



2025

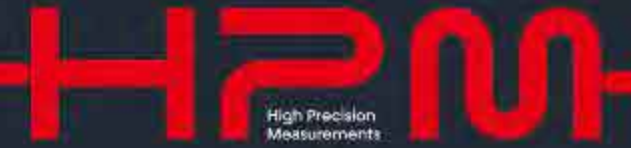
HPS

High Precision
Measurements

A Ukrainian developer and
producer of high-temperature
strain gauges



OUR CUSTOMERS IN EUROPE



We are committed to building long-term relationships with our customers, and we are always looking for new ways to meet their needs.



SIEMENS

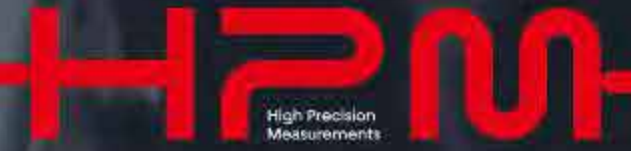
Acce/eron



GE Aviation



OUR CUSTOMERS IN UKRAINE



on Ukrainian market since 2012 Cooperation with the
Leading aerospace and aircraft companies in Ukraine:



ЗОРЯ-МАШПРОЕКТ



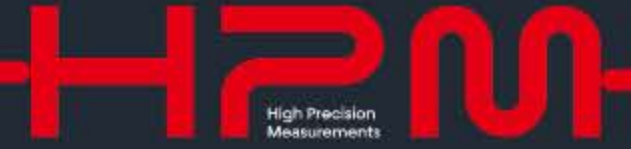
АНТОНОВ



**IVCHENKO
PROGRESS**



BENEFITS OF WORKING WITH US



The one and only competitor in the world



Lower prices and flexible payment terms



Shorter lead time



Wider range of products and services



The ability to produce special products for the customer



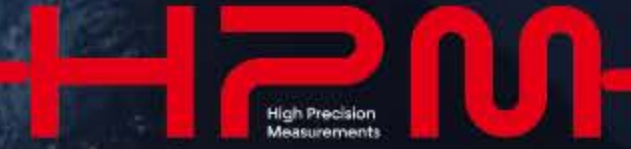
Deep understanding of customer problems



Faster response to customer



OUR COMPANY



HPM KYIV

- Global Logistics
- Management & Accounting
- Mechanical Production
- Production of SG
- Installation Services
- Thermocouple Manufacturing



HPM USA

- Production of SG
- Installation Services
- North America sales



HPM POZNAN

- EU and global logistics



UTT

- China distributor

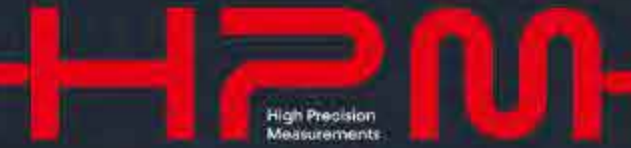


BIAS MÜHENDISLIK

- Turkey distributor



OUR COMPANY



Our company was founded in 2012, with more than 20 employees and an annual turnover of 4 million USD.

The core of our team consists of specialists from Motor-Sich PJSC — the leading aircraft engine factory in Ukraine.

Our employees are highly experienced in strain gauge production, metrology, certification, non-destructive failure analysis, strength of materials, and related fields.

We have organized numerous workshops on strain measurements both in Ukraine and abroad.



Oleksandr Pohuliaiko

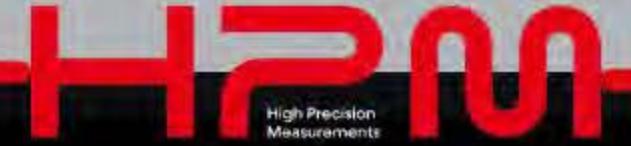
Key Contact Person



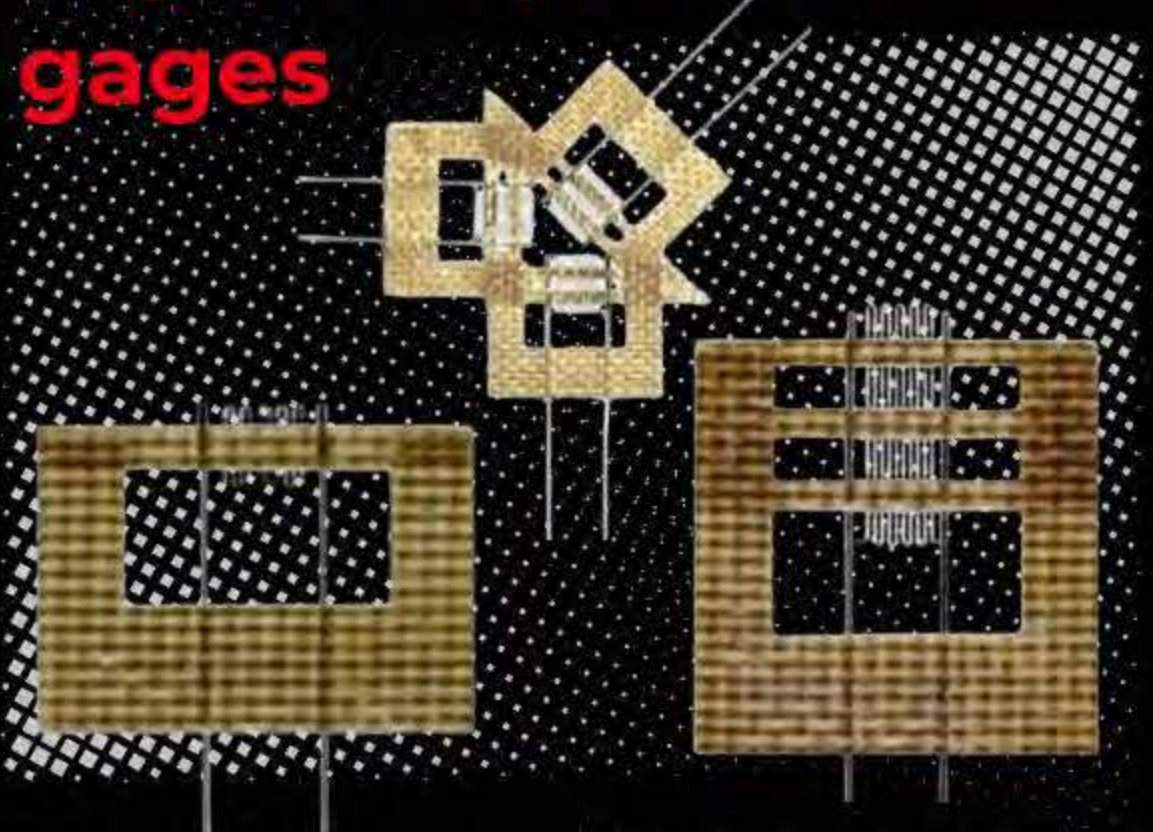
hpm-gages.com



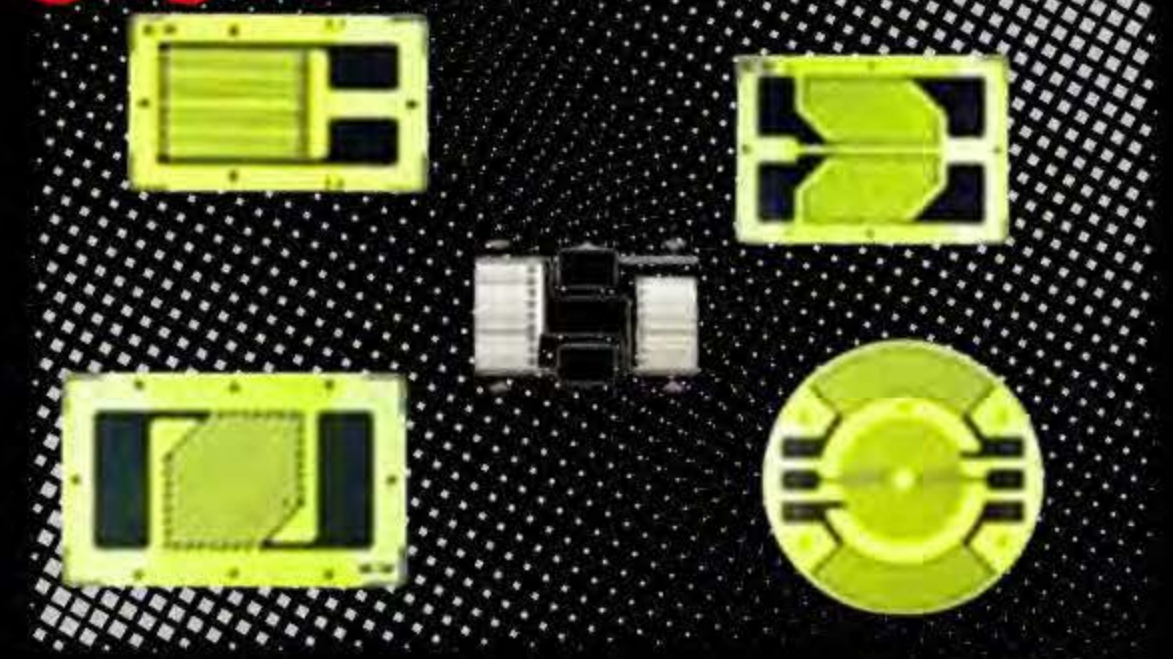
WIDE RANGE OF PRODUCTS



High-temperature gages



Mid-temperature gages



Installation kits



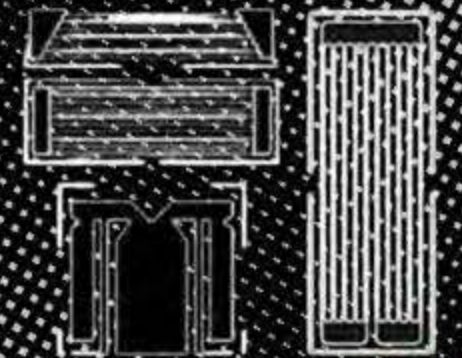
Rotation signal transmitter



Special equipment



Special strain gages



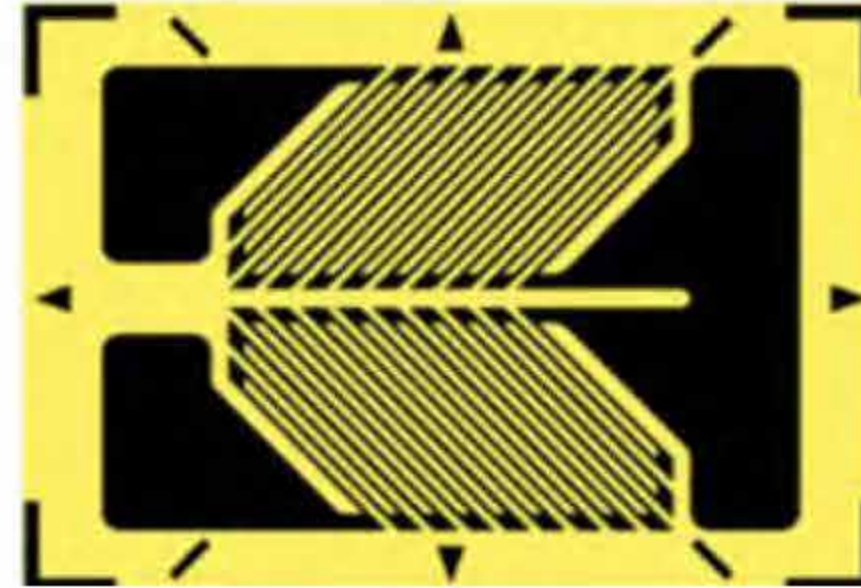
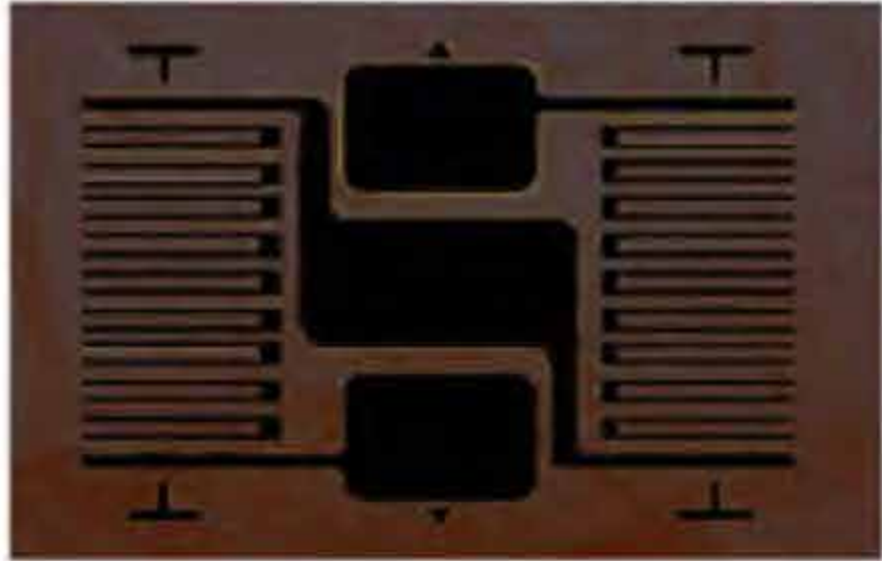


**SPECIAL SOLUTIONS
FOR JET ENGINE
INDUSTRY AND
OTHER
APPLICATIONS**



FOIL STRAIN GAGES

HPM



BQ250

Backing material: phenolic-soaked paper

Temperature range: -269...+250°C

Adhesion: good

Moist resistance: low

Special properties: follows the object shape

Typical gage factor: 2.0 to 2.2

BAB350

Backing material: fiberglass-reinforced polyimide with silicone adhesive

Temperature range: -269...+350 (400)°C

Moist resistance: perfect

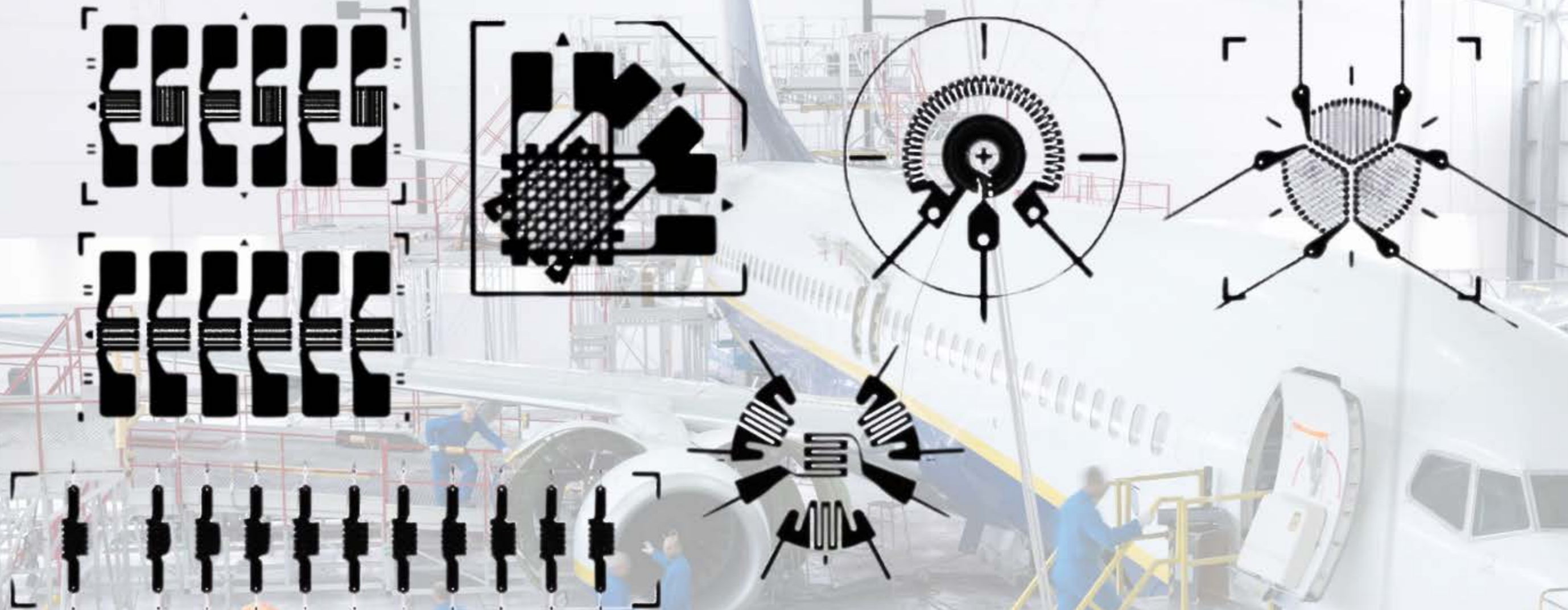
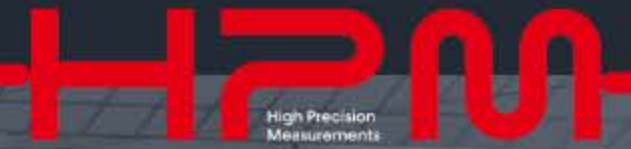
Special properties: widest temperature range

Typical gage factor: 1.8 to 2.0

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DEDICATED STRAIN GAGES FOR STRENGTH TESTS

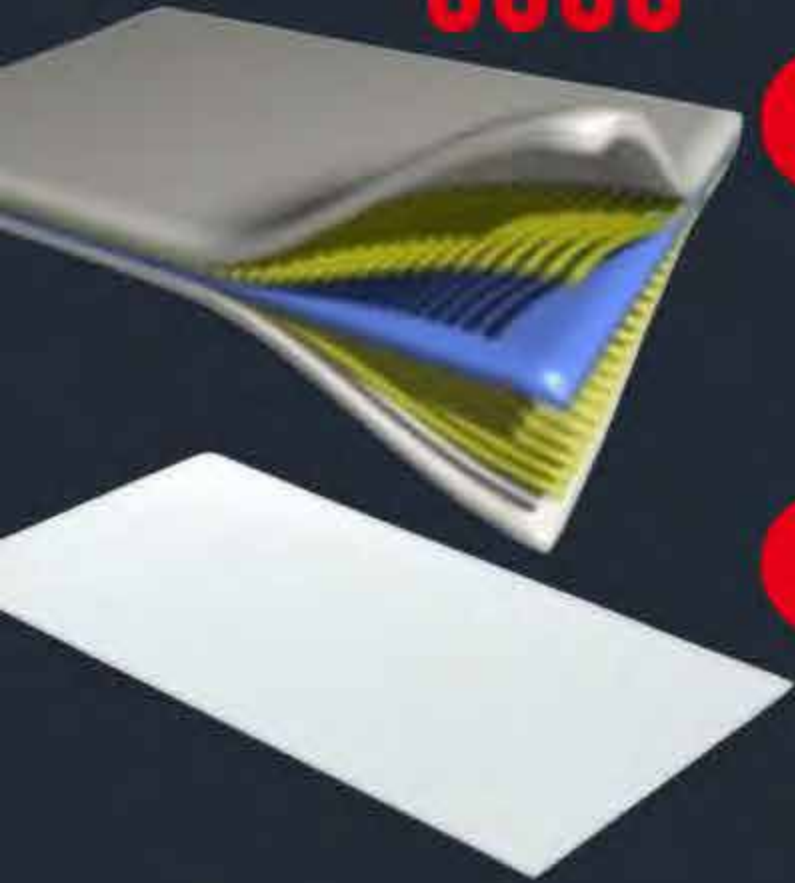
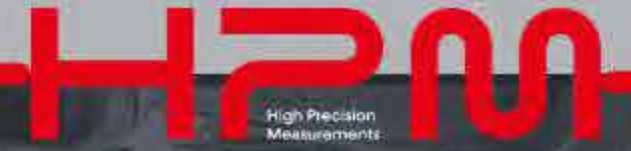


**SPECIAL AND
CUSTOM
GEOMETRIES**

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DEDICATED STRAIN GAGES FOR STRENGTH TESTS

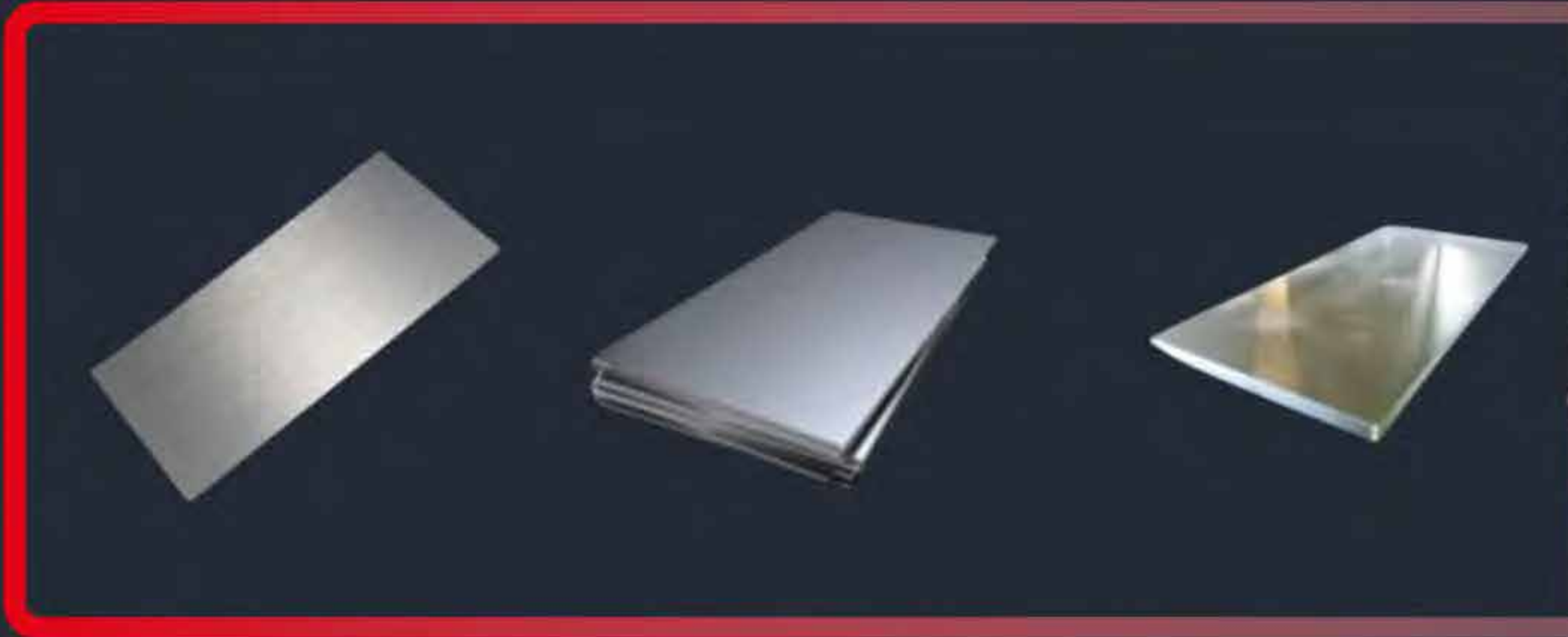


from $2 \cdot 10^{-6} \text{ } ^\circ\text{C}^{-1}$ for composites

to $65 \cdot 10^{-6} \text{ } ^\circ\text{C}^{-1}$ for plastics

$(2, 9, 11, 16, 23, 27, 65) \cdot 10^{-6} \cdot ^\circ\text{C}^{-1}$

Self-temperature compensation for composites, titanium, steel, copper, aluminum, magnesium, plastics



OEM PRODUCTION OF EXCLUSIVE PATTERNS BY OEM PRODUCERS



**PROVEN
QUALITY
AND
CUSTOM
DESIGN**



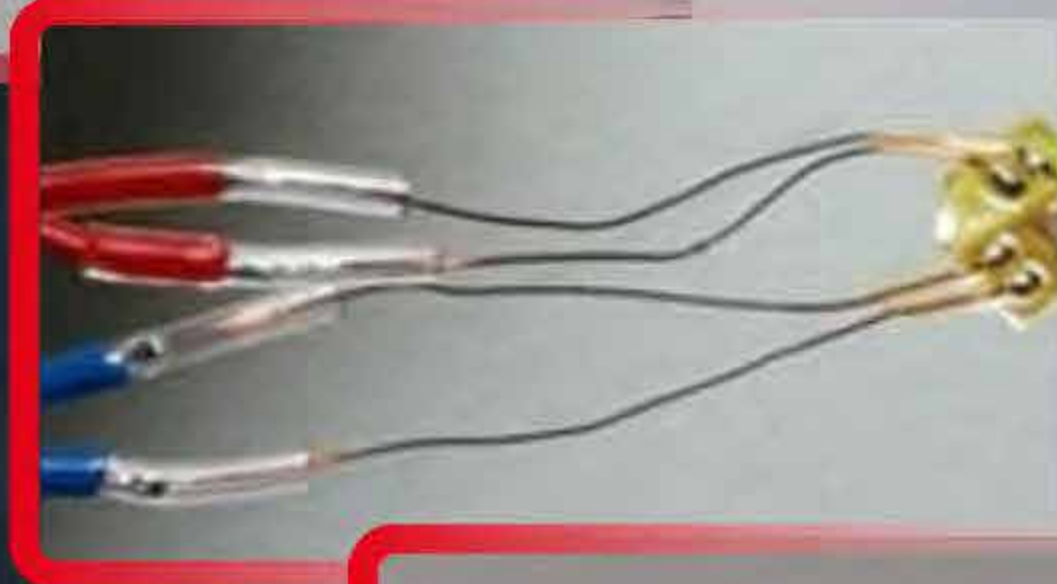
Reduced backing sizes

Extra-small (1 mm and below) base length

Enlarged bond pads

Chains of strain gages

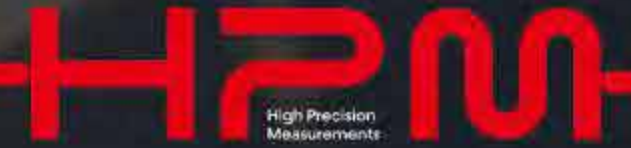
Customized lead wires



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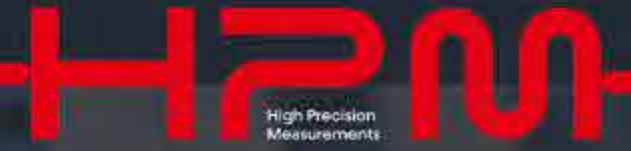
NICKEL-PLATED WIRE WITH POLYIMIDE INSULATION FOR 250°C



Long term working temperature range, °C	60° to +220°C
24 hours working temperature range, °C	-60° to +300°C
Number of insulation layers	1
Service life	20'000 hours
Corematerial	nickel-plated copper
Insulation	enamel polyimide insulayion
Wire diameter	0,063 - 2,500 mm



UNIQUE TYPES OF HPM ADHESIVES



<i>Parameter</i>	<u>HS-400</u>	<u>UV-glue</u>
<i>Thermal curing cycle</i>	7:30 hours (3 steps of heating)	3 min. under UV Lamp
<i>Lifetime</i>	6 months at 30°C	12 months at 21°C
<i>Operating temperature range</i>	-250°C ... +400°C	-30°C ... +300°C (shortly up to 350°C)



HPM TECHNOLOGY FOR 350°C (SHORTLY 400°C) STRAIN MEASUREMENT

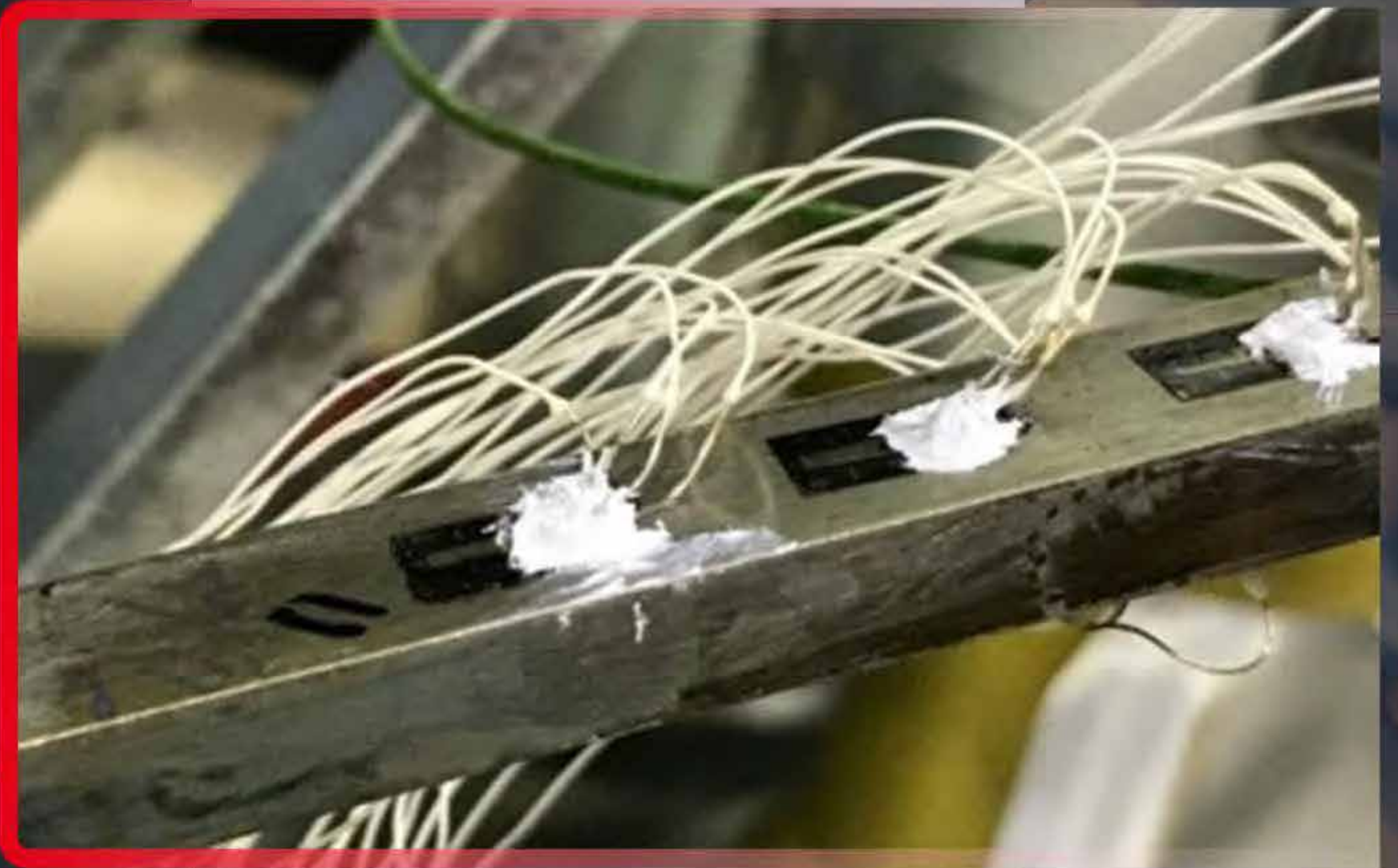


Custom fiberglass-reinforced
polyimide backing gages

Welded wires

HS-400 adhesive

Special protective sealant

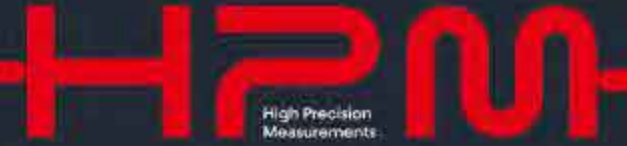


All necessary
materials and
consumables are
provided along
with detailed
instructions!

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HPM HIGH-TEMPERATURE WIRE STRAIN GAGES



Grid material:

NiCr: **-269 to +900°C**, gage factor 1.8 to 2.1

FeCrAl: **-269 to +1100°C**, gage factor 1.9 to 2.3

PtW: **-269 to +1150°C**, gage factor 3.5 to 4.2



HPM HIGH-TEMPERATURE WIRE STRAIN GAGES



Single-component configurations:

Sensitive grid base length: 1-10 mm;

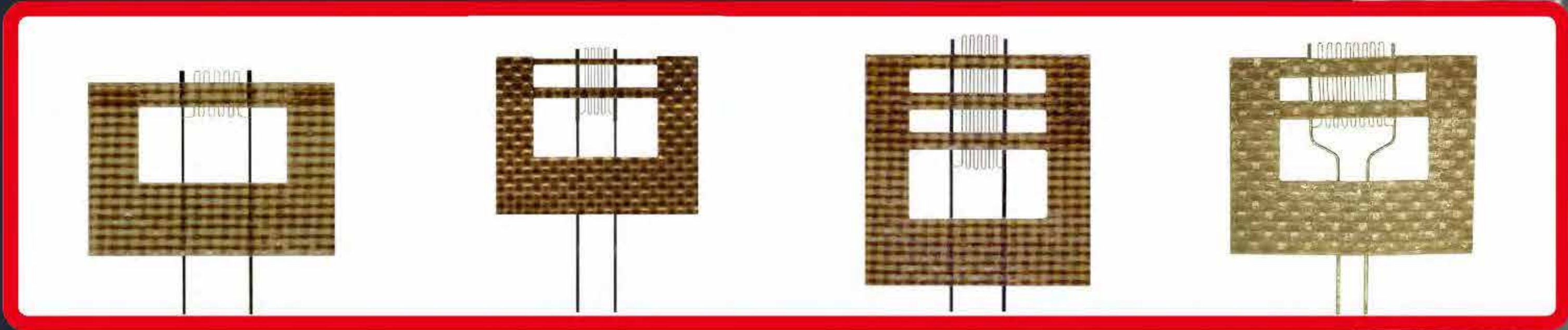
Resistance: 100-700 Ohm;

Lead wires length: 30-300 mm;

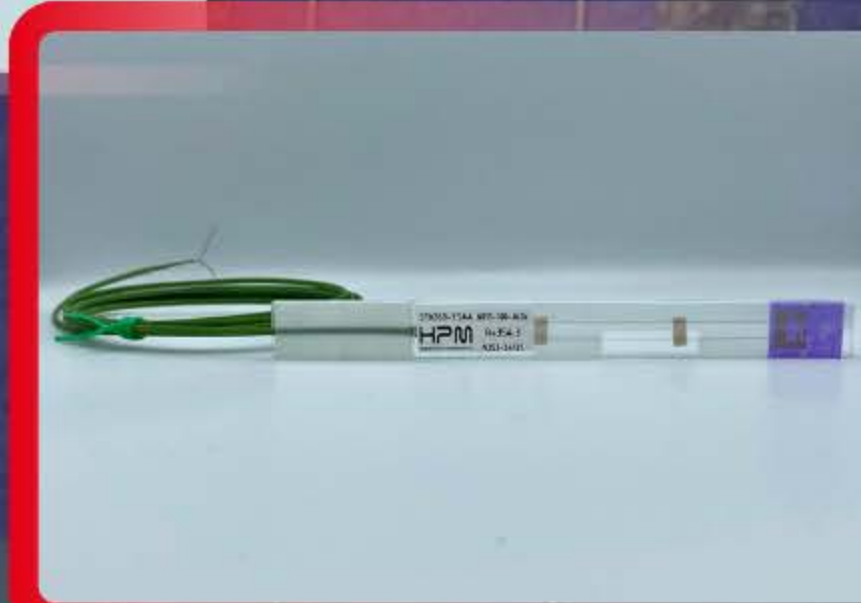
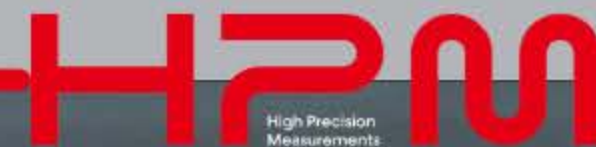
Lead wires length: 0,07-0,15 mm;

High temp. elongation wires: 0,5-5 m;

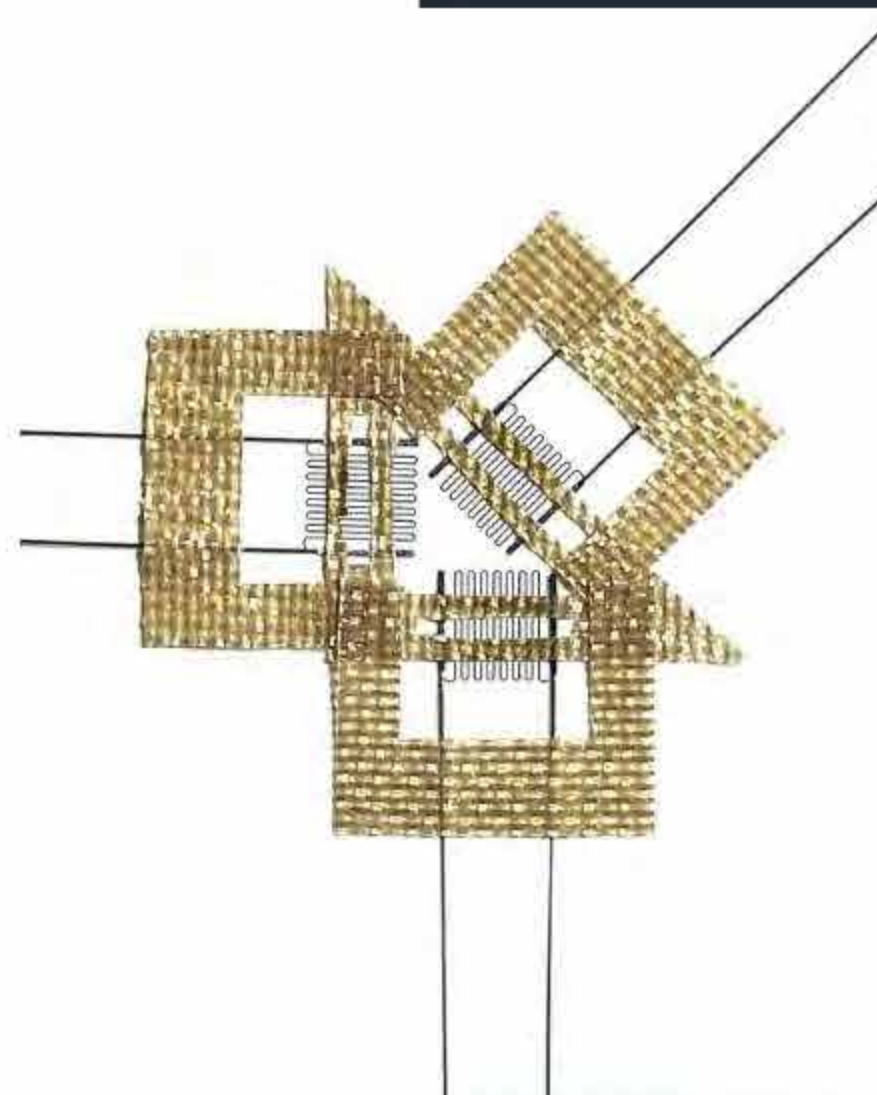
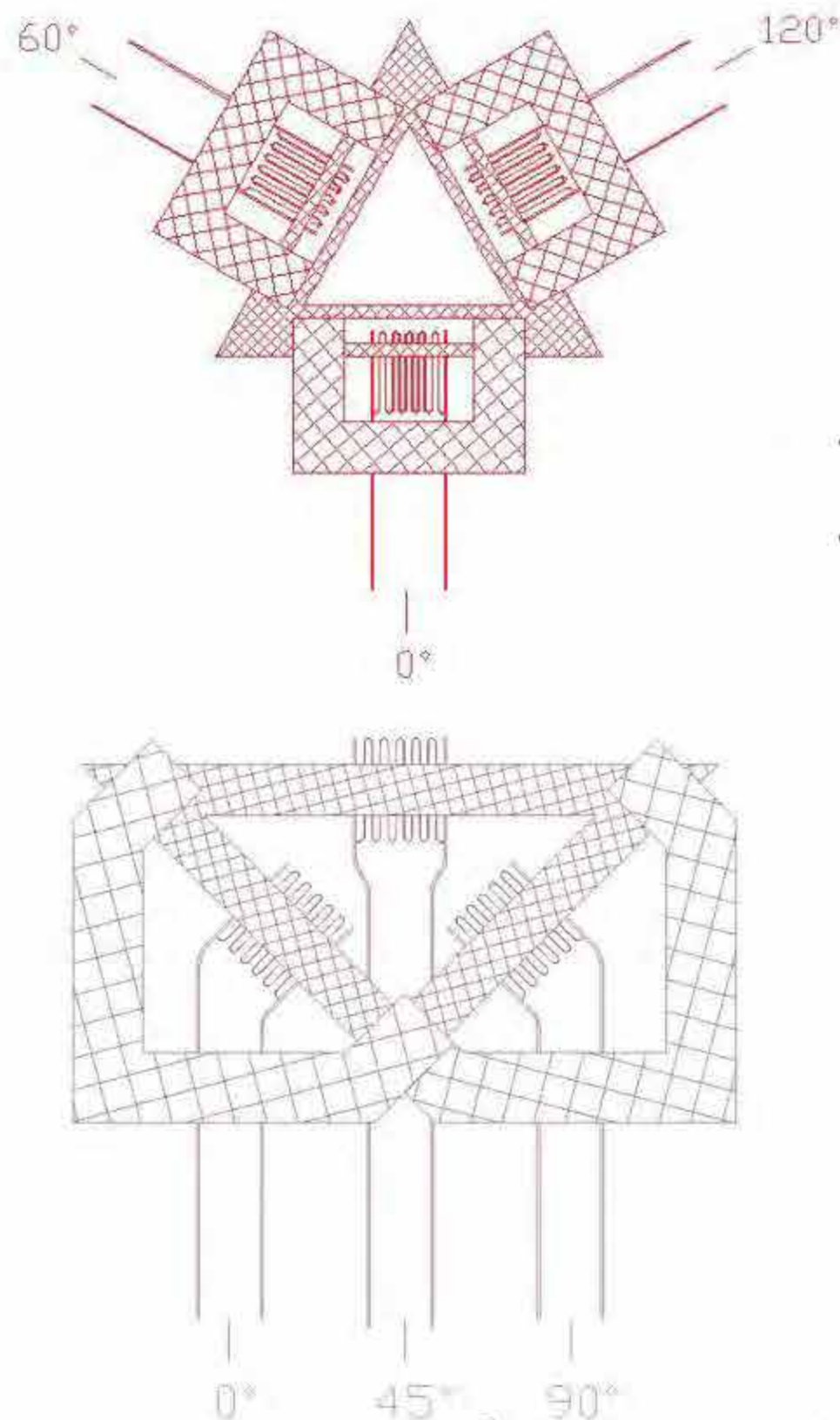
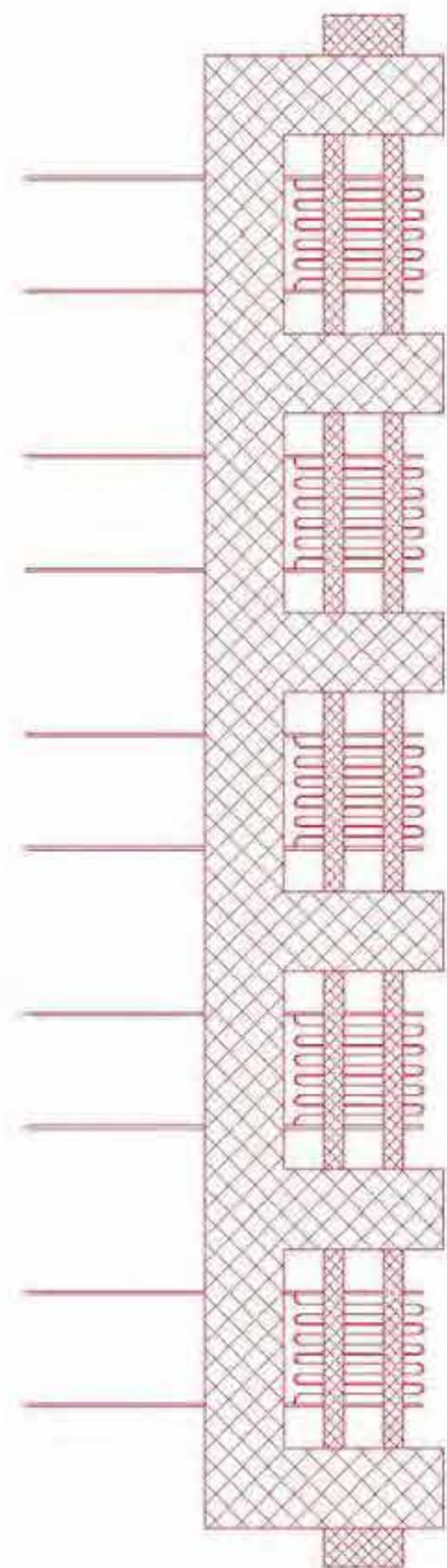
Sensitive grid alloys: NiCr, FeCrAl, PtW.



WIRE STRAIN GAUGES WITH HIGH TEMPERATURE ELONGATION WIRES



HPM HIGH-TEMPERATURE WIRE STRAIN GAGES



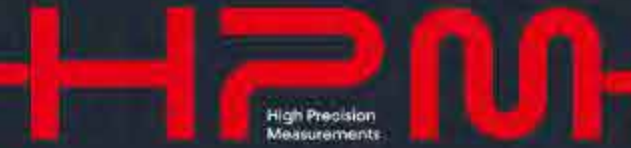
Wire SG Rosettes and Chains



- Two/three/four/five - component
- Chains and rosettes



HPM HIGH-TEMPERATURE WIRE STRAIN GAGES



Datasheet features calibration data in form of apparent strain and gage factor graphs (STF350 example):



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 Registration code: 2470702
 IP-A, Kypriotes St, Kyrenia, Cyprus
 Tel: +357 97475 800
 Email: info@hpmg.com

Rev. 03
 September

STF series high temperature strain gages
Product Datasheet

General information:
 STF series high-temperature strain gages are provided for measurement of deformations in the parts of machinery and equipment, including jet engines, turbo-machines and electric loads in 1000-1500°C temperature range.
 Nominal grid of the gage is made of 0.25 mm diameter (0.010 inch) diameter wires.
 Strain gage is fixed with the temporary frame (thermo-resistant film).
 Lead wires are made of 0.25 mm diameter (0.010 inch) diameter wires. Lead wires are fixed in metal or the other suitable insulation material of the lead wires is epoxy-resin or other suitable material.
 of the lead wires (0.25 mm, both diameters) can be adjusted to require. Typical resistance of the grid is 350 Ω (nominal resistance 350 Ω) (nominal resistance of the grid is given excluding resistance of the lead wires (see table 1)).

Designation system:

STF 120 - 3 AA-A 1150 - F 010 - 50

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 Email: info@hpmg.com

Rev. 03
 September

Schematic drawing:

Standard configurations:

Designation	Nominal resistance, Ω	Nominal lead length, mm	Nominal grid length, mm	Lead wires length, mm
STF 120-3 AA-A 1150-010-50	350	10	20	50
STF 120-3 AA-A 1150-010-100	350	10	20	100
STF 120-3 AA-A 1150-010-150	350	10	20	150
STF 120-3 AA-A 1150-010-200	350	10	20	200

Temporary carrier:
 High-temperature PTFE coating is provided on the back of the gage to provide protection to the gage during transportation.

Packaging:
 Individual strain gages are supplied in plastic or glass carriers. Carriers with adhesive film are supplied with the gage during transportation. Single gages are packed in plastic bags. 25 pieces of 10 pieces (each group packing) are packed with the same parameters of the gages, including resistance range of the gages, gage factor, gage factor, impedance, etc.

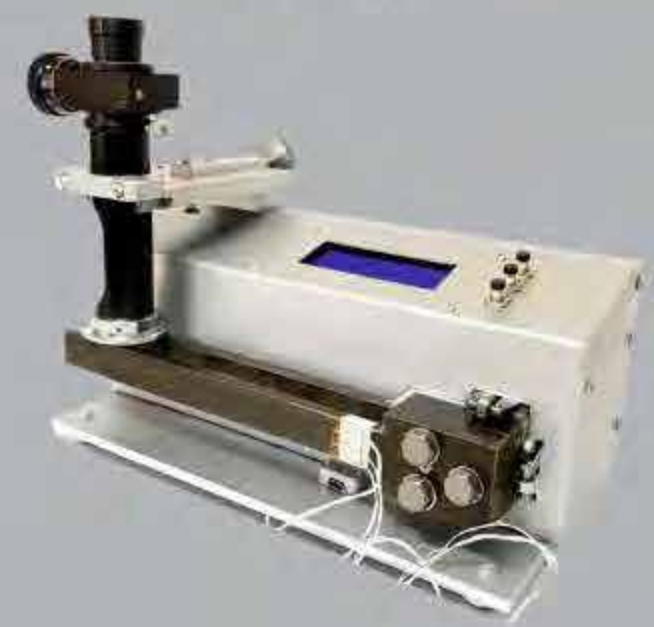
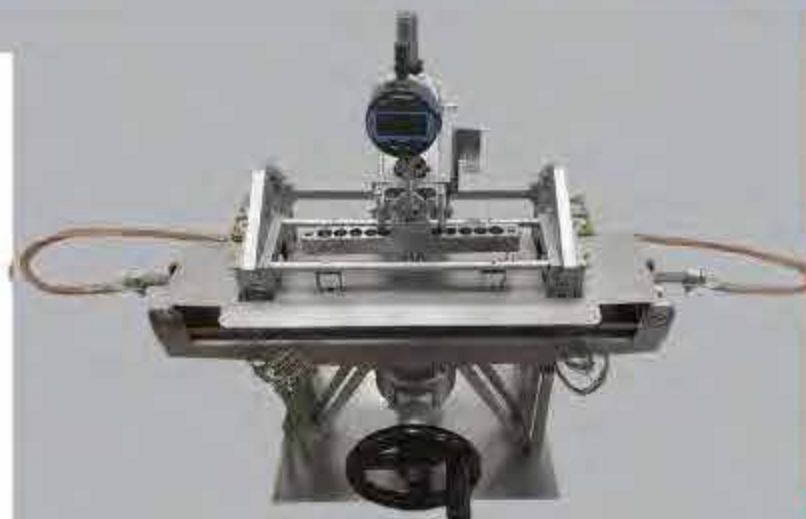
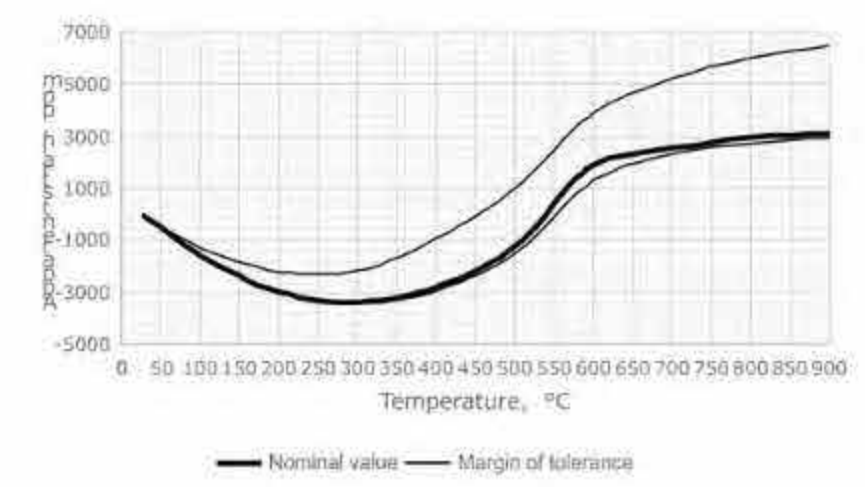
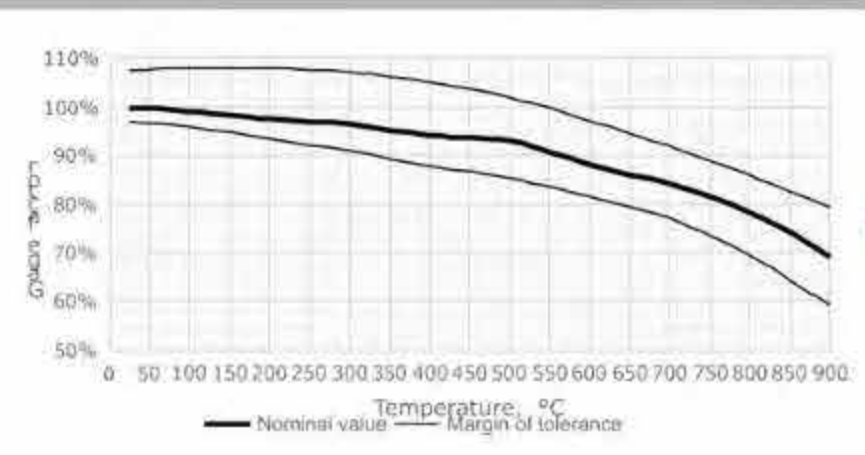
Fatigue life:
 10⁷ at 1400 MPa (200,000 psi) at 1100°C.

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Diagram 1. Gage factor dependence on the temperature:

Diagram 2. Apparent strain dependence on the temperature:



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 Lead wires are made of 0.25 mm diameter (0.010 inch) diameter wires. Lead wires are fixed in metal or the other suitable insulation material of the lead wires is epoxy-resin or other suitable material.
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STF 120 - 3 AA-A 1150 - F 010 - 50

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STF 120-3 AA-A 1150-010-50	350	10	20	50
STF 120-3 AA-A 1150-010-100	350	10	20	100
STF 120-3 AA-A 1150-010-150	350	10	20	150
STF 120-3 AA-A 1150-010-200	350	10	20	200

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 Individual strain gages are supplied in plastic or glass carriers. Carriers with adhesive film are supplied with the gage during transportation. Single gages are packed in plastic bags. 25 pieces of 10 pieces (each group packing) are packed with the same parameters of the gages, including resistance range of the gages, gage factor, impedance, etc.

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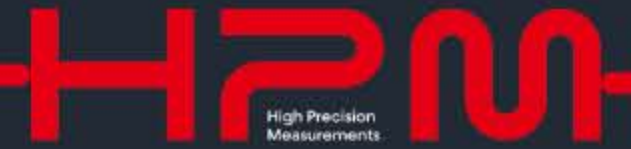
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Rev. 03
 September

Diagram 1. Gage factor dependence on the temperature:

Diagram 2. Apparent strain dependence on the temperature:

GAGES ARE COMPATIBLE WITH ALL CERAMIC CEMENTS AND ALUMINA FLAME SPRAY



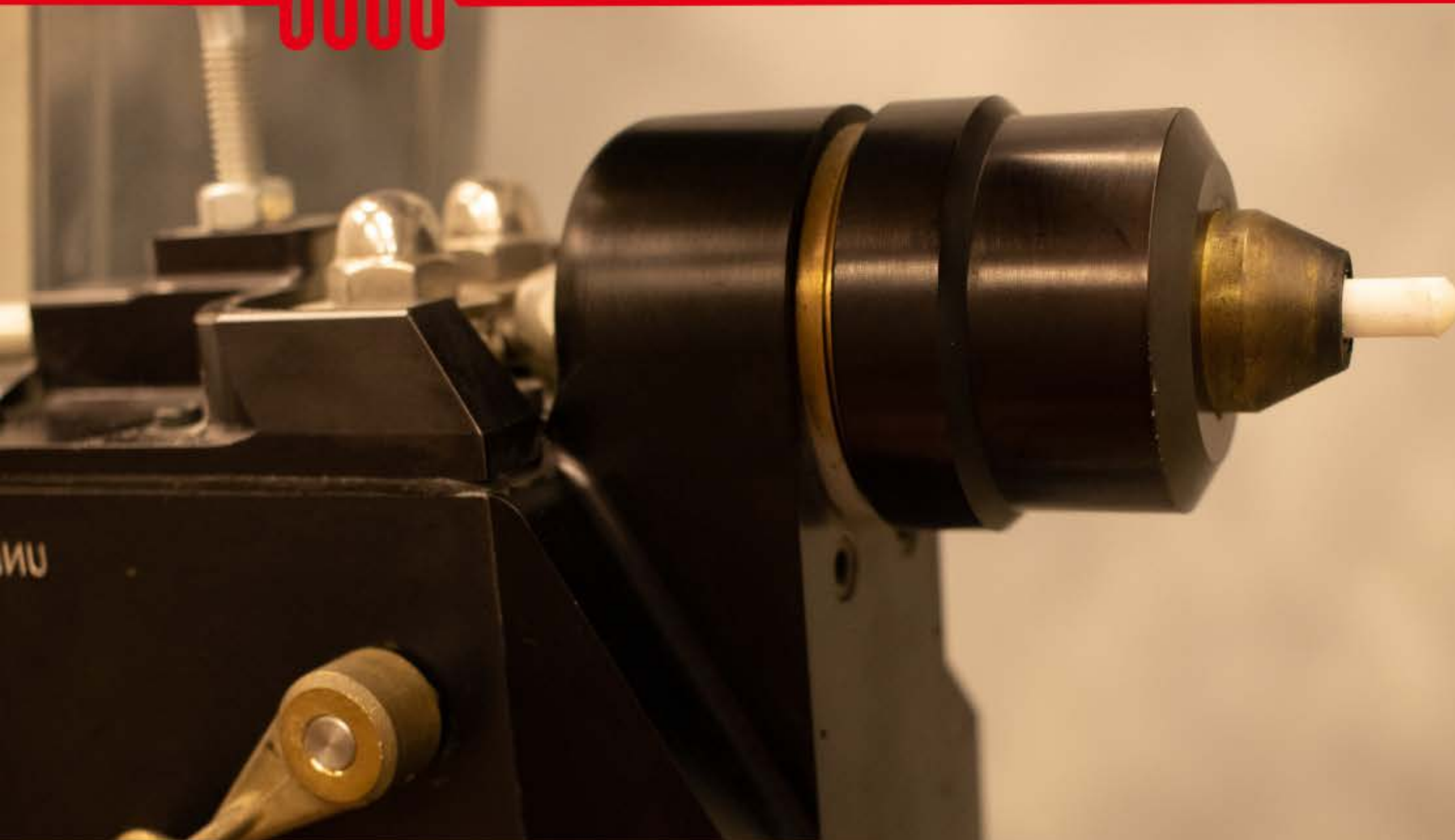
Tested for compatibility with:

- HPM:
- CC-2
- Hitecprod/Vishay:
- HG-1
- 701 cement
- NCC-3

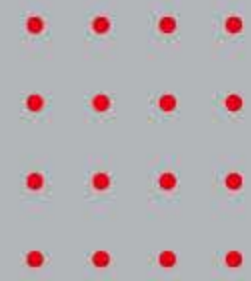


ALUMINA RODS FOR FLAME SPRAYING

HPM
High Precision
Measurements



Material: Al₂O₃
Purity: 99.7%
Diameter: 6.25 mm ± 0.1mm
Length: 450 mm or 630 mm



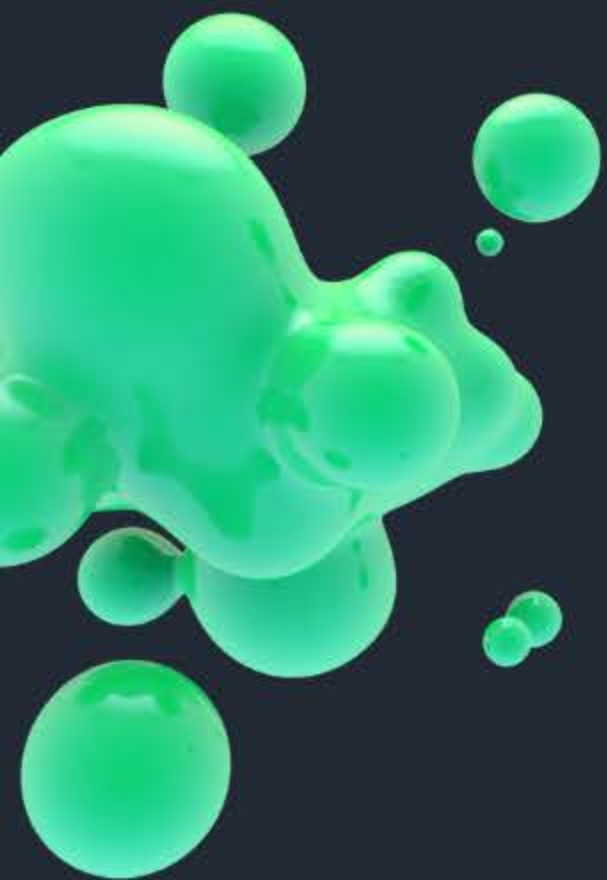
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ADHESIVES FOR HIGH-TEMPERATURE GAGES



CEMENT GLUE HPM CC-2



Temperature range:

Long-term up to $+900^{\circ}\text{C}$

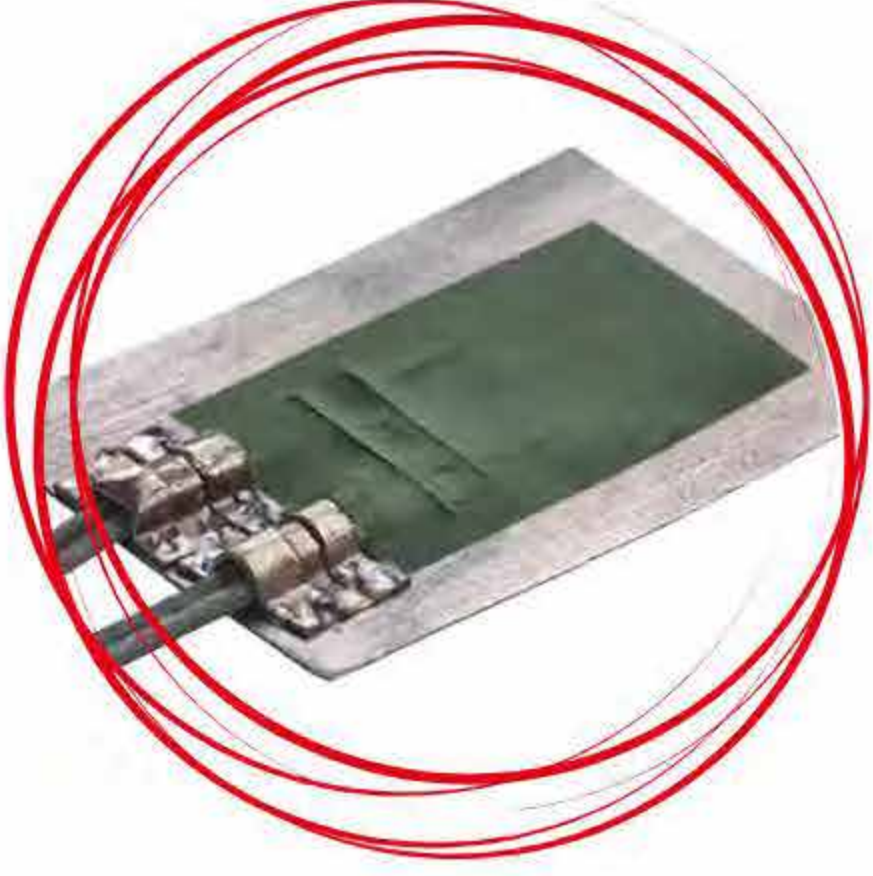
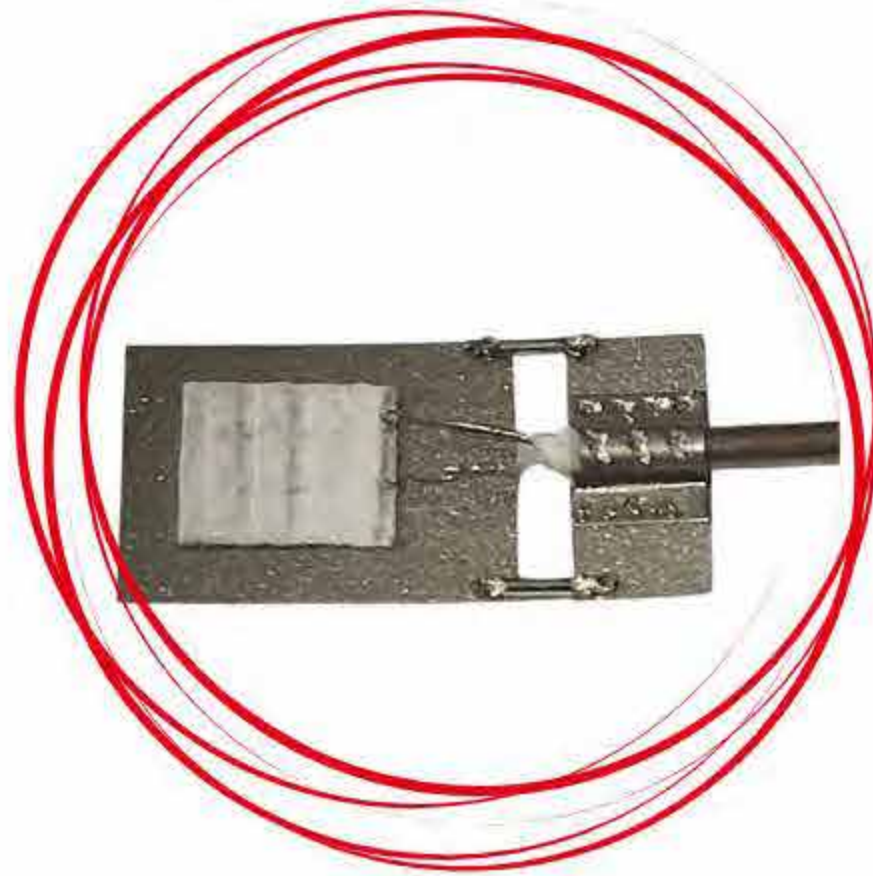
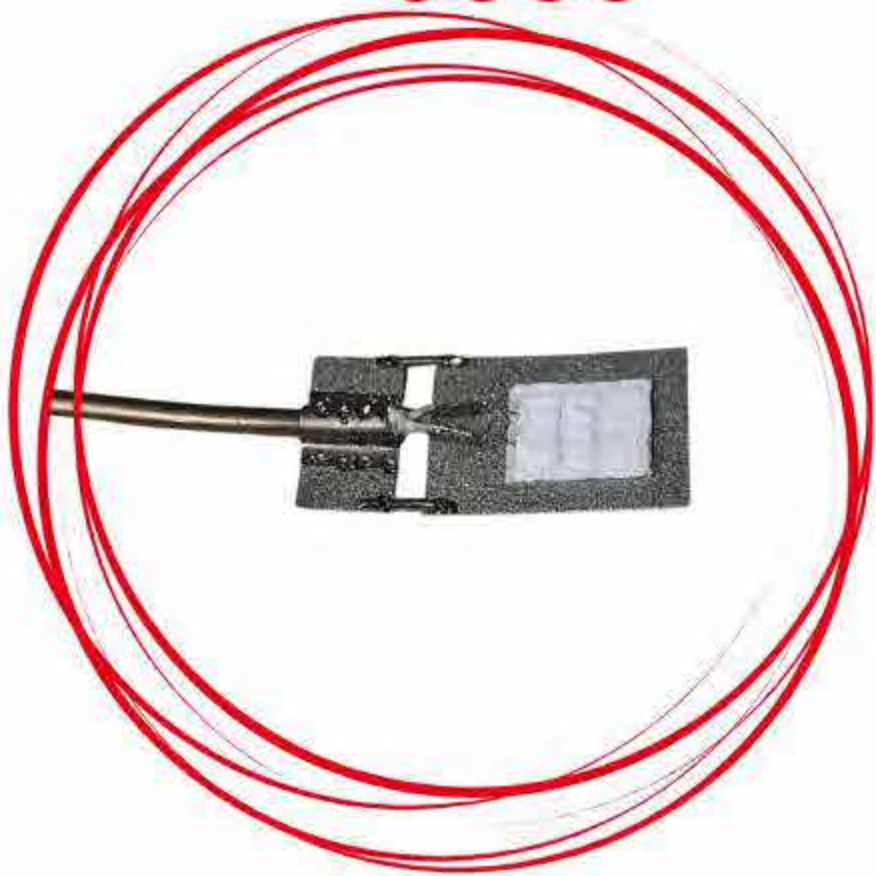
Short-term up to $+950^{\circ}\text{C}$

Shelf Life: 9 months



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WELDABLE STRAIN GAGES



- Weldable foil strain gauges for mid-range

Max. temperature +350°C

- High-temperature weldable strain gages
(bonded by ceramic cement or Alumina
spayed)

Max.temperature +800°C



CONSUMABLES FOR HIGH-TEMPERATURE GAGES INSTALLATION



Consumables kit for installation of 500 strain gages

Toolset for strain gages installation

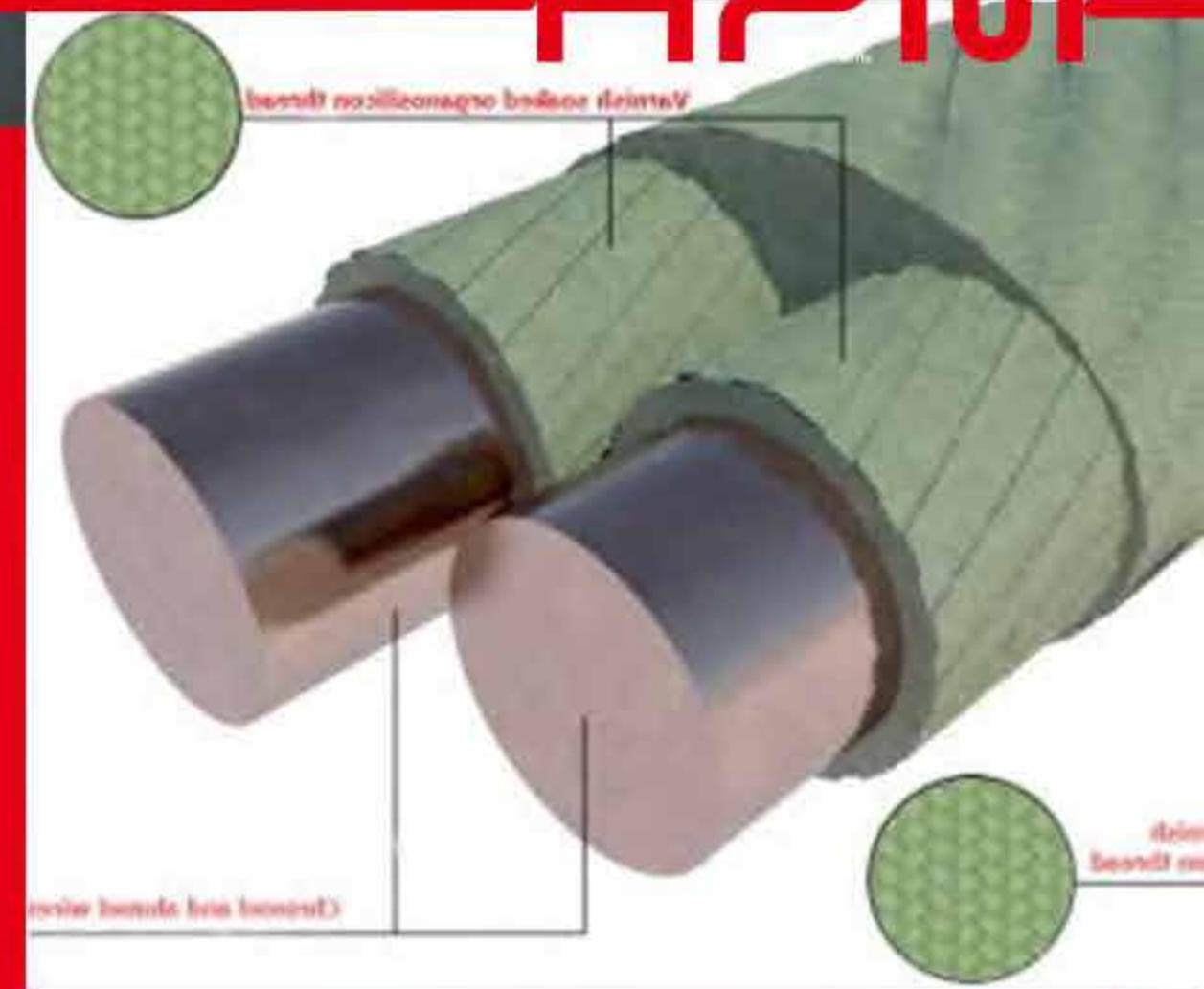


HPM HIGH TEMPERATURE WIRE



HPM

Long term working temperature range: C°	-60°C to +900°C
Applications	1. Thermocouple 2. Strain gage elongation wires
Short term working temperature range: C°	-60°C to +1 200°C
Material of conductor	Thermocouple chromel-alumel (type K)
Number of insulation layers	2
Thickness of insulation	0.3 mm
Conductor diameter	0.2 mm





HPM
High Precision
Measurements

HPM TOOLS FOR MEASUREMENTS AND SIGNAL TRANSMISSION

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Tuning fork calibration device TFGD-4001-OM

Application:

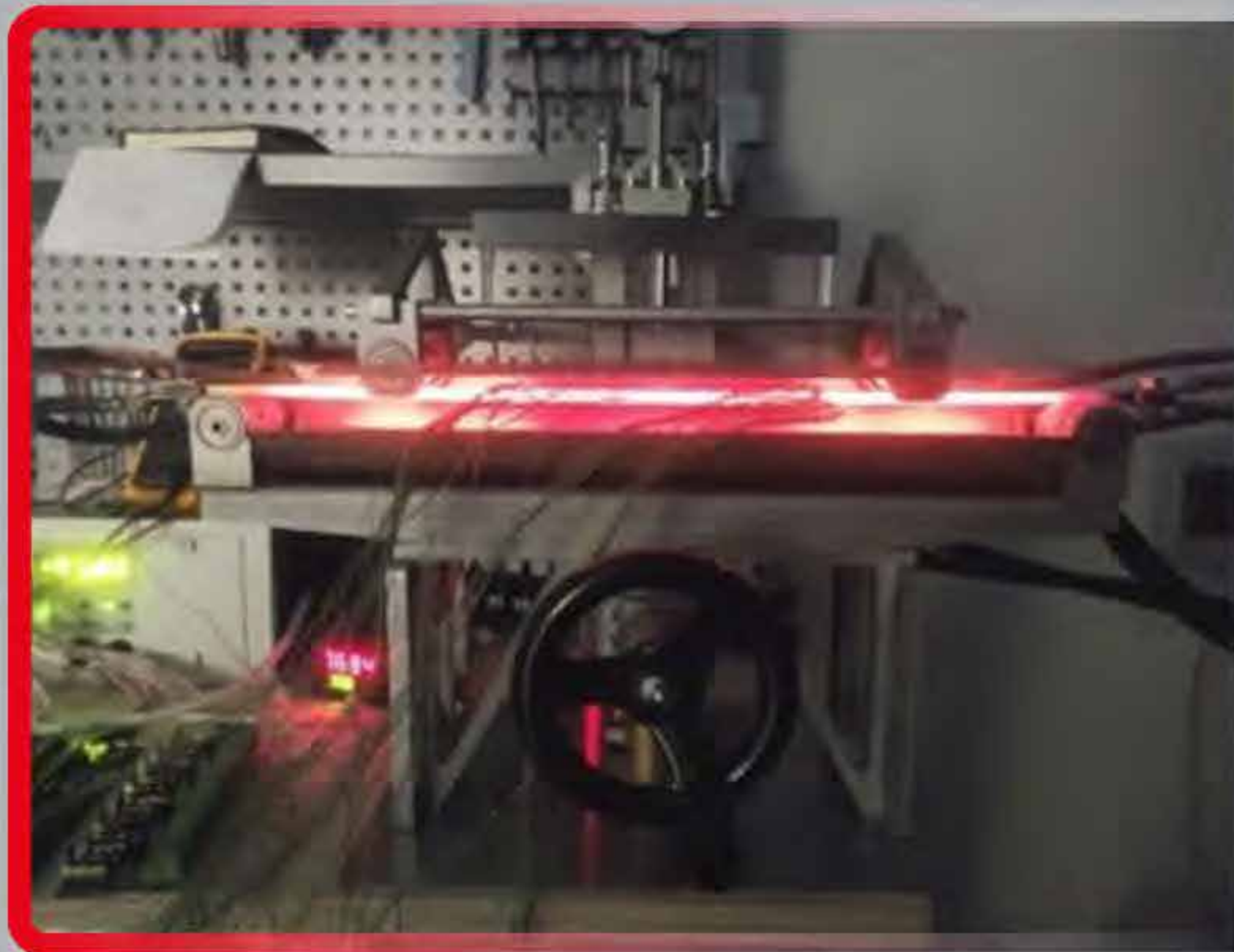
- 1. Calibration of measurement lines**
 - 2. Fatigue life test**
- Number of tuning forks: on customer's demand**
 - Accuracy: $\pm 1 \cdot 10^{-5}$**
 - Max allowed load: 20kgs/mm²**
 - Strain gage base length: 0.5 ... 10mm**
 - Power supply 220V 40 W**
 - Mechanical protection of inner parts from tuning fork vibration**



HPM PROPRIETARY DEVELOPMENT



Tool for reproducing of deformations at high temperatures



Graduation beam dimensions L*W*H, mm	600*30*8
Graduation beam material	Ni-based superalloy
Test temperature, °C	RT to 800 (1000)
Beam deflection measurement base	200 mm
Deflection meter resolution	1 pm
Max. deformation	3000 ppm
Number of strain gages tested	12 (max.16)

Heat shields for deflection meter protection

Ultra-low voltage heating of the beam (5V only !)

Time from RT to 1000 °C with stabilization - below 30 min !

Measured parameters: heat output and gage factor

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HPM PROPRIETARY DEVELOPMENT



- High precision programmable furnace for thermal treatment of adhesives



Max. operating temperature	1) Up to 500°C; 2) Up to 1200°C
Max. inner size*	600*600*600 mm
Power consumption	~ 6 kW
Max. increase of environment temperature at max. temperature	< 25 °C
Thermocouple type, qty*	K-type, 2 pcs.
Temperature control accuracy	±0.1°C
Temperature fluctuation	±0.1°C
Number of programs for adhesives curing*	> 30





- Portable welding tool
- CDWT - 6001



Application	Installation of weldable strain gages, thermocouples, foil shields
Control block dimensions	56*180*52 mm
Control block weight	0.7 kg
Length of ground clamp cable/welding gun cable	0.7 m/1 m
Max. thickness of welded foil	0.25 mm
Battery type	Li-ion, 550 OmAh
Battery performance	>2000 welding spots on 0.1 mm foil
Charging type	USB type C



COMELPRO/RESONANS PROPRIETARY DEVELOPMENT

H2M
High Precision
Measurement



- 4 to 56 channels
- Battery powered
- Test data saved on SD card
- Rotor speed up to 3,000 rpm



- 8 to 16 channels
- Dynamic or static strain gage connection (multiple of 8 channels)
- Signal frequency 20 Hz to 22 kHz
- Rotor speed up to 60,000 rpm

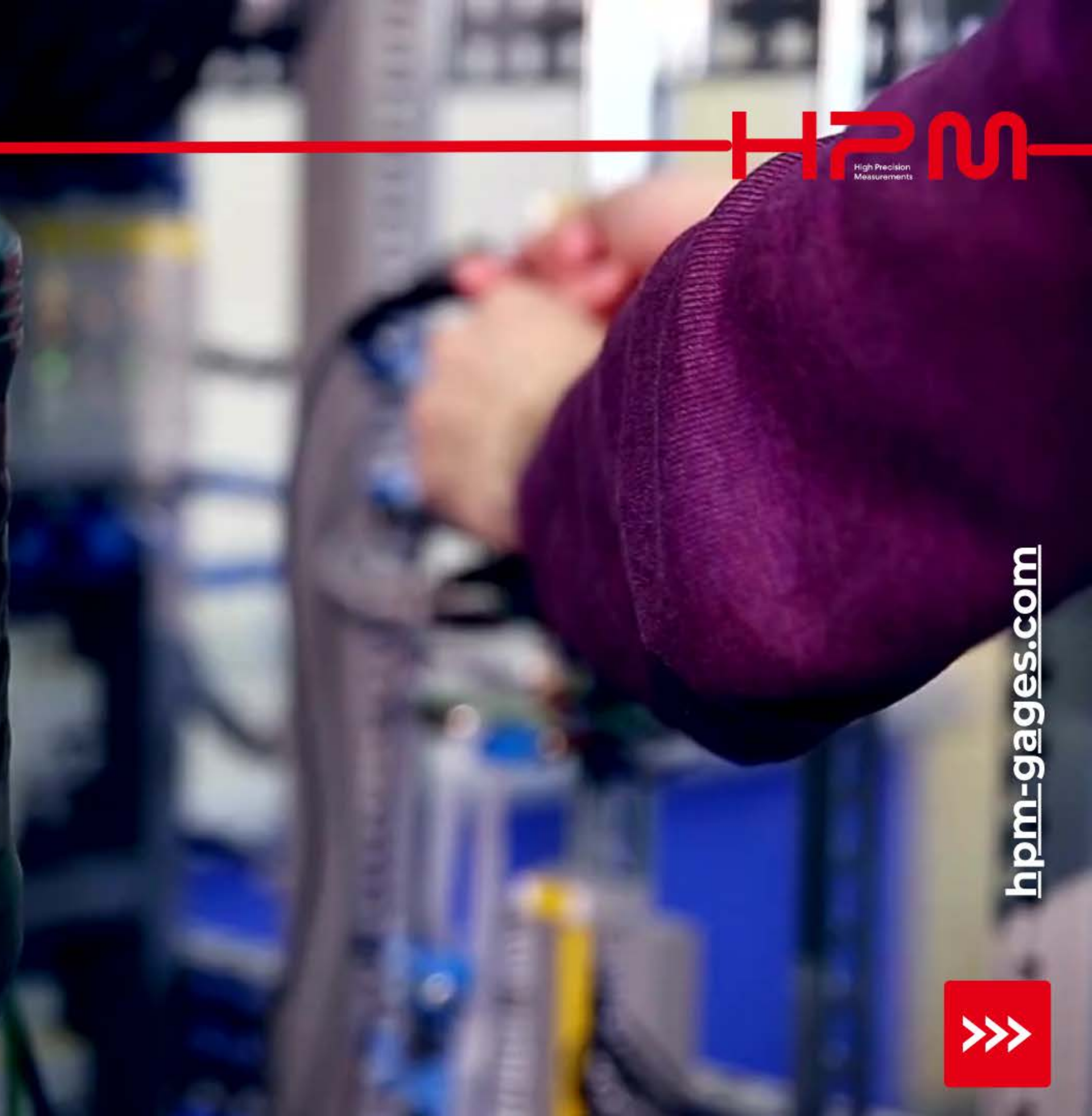


- 8 to 56 channels
- Dynamic or static strain gage connection (multiple of 8 channels)
- Signal frequency 20 Hz to 22 kHz
- Rotor speed up to 30,000 rpm





HPM SERVICES





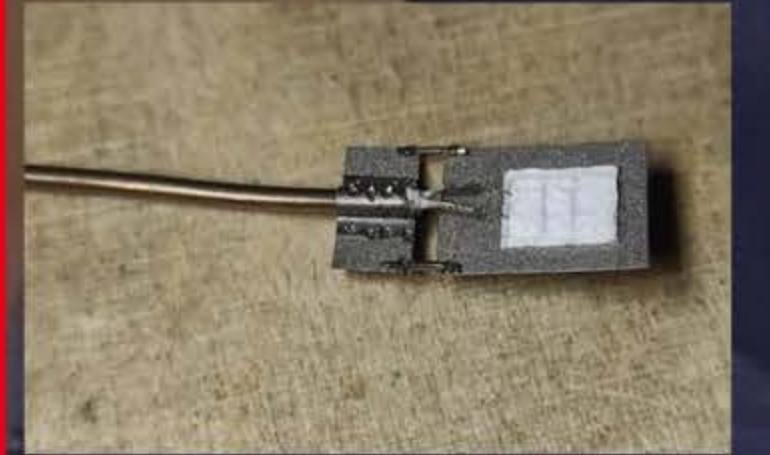
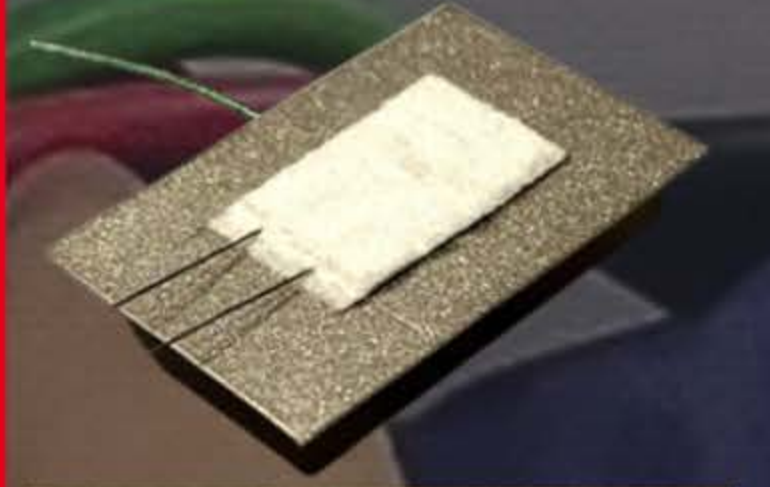
- • • • We have all necessary equipment for pasting and thermal curing of all kinds of adhesives, including ceramic cements



- Preparation of details (sandblasting, polishing)
- Installation of foil strain gages
- Installation of high temperature strain gages
- Installation of thermocouples
- Pasting and decoding of thermal paint
- Soldering and welding of custom wires

ROKIDE INSTRUMENTATION SERVICES

H2M
High Precision
Measurements



hpm-gages.com

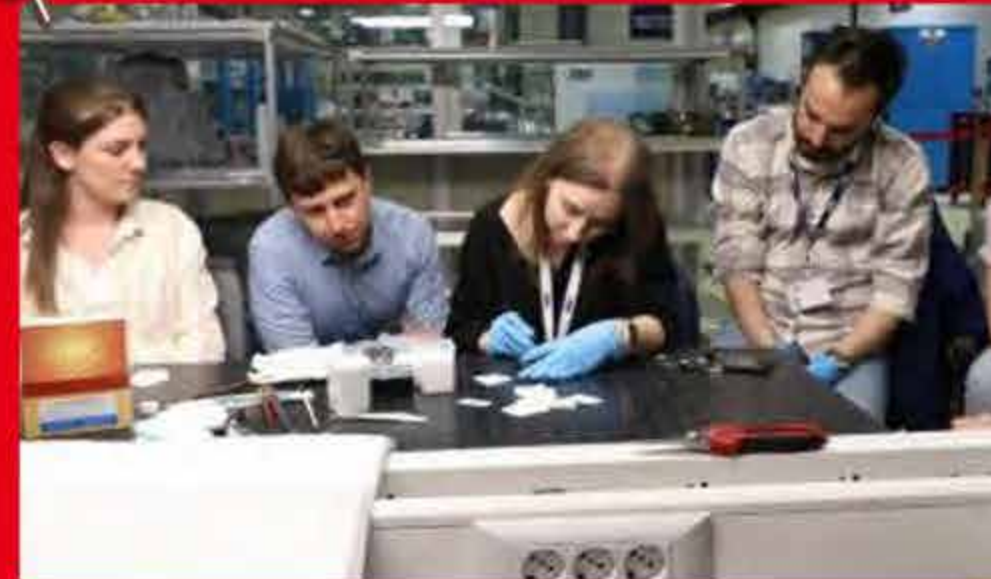


CONSULTING SERVICES



Thanks to outstanding experience in jet engine industry, our specialists can provide a literate consultation on your problematics

- Installation and application recommendation
- Signal interpretation
- Desing of auxiliary tools, clamps and loading mechanisms
- Fatigue test and high temperature test of strain gages (thermal output and load signal)





2025

**THANK YOU
FOR
YOUR ATTENTION!**

