

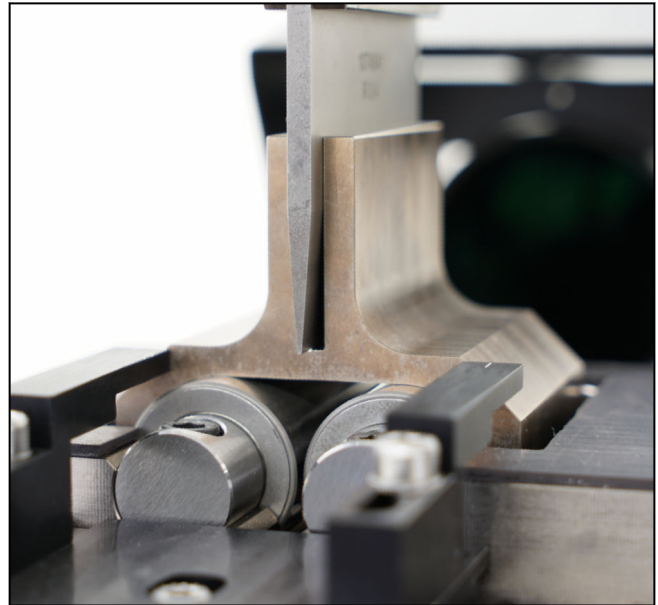
## Product Information

### 3-point flexure test kit for small plate bending test on metallic materials

CTA: 291320 290610



3-point flexure test kit for small plate bending test on metallic materials



Distance gauge for standard compliant positioning of the flexure test kit

#### Applications

The VDA 238-100:2020-07 is the basis for the test arrangement. This 3-point flexure test kit is used to perform small plate bending tests for determination of the bending angle with the goal of reaching conclusions on the deformation behavior of metal materials during forming processes with dominant bending elements (e.g. hemming operations) or during crash loading.

With the test fixture from ZwickRoell, all three methods of the VDA 238-100:2020-07 are available for the test evaluation:

- Annex C: Manual measurement of the bending angle using a protractor after the measurement
- Annex D: Software assisted calculation via crosshead movement
- Annex E: Optical measurement via high-precision camera system with additional measurement of the elastic deformation during load application on the specimen

#### Advantages and features

- High stiffness: with a punch force of 3000 N, the maximum total widening of the rollers is 0.1 mm
- Maximum test force  $F_{max}$  20 kN
- Anvil rollers, bearing mounted and surface hardened
- For specimen thicknesses up to 6 mm

- Support rollers:
  - Distance can be set steplessly from 0 to 15 mm
  - Position securement via manually operated hydraulic clamp (included in scope of delivery)
- A test evaluation to Annex E of the VDA 238-100:2020-07 is only possible with a bending angle camera. ZwickRoell thereby enables the evaluation according to all three types of determination of the bending angle (Annex C, D and E).
- Automatic measurement of the elastic and plastic portion of the bending angle saves time and reduces operator influence when compared to conventional manual processes.
- Operator influence is reduced to a minimum by using optical roller distance measurement. Measurement value transmission to testXpert documents the roller distance and ensures traceable test results.
- The correlation between force, bending angle and crack pattern can be viewed in testXpert at any time during the test, allowing for detailed analysis of the material failure. This is implemented by synchronous optical recording of the crack pattern, the bending angle and the force.
- Mounting of specimen grips and test tools without removing the test fixture by using adapters.
- Attachment points for ring bolts for use with lifting devices when mounting the 3-point flexure test kit in the testing machine.

## Product Information

### 3-point flexure test kit for small plate bending test on metallic materials

#### Technical data

Type Item No.	3-point flexure test kit 1089537	
Standard	VDA238-100:2020-07	
Test load $F_{max}$	20	kN
Dimensions		
Fixture		
Height	202	mm
Width (incl. adjustment wheel)	322 (359)	mm
Depth	248	mm
Upper anvils		
Height without connection	85	mm
Width	70	mm
Radius	0.2 and 0.4	mm
Specimen dimensions		
Length	60	mm
Width	30 ... 60	mm
Support roller distance, stepless	0 ... 15	mm
Anvil span, stepless	30 ... 45	mm
Connection, upper	Mounting stud Ø 16 mm	
Connection, lower	Pitch circle Ø 220 mm (2 x M16x35)	
Ambient temperature	+10 ... +35	°C
Weight, approx.	64	kg
Hydraulic oil		
Type	Hyspin XP 46	
Quantity	1.5	l

#### Optional accessories

##### Dial gauges for widening measurement

The dial gauges for widening measurement are used to determine the widening of the 3-point flexure test kit and thereby the stiffness. The dial gauges are mounted on the 3-point flexure test kit. The probe tips are placed against the outer sides of the closed (driven together) support rollers. The dial gauges are then adjusted.

Before starting the test, the support rollers must be driven together so that the plunging slope of the upper anvil presses them apart. The widening is determined with the upper anvil, which is driven between the support rollers until a test force of 3000 N has been reached.

By adding the measurement results of these two dial gauges, the widening of the 3-point flexure test kit is determined according to VDA238-100:2020-07.

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Type Item No.	Dial gauges for widening measurement 1089538 <sup>1)</sup>
Standard	VDA238-100:2020-07
Ambient temperature	+10 ... +35 °C
Scope of delivery	2 dial gauges 2 signal cables for dial gauges

1) Required for this: 2 x USB-Adapter

### Built-in caliper for anvil span measurement

The built-in caliper for anvil span measurement is attached to both support blocks of the 3-point flexure test kit and is used to measure the distance between the support rollers.

Type Item No.	Built-in caliper for anvil span measurement 1089539 <sup>1)</sup>
Standard	VDA238-100:2020-07
Ambient temperature	+10 ... +35 °C
Scope of delivery	1 built-in caliper with retaining plates 1 signal cable for built-in caliper

1) Required for this: 1 x USB-Adapter

### Video camera for measurement of the bending angle

The measuring system measures the anvil span and the bending angle of a specimen during the 3-point flexure test without making contact.

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3-point flexure test kit for small plate bending test on metallic materials

Type Item No.	Camera for measurement of the bending angle and the anvil span 1089541	
Field of view (FOV)	55 x 41	mm
Resolution	0.01	°
Dimensions		
Height	225	mm
Width	321	mm
Depth	370	mm
Specimen thickness	0 ... 7	mm
Support roller distance, stepless	0 ... 15	mm
Anvil span, stepless	30 ... 45	mm
Scope of delivery	Measuring head with a USB 3.0 digital camera (1.3 Mpix) Lens (telecentric) including holder Incident light lamp USB 3.0 adapter for PCIe x4 slot Scaling gauge for measurement of the anvil span Gauges for verification of the bending angle measurement Software for image acquisition and evaluation	

### videoXtens basic package (1x required for video camera for measurement of the bending angle)

Description	ArticleNumber
Basic package Windows 10 / 64 bit quad-core, includes multilingual PC workstation with Windows 10 / 64 bit core i7 processor, 27" TFT monitor, graphics card for support of two monitors, ethernet port for testControl II, testXpert III installation incl. software for videoXtens	<b>1123961</b>

### Digital bending-angle gauge

The bending-angle gauge is used to measure the bending angle after the 3-point flexure test.

Type Item No.	Manual bending-angle gauge 1089540 <sup>1)</sup>	
Rail length	150	mm
Repeat accuracy	0.01	°
Max. permissible error	0.03	°
Ambient temperature	+10 ... +35	°C
Scope of delivery	1 bending-angle gauge 1 connection cable	

1) Required for this: 1 x USB-Adapter

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### Accessories for PC connection with USB interface USB-Adapter

Description	ArticleNumber
Adapter for connection to Vernier caliper/micrometer with USB interface	<b>024952</b>

### Distance gauge for standard compliant positioning of the flexure test kit

The distance gauge is used for parallel and central alignment of the die to the support rollers and to the test axis.

Type	Distance gauge for standard compliant positioning of the flexure test kit
Item No.	<b>1096447</b>

### Crack-formation capturing

The optical camera system is used for synchronous analysis and recording of the crack formation and crack propagation on the underside of the specimen during the test.

Description	Value
Type	Crack formation capturing
Item No.	1089542
Scope of delivery	<ul style="list-style-type: none"> <li>• USB 3.0 digital camera (1.3MPix) with f=25 mm incl. holder</li> <li>• USB 3.0 adapter for PCIe x4 slot</li> <li>• Deflection mirror</li> <li>• 2 x LED lamps</li> </ul>

### Mounting stud

The mounting stud is used to hold test tools for simple materials testing, without having to remove the 3-point flexure test kit. The mounting stud is attached to the 3-point flexure test kit via a flange.

Type	Mounting stud	
Item No.	<b>1089543</b>	
Test load $F_{max}$	10	kN
Connection	Pitch circle Ø 115 (6 x M8)	
Mounting of test tools via stud	Ø 20	mm
Ambient temperature	+10 ... +35	°C
Weight, approx.	2.5	kg
Scope of delivery		
Mounting stud	1	piece
Flange	1	piece