

# Micro Test HS

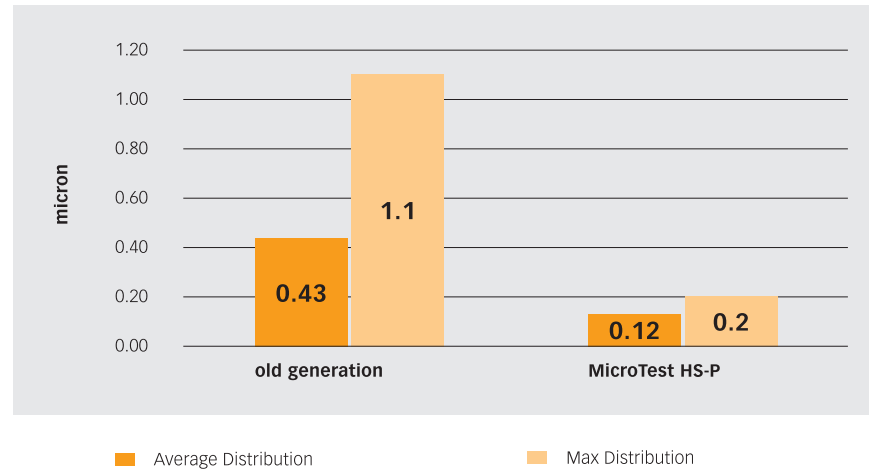
www.microcut.ch

## Measurement precision (repeatability and reproducibility)

720 Measurements on 30 parts with 2 different equipments and 4 different users has been made with MicroTest machines. Setup done by the different users.

**Average Standard Deviation:**  
MicroTest HS-P: 0.042  $\mu\text{m}$

**Average Distribution:**  
MicroTest HS-P: 0.123  $\mu\text{m}$



## Measurement trueness

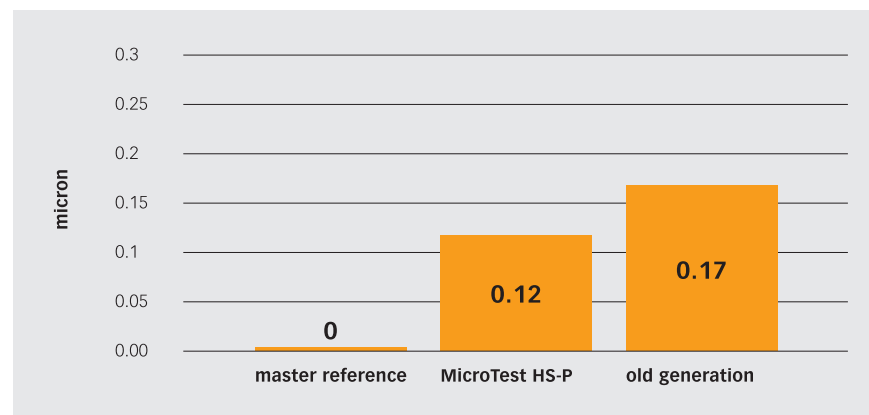
This diagram shows the average absolute difference of measured value of MicroTest Machine to certified master form measuring machine (Taylor Hobson Taly Rond) (calculated concentricity value only)

Please note, that MicroTest value include ID and partial OD roundness aspects which are relevant for performance of connector

15 different work pieces with concentricity value from 0.2 to 1.7  $\mu\text{m}$  (average 0.9  $\mu\text{m}$ ) have been measured 3 times.

### Measurement Accuracy (precision + trueness)

Based on the superior precision and the proven trueness of measured values, best accuracy of MicroTest HS-P is given.



## User benefits

### Minimize cost per measurement

- Increase throughput
- Minimized cycle time -> less amount of equipment; less labour cost
- Measure under industrial condition close to fabrication
- Minimized setup and calibration time (assisted setup)
- Maximized reliability and accuracy (less re- testing and comparison testing)
- choose specific machine fitting your needs



### Increase value of measurement

- Improve reliability and accuracy of measurement
- Dirt tolerant tactile measurement
- Measure close to function (Measure inside the bore at defined depth of termination)
- Document your measuring results automatically and easily
- Make sharp margins in between categories
- Use the market reference measuring machine



### Avoid hidden costs because of ID angle problems

- measure the angle of bore in order to have better image of the performance of your finished product:

- **The angle of the ID has at the concentricity a significant impact on the performance of an FO Ferrule.**



- Analyse your injection mould tool before producing bad blanks
- Detect blanks- problems before machining them costly
- Detect ID angle problems on your Ferrule before terminate the connector costly



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Subject to modifications



THE CUTTING EDGE OF A MICRON

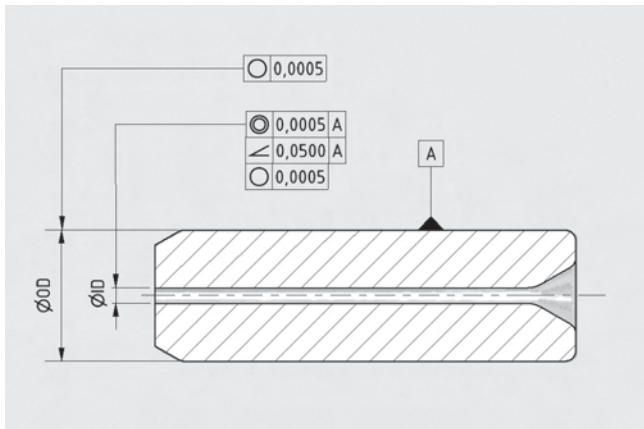
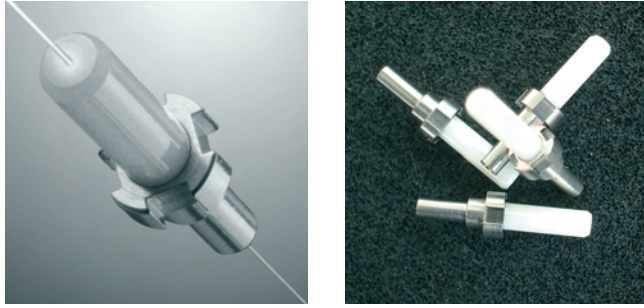
# Micro Test HS

concentricity | roundness | bore angle testing

The **MicroTest HS-series** allows a precise and automatic qualification of small cylindrical parts with relevant concentric geometries. A success story in ferrule concentricity testing continues with the latest Microcut® development.



## Typical workpieces

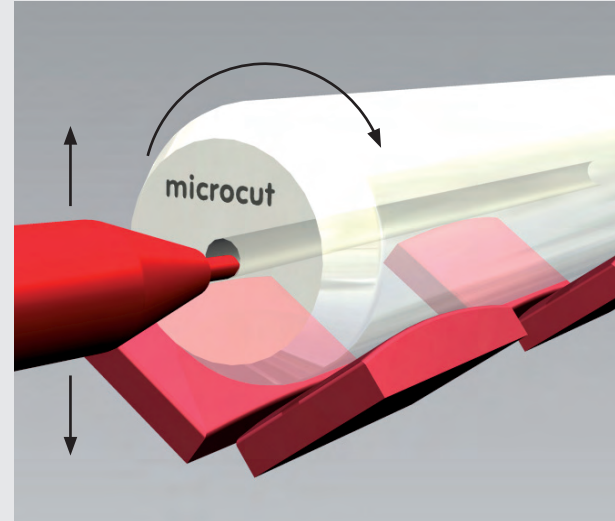


Ferrules for fiberoptic connectors

## System advantages

- Shortest measurement cycle time
- Close to function testing method (you measure what really matters)
- Dirt tolerant tactile measuring method (dirt particles or film is wiped away by the measuring probe)
- High precision (repeatability) and high reproducibility
  - High precision measuring head
  - High precision mechanics (repeatability of setup)
  - Diamond work piece support (no jumping effect of work piece)
  - Automated X axis drive, automatic Zero point search
  - Semiautomatic setup procedures / step by step instructions (minimum user influence/ same results from unit to unit)
  - Less parameters to set (same results from unit to unit)
  - Excellent vibration insulation (HS-P)
- High trueness + high precision = high accuracy
  - Comparative measurements with certified master form measuring machine are proofing accuracy of MicroTest results (please refer to diagram)
  - Semi automatic calibration and calibration check procedures
- Specific machine types and custom specific machines available
  - Single (manual) and automated feeding and sorting
  - Automatic quality selection groups 1 – 4
- Data collecting to USB stick
  - Direct import to MS Excel sheet
- Customized solutions available
  - All in house engineering support for customized solutions and automation
- Easy operation
  - Step by step guided setup procedures and zero point search routines

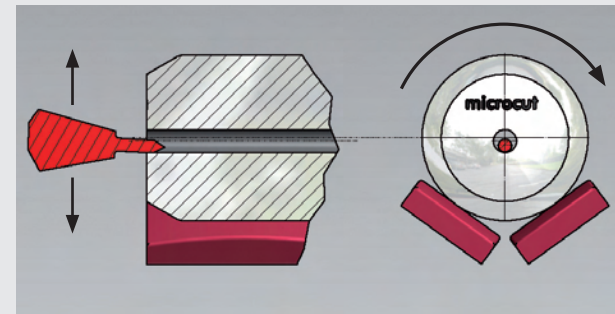
## System description / measuring principle



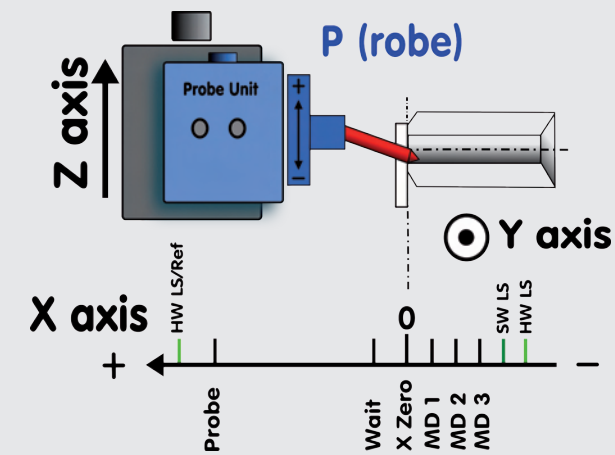
Tactile concentricity / runout, roundness and bore-angle testing equipment

Measuring probe enters mechanically into the concentric bore of the work piece to defined depth (e.g. 0.1 mm)

The work piece rotates around the axis of OD



The measuring probe follows the motion of the bore, caused by the eccentricity of the bore. Dirt particles and layers are wiped away.



- Programmable measuring depth
- Auto Zero Position procedure

## HS-P

### Manual load unload / sorting

Small separated housing allows individual ergonomic positioning for manual operation



Basic measuring unit suitable for later upgrade

### Automatic feeding

Pick and place: Exposed work piece support allowing short stroke and easy access of handling unit. Measuring unit is separated from control unit in order to be placed in closed automation cell.

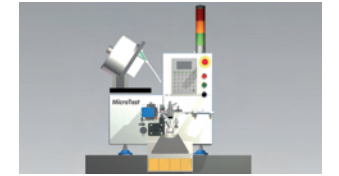


Specific pallet to pallet / blister handling system by microcut (high speed)

## HS-A

### Automatic feeding

bulk feeding and sorting



Robot / custom Handling by customer or microcut

Bulk feeding for in production measurement

## Technical specifications

Concentricity / Run-off / Roundness measurements:

Displayed sorting resolution 0.1  $\mu\text{m}$

Precision (Repeatability) and Reproducibility (Average Distribution\*) please refer to chart

Diamond V Block 0.12  $\mu\text{m}$  \* (Repeatability only: 0.022 $\mu\text{m}$ )

Sapphire V Block 0.3  $\mu\text{m}$  \*

Measuring cycle time 3.5 sec

Total cycle time custom (manual / automatic) typ.: 5sec

Bore angle measurement:

Displayed resolution 0.001°

Measuring cycle time Angle: 4.5 sec (3 measurements)

Work piece specifications:

FO Ferrule kit SC kit (2.5 mm) / MU/LC kit (1.25 mm)

Max. diameter OD 3.2 mm Standard / Custom

Range of ID 0.11 – 3.0 mm / Custom

Range of length: 6 – 16.5 mm / Custom

Work piece classification system: Programmable for 4 tolerance ranges / Custom

Data Collecting interface: USB Stick MS Excel / Ethernet

Parameter back up USB Stick / Ethernet

MMI guided procedure for set up semiautomatic

MMI guided procedure for probe check semiautomatic

Conformity CE

USB Camera

Speed-up kit for manual handling

Electrical requirements: 100 – 230 VAC, 50/60 Hz

Air requirements: 5 bar dried filtered

Dimension (W x D x H): 2 units each (270 x 510 x 280 mm)

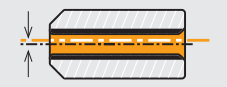
Weight: 50 kg (100 lbs)

= optional

## Tested parameters: position and form

Concentricity, Runout and Inclination (Angle), have a major impact for the insertion loss in FO connection.

Runout /Concentricity of Bore (ID) to Outer Diameter (OD)



Runout

The MicroTest measures the Runout which is including Concentricity and partial Roundness of ID and OD

The Concentricity reflects only the relation in between the axis of center of ID and OD  
Eccentricity is 1/2 of Concentricity



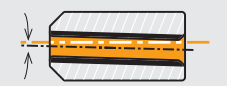
Concentricity

Angle of Bore axis to Outer Diameter axis



Angle / Inclination

The angle of the ID has as the concentricity a significant impact on the performance of an FO Ferrule



The angle of bore defines the shift of lateral misalignment (Concentricity) when polishing down the face of Ferrule

Roundness of OD (Outer Diameter) and ID (Inner Diameter)



Roundness

Typically the roundness of ID has a influence of the performance of the connector.

Typical OD form

Typical ID form

