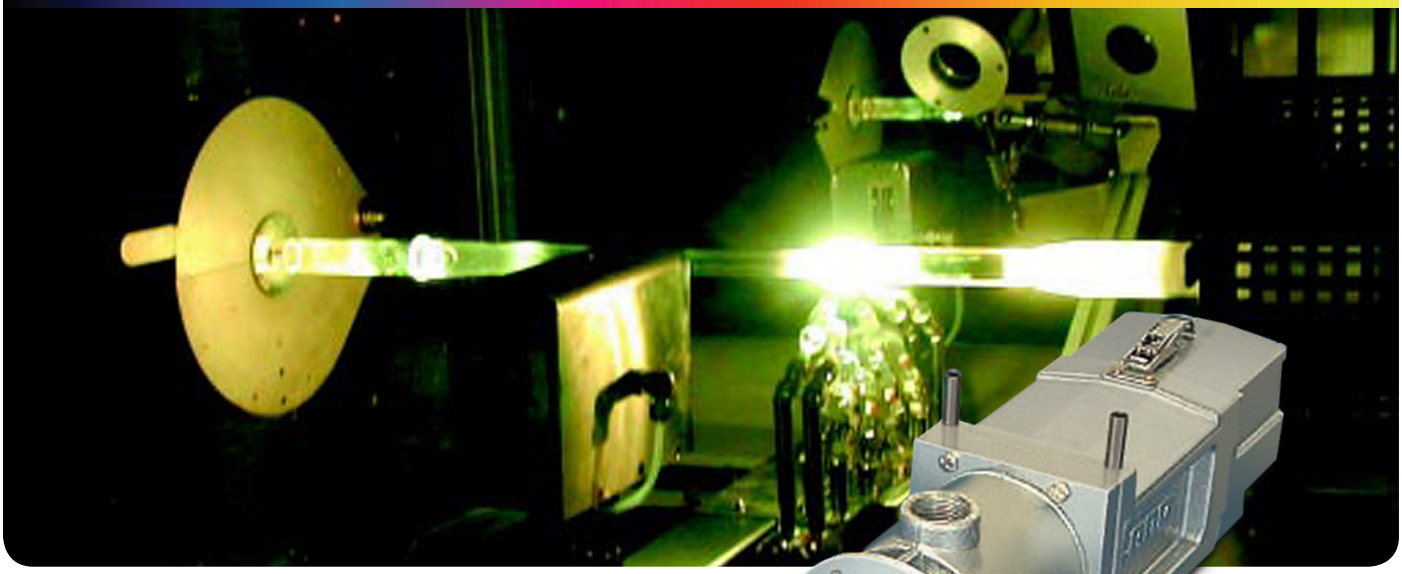
Measuring Optical Fibre Preform Temperature



Efficient, high yield production of low loss, high bandwidth optical fibre for telecommunication...

...demands precise measurement and control of preform temperature during the various deposition processes employed.

The temperature of the preform in the burner zone, where the deposition takes place, is one of the critical control parameters which determines fibre strength and transmission quality.

Measurement Problems

The deposition process can be accomplished in various ways i.e. Inside Vapour Deposition (I.V.D.P.), Outside Vapour Deposition (O.V.D.P.), Modified Chemical Vapour Deposition (M.C.V.D.).

The Vapour Deposition Thermometer (VDT) must be able to sight precisely onto the rotating preform and avoid the effects of the flames, as the burner is traversed along the lathe.

Accurate surface temperature measurement can only be achieved using dedicated non contact radiation thermometers such as the LAND VDT.

Over twenty years of experience in this application has shown that thermometers operating in the waveband 4.8 to 5.2µm are the most suitable.

In this waveband, the preform is opaque and the measurement unaffected by the flames.

An accurate sighting facility and small target capability given by focusable 100:1 optics.

Individually calibrated thermometers are available with traceability to National Standards. UKAS or NIST Calibration certificates are available.

Features

- **Focusable, through-the-lens sighting - optional laser targeting is available**
- **Wide range of highly effective mounting accessories**
- **Rugged, flexible, modular design**
- **Accurate, reliable, drift-free measurement**
- **Industry standard outputs to suit any process monitoring, recording or control system**

Specifications Vapour Deposition Thermometer - Stand Alone Thermometer

Model:	VDT-U 1000/2500C	VDT-U 1800/4500F
Temperature range:	1000 to 2500°C	1800 to 4500°F
Wavelength:	4.8 to 5.2µm	
Averager response time:	Adjustable 100ms to 5s (0 to 95%)	
Peak picker:	Adjustable 1.5 to 30%/s decay	
Emissivity:	Adjustable 0.10 to 1.00	
Output:	4 to 20mA	
Sighting: Target size: Magnification:	6°, through the lens >98% of energy within graticule image 1.8x	
Eye relief:	30mm	1.2in
Field of view (Nominal):	100:1	
Minimum target size:	3.5mm diameter	0.13in diameter
Focus range:	0.35m to 1m (Variable focus)	13.6in to 39.4in (Variable focus)
Accuracy Repeatability:	≤1°C	≤2°F
Absolute:	0.6%K	
Stability Temperature:	<0.025%T(K)/K	
Time:	2°C/year	4°F/year
Power supply:	23 to 48V d.c., ≤200mA	
Vibration:	3g any axis, 10 to 300Hz	
Humidity:	0 to 99% non condensing	
Sealing:	To IP65 requirements	To NEMA 4X requirements
Ambient temperature Specified: Operating:	 0 to 70°C -10 to 80°C	 32 to 158°F 14 to 176°F
CE:	EN 50-082-2 (immunity), EN 50-081-1 (emission), IEC 1010 (safety)	

Vapour Deposition Thermometer System - Single and Multiple Thermometers with LANDMARK GRAPHIC Signal Processor

Model:	VDT-S 1000/2500C	VDT-S 1800/4500F
Temperature range:	1000 to 2500°C	1800 to 4500°F
Wavelength:	4.8 to 5.2µm	
Averager response time:	100ms	
Output:	4 to 20mA	
Sighting: Target size: Magnification:	6°, through the lens >98% of energy within graticule image 1.8x	
Eye relief:	30mm	1.2in
Field of view (Nominal):	100:1	
Minimum target size:	3.5mm diameter	0.13in diameter
Focus range:	0.35m to 1m (Variable focus)	13.6in to 39.4in (Variable focus)
Accuracy Repeatability: Absolute:	 1K 0.5%K	
Stability Temperature:	<0.02%K/K	
Time:	2°C/year	4°F/year
Power supply:	23 to 48V d.c., ≤200mA	
Vibration:	3g any axis, 60 to 300Hz	
Humidity:	0 to 99% non condensing	
Sealing:	To IP65 requirements	To NEMA 4X requirements
Ambient temperature Specified: Operating:	 0 to 70°C -10 to 80°C	 32 to 158°F 14 to 176°F
CE:	EN 50-082-2 (immunity), EN 50-081-1 (emission), IEC 1010 (safety)	

LAND

Non-Contact Temperature Measurement Solutions

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