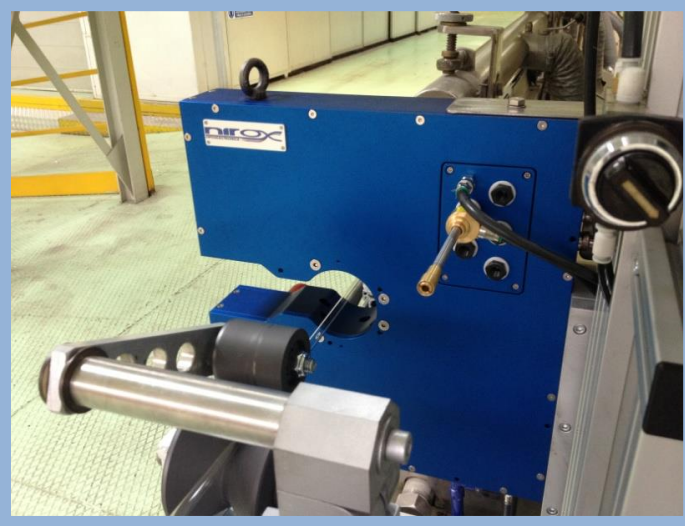


# Inspection systems for glass tubes

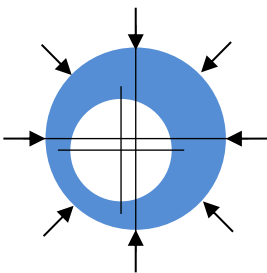
## SYSTEM DESCRIPTION



We can provide a patented complete solution for the dimensional inspection of tubular products, comprising the following parts:

- m-thick optical sensor for wall-thickness
- fixture with simple adjustment
- frame with motorized vertical centering
- high-level, user-friendly operator interface
- laser micrometer for outer diameter

## MULTI-HEAD WALL AND CONCENTRICITY



The multi-head layout around the tube allows the direct measurements of wall-thickness profile at several points; thus the determination of the minimum and maximum thickness and calculation of concentricity is easily performed.

## BENEFITS

- **Multi-heads optical sensor for wall-thickness**
- **Laser micrometer for outer diameter**
- **Full dimensional measurements**
- **24/7 inspection**
- **User-friendly interface**

## INNER DIAMETER MEASUREMENTS

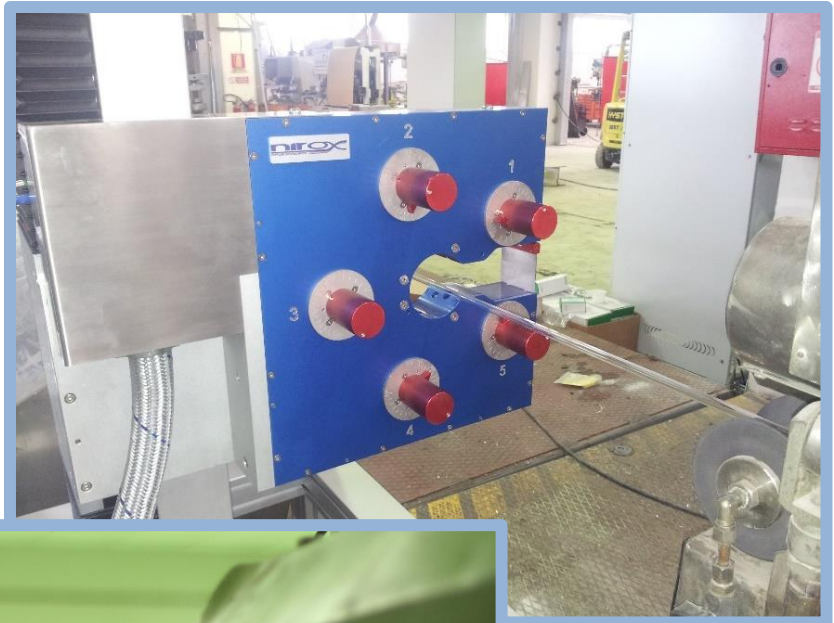
The inner diameter of the tube can play a fundamental role in some applications.

The interferometric optical sensor measures the wall thickness (WT) of the tube.

The outer diameter (OD) is measured with laser micrometer.

The inner diameter (ID) is then easy to calculate as a function of the difference.





## FIXTURE - TECHNICAL SPECIFICATIONS

Two standard models are available with 3 or 5 optical heads. Custom fixture designs are also possible according to specific requirements.

Specification	HG-3	HG-5
standard number of optical heads	3	5
clearance	60 mm	40 mm
tube OD range	5 - 50 mm	6 - 35 mm
working distance adjustment	rotating knob with OD indicator	
internal cooling	Yes	
optics self-cleaning	Yes	
size	380 x 400 x 79 mm	380 x 400 x 89 mm

## FRAME - TECHNICAL SPECIFICATIONS

The below table lists the main specifications of the standard frame. Custom solutions are also possible.

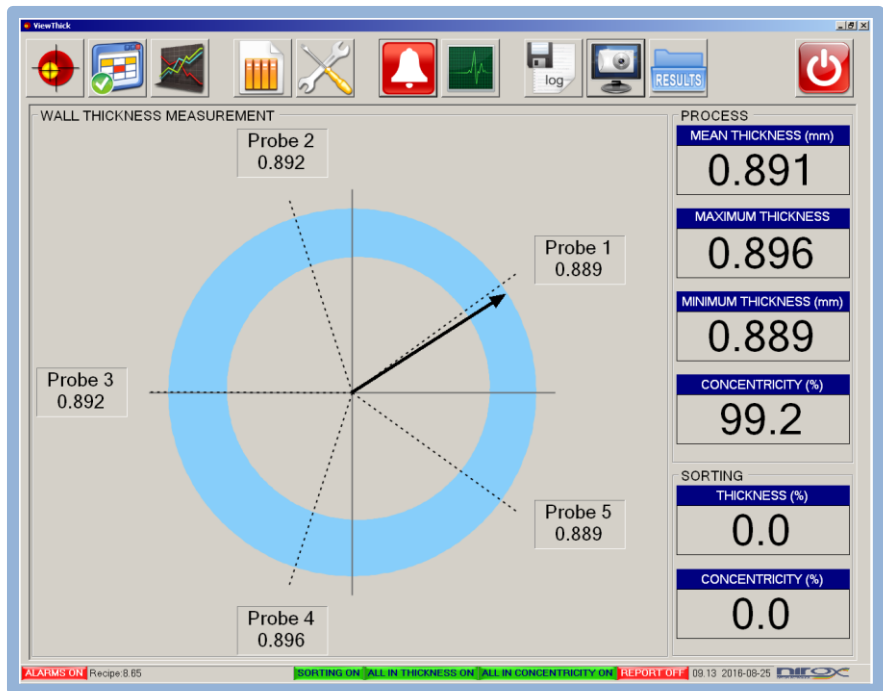
Specification	Value
Base footprint	94x114 cm
Z-axis motorized travel	32 cm
Pull-out manual travel	52 cm
Automation	B&R
Stop position	Yes, with fine adjustment

## VIEWTHICK CONTROL SOFTWARE

ViewThick is the user-friendly control software and operator interface.

All real-time measurements are visible in the main page, which also shows a graphical representation of the centering of the tube.

- Tube section drawing
- Time-trend charts
- Recipe manager
- Data logging
- Reporting



The chart page displays the time trends of the measured value for process overview. The different products and related information are managed through a recipe-style Alarms and digital output are configured through the software according to the requirements.

NIRIX s.r.l.		REPORT	
RIFERIMENTI PRODOTTO		09-02-12 14.01.31	
LINEA :	OPERATORE :		
PRODOTTO :	BORNA :	1	
DIAMETRO NOMINALE [mm] :	6.48	TOLLERANZA DIAMETRO [mm] :	0.1
SPESORE NOMINALE [mm] :	1.25	TOLLERANZA SPESORE [mm] :	0.15
		TOLLERANZA TTV [mm] :	0.15
ISTOGRAMMA TTV			
DA	A	NMIS	SP
0	0.011	0	0
0.011	0.022	0	0
0.022	0.033	8	
0.033	0.044	52	
0.044	0.055	36	
0.055	0.066	4	
0.066	0.077	0	
0.077	0.088	0	
0.088	0.099	0	
0.099	0.11	0	
0.11	0.121	0	
0.121	0.132	0	
0.132	0.143	0	
0.143	0.154	0	TOL+
0.154	0.165	0	
0.165	0.176	0	
0.176	0.187	0	
0.187	0.198	0	
0.198	0.209	0	
0.209	0.22	0	
0.22	0.231	0	
0.231	0.242	0	
0.242	0.253	0	
0.253	0.264	0	
0.264	0.275	0	
0.275	0.286	0	
0.286	0.297	0	
0.297	0.308	0	
0.308	0.319	0	
0.319	+INF	0	
DATI RIASSUNTIVI			
ACQUISIZIONE	ORA INIZIO :	12.29.35	ORA FINE :
			14.01.31
SPESORE	MEDIO [mm] :	1.206	DEV. ST. [µm] :
	MINIMO [mm] :	1.163	MASSIMO [mm] :
	Cp :	3.88	Cpk :
			2.74
TTV	MEDIO [mm] :	0.042	DEV. ST. [µm] :
	MINIMO [mm] :	0.024	MASSIMO [mm] :
	Cp :	6.94	Cpk :
			0.955
DIAMETRO	MEDIO [mm] :	6.475	DEV. ST. [µm] :
	MINIMO [mm] :	6.425	MASSIMO [mm] :
	Cp :	2.54	Cpk :
			2.42

The system creates reports with a selectable time cadence; each document contains batch and product information, data histograms, base statistic and process capability indices.

Documents are saved on the internal memory, sent out to a printer or to the plant data storage.



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