 503759 8HH	5.2 Wh	3.7 V
LPP 523450 S *)	3.7 Wh	3.7 V
LPP 553048 PL *)	3.0 Wh	3.7 V
LPP 553436 S *)	2.9 Wh	3.7 V
LPP 683566 BE *)	6.7 Wh	3.7 V
LPP 702035 S *)	1.6 Wh	3.7 V
LPP 702035 PVL *)	1.6 Wh	3.7 V
LPP 751930 PL *)	1.5 Wh	3.7 V

*) These cells contain SVHC substances > 0.1 % (see section 3)

Supplier details

Address: VARTA Storage GmbH
Nürnbergger Straße 65
D-86720 Nördlingen
Germany

Emergency Phone Number: +49 7961 921 110 (VAC)

Legal remark (EU)

These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as "articles", no substances are intended to be released during handling. Therefore there is no obligation to supply a "safety data sheet according to Regulation (EC) 1907/2006, Article 31".

General remark

This information is provided as a service to our customers. The details presented are in accordance with our present knowledge and experiences. They are no contractual assurances of product attributes.

2 Hazards identification

The battery is sealed hermetically. Thus, the ingredients have no hazard potential, except the battery is violated or dismantled.

If in case of mistreatment the ingredients are released, a spontaneously flammable gas mixture may be released under certain circumstances (measures according to sections 4 to 6).

Attention: If batteries are treated wrong the danger of burns or bursts occurs. Batteries must not be heated above 100 °C or incinerated. The battery contents must not get in contact with water. If the negative electrode gets in contact with water or humidity hydrogen gas is formed, which may inflame spontaneously.

3 Composition/information on ingredients

Ingredients

Contents	CAS no.	Material
2 - 10 %	7429-90-5	Aluminum foil
20 - 50 %	Confidential	Metal oxide (proprietary)
0 - 5 %	Confidential	Binder
2 - 10 %	7440-50-8	Copper foil
10 - 30 %	Confidential	Carbon (proprietary)
10 - 20 %	Confidential	Electrolyte (proprietary)
Remainder	N/A	Inert materials

During charge process a lithium carbon intercalation phase is formed, which is highly flammable and corrosive, but not released under the circumstances of normal usage.

Heavy Metals and RoHS relevant Substances

Contents	CAS no.	Material
< 1 mg/kg	7440-43-9	Cadmium
< 10 mg/kg	7439-92-1	Lead
< 1 mg/kg	7439-97-6	Mercury (none intentionally introduced, see section 12)
< 5 mg/kg		Hexavalent Chromium (Cr6+)
< 5 mg/kg		PBB
< 5 mg/kg		PBDE

SVHC substances according to REACH (Article 33)

Contents	CAS no.	EC no.	Material
> 0.1 %	1120-71-4	214-317-9	1,3-Propanesultone (only for cells marked with *) in section 1)

For information to allow safe use: see section 7.

4 First-aid measures

Measures at accidental release

After inhalation:	Fresh air. Seek for medical assistance.
After skin contact:	Remove solid particles immediately. Flush affected areas with plenty of water (at least 15 min). Remove contaminated cloth immediately. Seek for medical assistance.
After eye contact:	Flush the eye gently with plenty of water (at least 15 min). Seek for medical assistance.
After ingestion of battery components:	Drink plenty of water. Avoid vomiting. Seek for medical assistance. No trials for neutralization.

5 Fire-fighting measures

Suitable extinguishing media:	Metal fire extinction powder, rock salt or dry sand shall be used. In case only water is available, it can be used in large amounts.
Extinguishing media with limited suitability:	Carbon dioxide (CO ₂) is not suitable. Water in small quantities may have adverse effects.
Special protection equipment during fire-fighting:	Contamination cloth including breathing apparatus.
Special hazard:	Cells may explode and release metal parts. At contact of electrolyte with water traces of hydrofluoric acid may be formed. In this case avoid contact and take care for good ventilation. At contact of charged anode material with water extremely flammable hydrogen gas is generated.
Attention:	Do not let used extinguishing media penetrate into surface water or ground water. If necessary, thicken water or foam with suitable solids. Dispose of properly.

6 Accidental release measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, face protection, breathing protection).
Environment protection measures:	Bind released ingredients with powder (rock salt, sand). Dispose of according to the local law and rules. Avoid leached substances to penetrate into the earth, canalization or water.
Treatment for cleaning:	If battery casing is dismantled, small amounts of electrolyte may leak. Package the battery tightly including ingredients together with lime, sand or rock salt. Then clean with water.

7 Handling and storage

Guideline for safe handling:	Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries. Use recommended charging time and current. Do not open or disassemble batteries.
Storage:	Storage preferably at room temperature (approx. 20 °C). Avoid large temperature changes. Do not store close to heating devices. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.
Storage category according to TRGS 510:	It is recommended to consider the "Technical Rule for Hazardous Substances TRGS 510 - Storage of hazardous substances in nonstationary containers" and to handle lithium ion batteries do according to storage category 11 ("combustible solids").
Storage of large amounts:	Follow the recommendations of the German Insurance Association (GDV - "Gesamtverband der Deutschen Versicherungswirtschaft e.V.") concerning lithium batteries: https://vds.de/fileadmin/vds_publikationen/vds.3103en_web.pdf In case of storage of large amounts (used storage volume > 7 m ³ and/or more than 6 pallets) batteries shall be stored in fire-resistant or separated rooms or areas (e.g. warehouse or container for hazardous materials). Mixed storage with other products is not allowed. The storage area shall be monitored by an automatic fire detection system, connected to a permanently manned place. A fire-extinguishing system shall reflect the extinguishing agents mentioned in section 5.

8 Exposure controls/personal protection

Under normal conditions (during charge and discharge) release of ingredients does not occur.

9 Physical and chemical properties

Not applicable if closed.

10 Stability and reactivity

Dangerous reactions: When heated above 100 °C the risk of rupture occurs.

11 Toxicological information

Under normal conditions (during charge and discharge) release of ingredients does not occur. In case of accidental release see information in sections 2 to 4 and 6.

12 Ecological information

VARTA lithium ion batteries do not contain heavy metals as defined by the European directives 2006/66/EC Article 21; they comply with the chemical composition requirements of this Directive.

Mercury has not been "intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)" in the sense of the U.S.A. "Mercury-Containing and Rechargeable Battery Management Act" (May 13 1996).

The Regulation on Mercury Content Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines 'low mercury' as 'mercury content by weight in battery as less than 0.025%', and 'mercury free' as 'mercury content by weight in battery as less than 0.0001%'. And therefore: VARTA lithium ion batteries belong to the category of mercury-free battery (mercury content lower than 0.0001%).

13 Disposal considerations

USA: Lithium ion batteries are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by Call2Recycle, Inc. Please go to their website at www.call2recycle.org for additional information.

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (http://www.epbaeurope.net/legislation_national.html).

Importers and users outside EU should consider the local law and rules. In order to avoid short circuit and heating, used lithium ion batteries should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals
- Embedding in dry sand

14 Transport information

VARTA lithium ion batteries are considered to be UN 3480 Lithium Ion Batteries, and are tested according to 38.3 of the "UN Manual of Tests and Criteria" for compliance with the requirements of special provisions ADR 188, IMDG 188, as well as the requirements of DOT / 49 CFR § 173.185, and the requirements of IATA DGR packing instruction 965. Test results as well as other relevant information required for transportation are given in dedicated "Declarations of Conformity".

Please note that for some products state of charge and VARTA packaging are not designed for air transport in bulk after 01 April 2016; this does not affect air transport of batteries packed with equipment or contained in equipment.

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN 3481.

During the transportation of large amounts of batteries by ship, trailer or railway, do not store them in places of high temperature and do not allow them to be exposed to condensation. During the transportation do not allow the packaging to be damaged, as a damage of the packaging may cause fire. In the event packaging is damaged, special procedures must be used including inspection and repackaging if necessary and handle with care.

Code of practice for packaging and shipment of secondary batteries given in IEC 62133: The packaging shall be adequate to avoid

mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

Compilations of transport requirements for Lithium batteries can be found in:

<https://www.lithium-batterie-service.de/en/>

<https://www.iata.org/whatwedo/cargo/dgr/Documents/lithium-battery-shipping-guidelines.pdf>

Each cell or battery is manufactured under a quality management program according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 e), and IMDG code clause 2.9.4.5.

15 Regulatory information

Marking consideration

European Union: According to "DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC" the batteries have to be marked with the crossed wheel bin symbol. According to Commission Regulation (EU) No 1103/2010 portable secondary (rechargeable) batteries and accumulators shall be marked with a capacity marking, except those which are incorporated or designed to be incorporated in appliances before being provided to end-users, and not intended to be removed.

Rechargeable Lithium ion batteries, which contain electronic modules (e.g. PCM) and which are subjected to the EMC directives 2004/108/EC or 2014/35/EU (as they are end-user replaceable devices), must undergo a EU conformity assessment and must wear the CE marking.

According to Dangerous Goods Regulations (see section 14) battery packs have to be marked with the Watt-hour rating.

Water hazard class

The regulations of the German Federal Water Management Act (WHG) are not applicable as Li-Ion Accus are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled.

16 Other information

Note: Date of issue of the transport regulations: ADR 2019, RID 2019, IATA DGR 2019 (60th edition), IMDG 2016, DOT / 49 CFR 2019.

Latest covered modification of the European Battery Directive 2006/66/EC: Directive (EU) 2018/849.

RoHS: See special Declaration

https://www.varta-storage.com/wp-content/uploads/General-Declarations-RoHS_Declaration_VS.pdf

REACH: See special Declaration

https://www.varta-storage.com/wp-content/uploads/General-Declarations-REACH_Declaration_VS.pdf

Issued by: VARTA Microbattery GmbH
Quality / Environmental Management

Contact: <https://www.varta-storage.com/contact-storage/?lang=en>

Updates: Current SDS can be downloaded from VARTA's web page
<https://products.varta-microbattery.com/en/news-downloads/document-search.html>
(select Document Type "MATERIAL SAFETY DATA SHEET").

Test report identification no.: 2019-05-29-01

Producer: VARTA Microbattery SRL
Bulevardul Grivitei 1X, 500177 Braşov, ROMANIA

Test Laboratory: Application Test Lab
PT. VARTA Microbattery (Indonesia)
Batam Industrial Park
Jalan Angsana BLK 309 & 310, Mukakuning
Pulau Batam Riau 29433 Indonesia

Lab-internal reference no.: JT60806

Lab-internal test date: 2016-11-04

Object of the declaration:

Type of battery:	Rechargeable Lithium ion battery
Article:	2P/LIC18650-29EC PCM PC – SOC 30%
Material no.:	718811
VKB no.:	56636 702 095
IEC Designation:	1INR19/65-2
Voltage:	3.65V
Watt-hour rating:	20Wh
Mass (approx.):	135 g

The object of the declaration described above is in conformity with the requirements of the following document:

Documents No.	Title	Edition / Date of issue
ST/SG/AC.10/11/Rev.5	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3	2009
Amend. 1		2011

List of tests conducted and results:

Test Item	Test Result
T1. Altitude simulation	Pass
T2. Thermal test	Pass
T3. Vibration	Pass
T4. Shock	Pass
T5. External short circuit	Pass
T6. Impact	Pass*
T7. Overcharge	Pass
T8. Forced Discharge	Pass*

**Reference to report of LIC18650-29EC cell*

Additional information:

In original VARTA packaging the products comply with the following special provisions of international transport regulations:

- IATA DGR: Packing Instruction 965 Section IB (max. 30 % state of charge)
(Transportations of cells or batteries packed with equipment or contained in equipment have to follow Packing Instructions 966 or 967 Section II.)
- ADR/RID/ADN/IMDG Code: Special Provision 188
- DOT / 49 CFR: §173.185 (c)

The products have been manufactured under a quality management programme according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 (e) and IMDG code clause 2.9.4.5.

Singapore, 29 May 2019
(place and date of issue)



(company stamp)



(signature)
(Low Chee Leong)
Manager
Technical Support

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