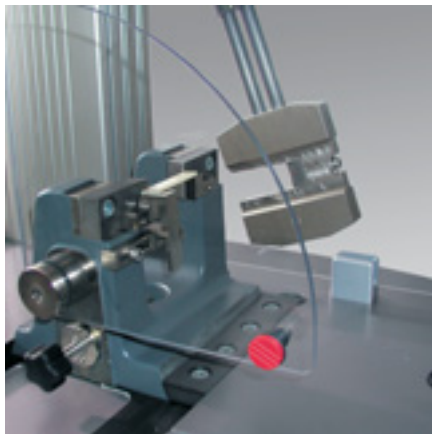
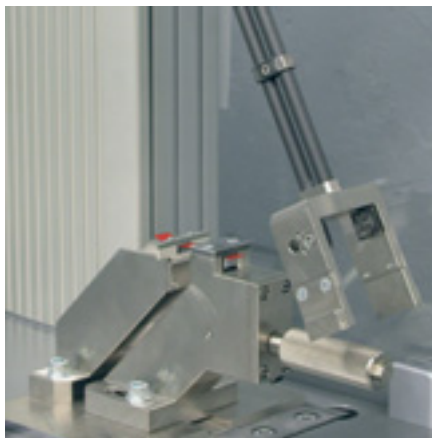


Pendulum Impact Testers HIT5.5P, HIT25P and HIT50P



FP 573 2.0107

Intelligent Testing

1. The latest Pendulum Impact Testers from Zwick are a HIT

Important Characteristics

As a leading producer of mechanical testing products, the Zwick Roell Group's HIT pendulum impact testers are powerful instruments for plastic manufacturers and processors.

The main characteristics of the HIT pendulum impact testers are their accuracy, dependability and ergonomic design. Advanced manufacturing technology enables improved accuracy specifications and brings the following innovations and benefits to users in both R+D and quality assurance:

- Pendulum coding**
 The HIT Pendulum Impact Testers automatically recognize the pendulum being used and evaluate the test values in the correct range corresponding to the relevant standard. It ensures that different pendulum sizes or test procedures are used correctly to eliminate troublesome, error prone fitting of additional pendulum masses as used by some pendulum impact testers.
- Virtually vibration free**
 A new world innovation is the use of double carbon rods for the pendulums. This gives a high stiffness in the direction of impact and a strong concentration of the mass at the impact point. Compared to single-rod, metal construction pendulums to date, and compound type pendulums the energy loss due to resonant oscillations is considerably reduced. The high stiffness gives the pendulums an excellent dynamic characteristic and prevents excessive forces in the pendulum rod during operation and if Izod specimens are only partially broken.
- Pendulum change without tools**
 Each pendulum is equipped with a quick change unit. Changing of pendulums can be carried out quickly without special tools. There are no screws which can be easily lost. This is important because a missing screw will change the pendulum energy.
- Low wear disc brake**
 The optional disc brake allows the smooth stopping of the pendulum arms.
- Ergonomic design**
 All important operating elements such as keyboard, brake, release lever and display are all at one level within easy reach of the operator.



Fig 1: Pendulum Impact Tester HIT5.5P with opened safety shield

- Modern electronics**
 The new control electronics contains a high resolution digital encoder for the precise measurement of the impact angle. For integration into laboratory management systems an RS232-interface is included. The PC connection is via an USB-upstream-interface.
- High performance PC-Software *testXpert*® II (Option)**
 offers evaluations to DIN, ISO and ASTM. Reports and data archiving are done in the normal formats of the Windows®-World.

Application Range and Standards

The HIT Pendulum Impact Testers can be used for the determination of impact resistance on plastics and other materials. The impact testers can be equipped with accessories for Charpy, Izod, Dynstat, and impact tensile according to the following standards:

Method	DIN	ISO	ASTM
Charpy	50115	179-1	D6110
Izod		180	D256 (notched) D4812 (without notch)
Impact tensile		8256 A 8256 B	D1822 (spec. in head)
Dynstat	53435 51230		

2. The HIT Pendulum Impact Testers – everything a Pendulum Impact Tester needs

Instrument models

The Pendulum Impact Testers are available in two models:

- **The Stand-Alone-Model**

This model is the ideal choice when there is no need to store the test data. The results are calculated by the Pendulum Impact Tester and can be selectively displayed as impact energy, or in absorbed energy, or in % of the pendulum's nominal energy. A clear, large display allows secure reading of the results even at greater distances.

- **The PC-Model**

The PC-Model with RS232 or USB interface is the perfect choice if test results are to be stored and/or subsequently processed. The testing software *testXpert®* II takes the test data and prepares it graphically and statistically. If an electronic vernier caliper is connected to the PC, the cross-sectional area of the specimen can be measured, transferred to the PC and the impact toughness determined. Also possible is the data link to laboratory information systems.

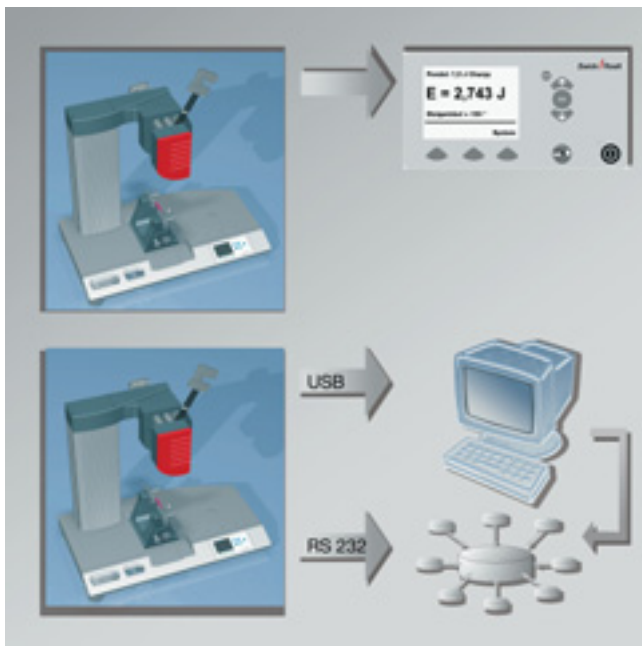


Fig. 1: HIT-Instruments-Models: Stand-Alone- and PC-Model

Low vibration instrument design

The design of the perfect low vibration Pendulum Impact Tester begins in the pendulum and the supports which are closest to the specimen. For this reason we use high performance carbon materials in the HIT Pendulums. This significantly increases the stiffness of the pendulum and brings the distribution of its mass very close to the ideal pendulum and makes the instrument, as well as the results, more dependable and stable over the long-term (Fig. 2 and 3).



Fig. 2: Low vibration carbon pendulum rod

The ratio of pendulum to frame mass is extremely high, (>115) and enables it to measure 80 % of consumed energy with high accuracy according to ISO 13802.

A unique feature of the HIT Pendulum Impact Testers is the dovetail base plate guide which secures the Charpy, Izod, and tensile impact specimen vises over the entire depth of the support. Whilst enabling the tester to be quickly setup for each type of test, it also guarantees a perfect connection between the support and the frame of the impact tester.

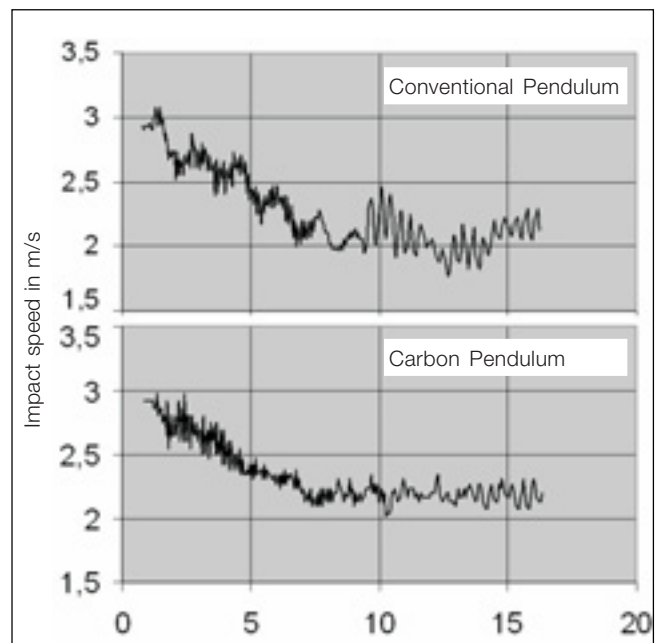


Fig. 3: Reduced inherent vibrations of the Carbon Pendulum

As a result of these brilliant features the HIT-Pendulum Impact Testers got the Materialica Design Award 2006.



Fig. 1: Zwick got the Materialica Design Award for the HIT5.5P

The heavy frame is made from cast iron to eliminate vibrations, and three heavy duty leveling feet ensure that the tester remains perfectly leveled.



Fig. 2: Charpy vise showing large slideway area and clamping wedge

An optional table, especially designed for the HIT Pendulum Impact Tester enables the optimum low vibration mounting conditions. Dependable test results can be then achieved independently of the local conditions. Large-area leveling elements and positioning stops secure a firm foothold of the pendulum impact tester. With Izod tests, the specimen remains can fall directly from the support into a container, so that they can be disposed of efficiently.

Any table, which is stable in transverse directions, can be used.



Fig. 3: Instrument table for the HIT Pendulum Impact Testers

Pendulum identification and interchangeability

Just as a certified weight has its mass engraved, each Zwick pendulum carries its own data in its electronic identity tag (Fig. 4). This tag identifies the test standard, pendulum energy, and starting angle. This eliminates erroneous measurements. The precise design and construction ensures that the test results exceed the requirements of the international standards. This allows the interchanging of pendulums with the same max. impact energy from one HIT instrument to another.



Fig. 4: Electronic identity tag

Modern instrument electronics

The electronics contains all important functions: the calculation and display of the impact energy, the correction of windage, which conforms to Standard, and the control of the vertical position in the impact direction. The connection of a PC, except with the Stand-Alone version, is via an USB interface. There is also a serial interface for connection to already existing LIMS Systems.



Fig. 1: Clear, easily understandable operating panel

The HIT Pendulum Impact Testers include a self-identifying power supply and they can be connected worldwide.

Simple, intuitive operation, distinguishes the HIT instrument electronics: The individual steps are subdivided logically from the set-up to the definition of the test. The menu leads quickly from set-up to test mode. The set-up includes:

- Determination of friction and windage to Standard and input of local rate of acceleration due to gravity.
- Monitoring of the time of swing of the pendulum.

The test mode displays:

- The absorbed impact energy in Joule or in ft-lbf and % of the impact energy used.

The determination of the impact resistance requires specimen's dimensions, which can either be captured via digital measuring instruments and a PC offering an RS232-interface or, via manual inputs at the PC keyboard.

Ergonomics

Packed with outstanding ergonomic features, the HIT Pendulum Impact Testers offer significant advantages to testing laboratories. The machine controls are placed close together and at the same level helping to simplify operation and reduce operator fatigue.

Specimen vises can be replaced simply by loosening the fixing screws, removing the first vise, and inserting the next one. Its exact positioning is achieved via stops in the baseplate.

The pendulum is easily changed by means of a quick release mechanism eliminating the need for tools.



Fig. 2: Pendulum quick release for fast changing of pendulums

The optional safety protection system contains an integrated receptacle on the left side of the machine for catching most of the broken specimen remains, and can be emptied when the protection device is swivelled out.

The electronics has a simple and easy to use keyboard, with a large and clear display designed to reduce fatigue even when testing large batches. The operation and structured menu system enables the machine to be setup and operated quickly and easily.

Accessories

Operator protection

The HIT Pendulum Impact Testers can be equipped with modular protection devices (Fig. 1). Certain legal safety standards allow working without protection only up to a pendulum energy of 5.5 Joules. Above this value operator protection is required.

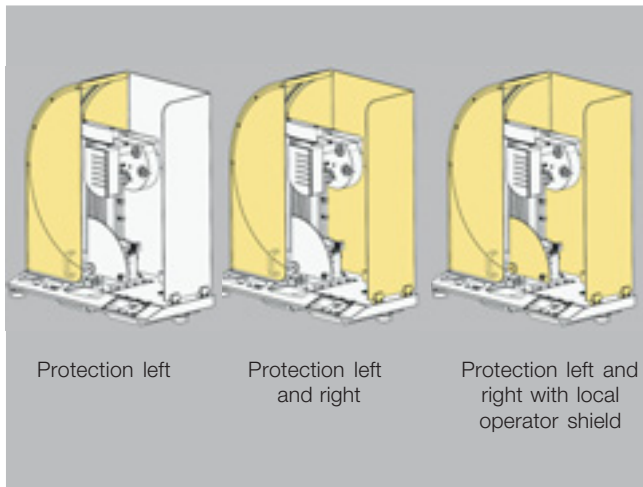


Fig. 1: Modular protection devices

The protection device on the left, (Fig. 1), can be used when protection is deemed necessary. The protection device contains an integrated receptacle for catching the specimen remains. If the protection device is swiveled out, the specimen remains can be easily and quickly removed.

If left and right protection screens are used, (Fig. 1), the instrument corresponds to CE-requirements for impact energies > 5.5 J and DIN 51233 (Materials Testing Machines – technical safety accords). A local operator shield is available for the Charpy support which protects the operator from flying debris (Fig. 2)

The instruments HIT25P and HIT50P are provided with a two hand operation for safety reasons.

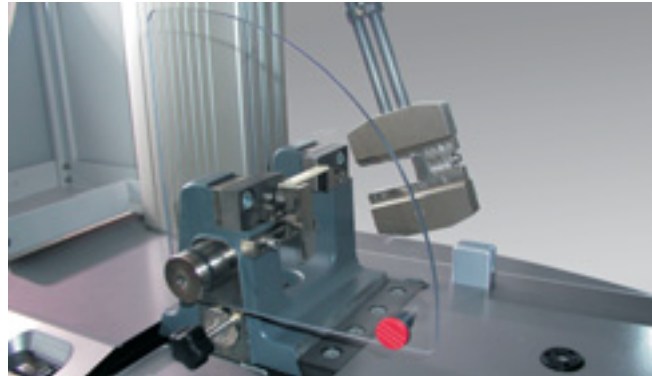


Fig. 2: Local operator shield at the Charpy vise

PC-Software *testXpert*® II

A choice of Master and Standard Test Programs are available for the HIT Pendulum Impact Testers. Master Test Programs have the most comprehensive range of options and flexibility to control test parameters and process results, and are perfectly suited to research and development needs. Standard Test Programs are focused on individual DIN, ISO or ASTM Standards, and are designed primarily for use in quality control laboratories.

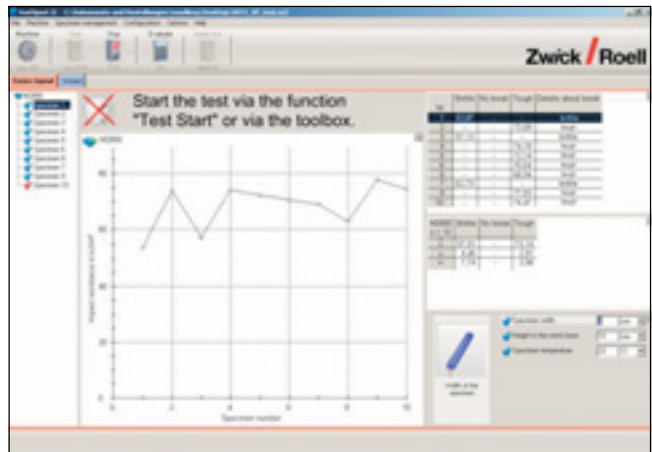


Fig. 3: *testXpert*® II Standard Test Program

Essential characteristics of Standard Test Programs:

- Acceptance of impact characteristics
- Test curve: impact characteristics over time and number of specimen
- Statistical evaluations, separated, according to the different fracture behaviour of the specimens

Essential characteristics of the Master Test Program:

- Acceptance of impact characteristics
- Test curve: impact characteristics over time, number of specimen and temperature
- Statistical evaluations
- Free set-up of report, export of data

Charpy-tools

The Charpy vises consist of a heavy cast iron body. Test specific accessories such as supports and abutments, can be selected according to the specimen to be tested (Fig. 1).

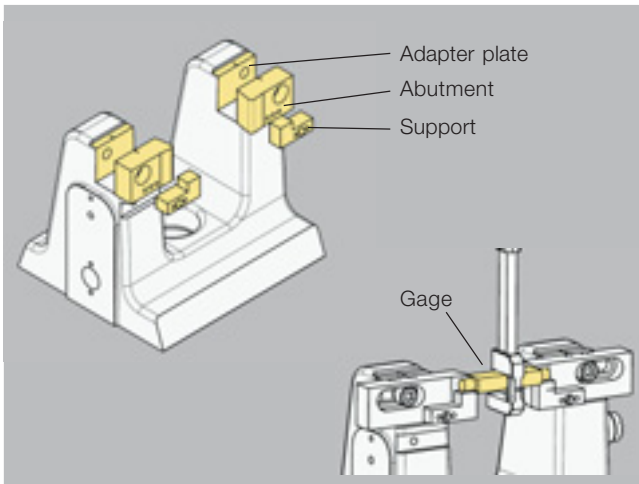


Fig. 1: Principle of the Charpy clamping device with accessories

As the precision of the abutments' roughness and radii affect the precision of the test results, these parts are completely manufactured on CNC-machines and 100 % quality controlled. Zwick does not offer single-piece abutments which may have low dimensional accuracy.



Fig. 2: Charpy vise for HIT25P and HIT50P with side alignment unit

Abutments or supports can be replaced independently, which is easy and cost-effective.

When mounting the abutments, a gage provided ensures their position in relation to the fin. Since abutments have higher wear than supports, they are designed so that they can be easily and inexpensively exchanged, independently of the supports or adapter plates.

Quick change adapter platens ensure proper adaptation to the specimen width in the impact direction. The specimen is aligned in the correct position by individual supports and adapter platens.



Fig. 3: Notch alignment unit at the Charpy vise

The quick change adapter plates are used to adapt the testing machine to different specimen widths, whilst the supports are precisely positioned using set pins and adapt to the specimen thickness.

An optional swivel protective shield can be used with the clamping device, and a positioning aid helps to position the specimen correctly using either the notch, or the front edge of the specimen.

The advantages:

- Quick changing of the clamping vise
- The abutments are precision-made by CNC machine and individually inspected for 100% accuracy

Izod-tools

There are two types of specimen vise which can be chosen: The manual device clamps the specimen with a fine threaded adjustment spindle which ensures that the optimum gripping force is applied whether on sensitive, soft or hard specimen.



Fig. 1: Izod clamping device, manual

If a high through-put is to be achieved, or if temperature conditioned specimen are to be tested, then the pneumatic clamping device would be the best. A further advantage is its high clamping force reproducibility, which leads to excellent test results on materials which are susceptible to clamping force variations.

Quick clamping via a switch on the clamping device itself, reduces the time between taking the specimen from the temperature unit and the performance of the test to a minimum.

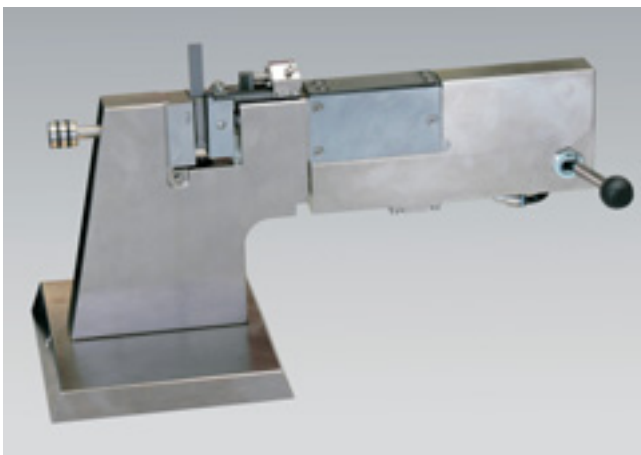


Fig. 2: High Izod-vise, pneumatic

Both clamping devices are equipped with a centering unit which ensures that the specimen notch is positioned at the correct height in the clamping device. The position of the sample relative to its width in the impact direction is performed by the quick-change inserts which have integrated lateral guides.

The advantages:

- Quick centering and gripping of the specimen
- Fine adjustment of specimen clamping force
- Quick testing with the pneumatic clamping device
- High reproducibility through constant clamping force

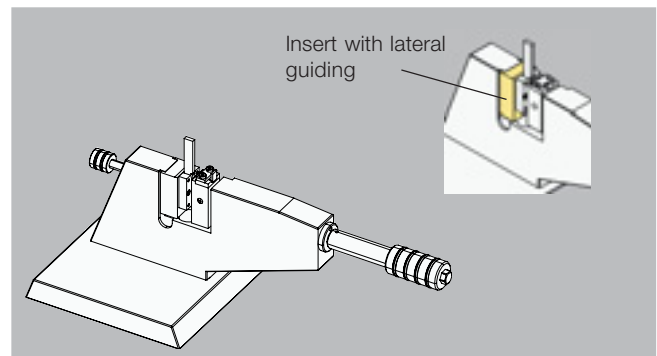


Fig. 3: Izod clamping device: adaption to specimens' dimensions

Tensile-impact tools

In order to accurately align the tensile impact specimen in the impact tester it is necessary to use a gage and template. This allows one end of the test specimen to be clamped in the yoke, and perfectly aligned at the same time.

For ISO and ASTM specimens corresponding templates can be selected.



Fig. 4: Clamping gage and templates for the tensile impact test

ISO 8256, Method A

For this test method one specimen shoulder is gripped in the yoke. The other end is secured in a vise attached to the impact tester. The pendulum strikes the yoke and hence the free end of the specimen in order to carry out the tensile impact test.

Yokes with masses of 15 up to 120 g are available.

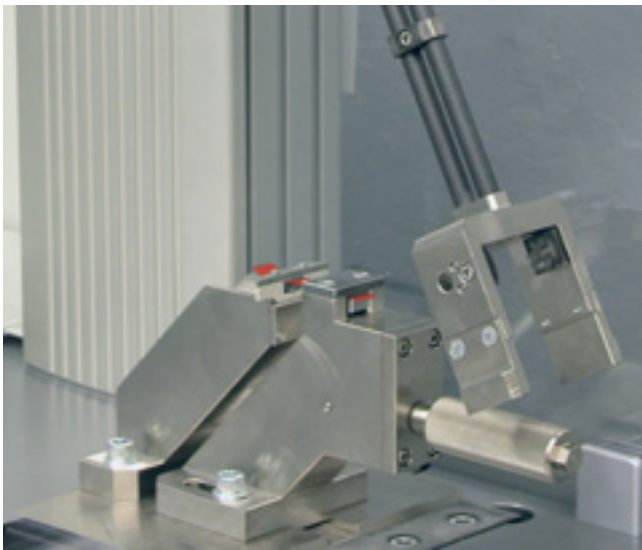


Fig. 1: Clamping device for tensile impact tests, Method A

ISO 8256 Method B and ASTM D 1822

With this method (specimen-in-head), one specimen end is gripped in the pendulum. The end of the specimen carries a yoke and hangs free. During the test, the free end with the yoke hits against the vise.

The same vise can be used for both Standards. Yokes with masses of 15 g up to 120 g are also available.

The advantage:

- Rapid configuration changes between the three different test methods.
- Precise sample alignment and clamping

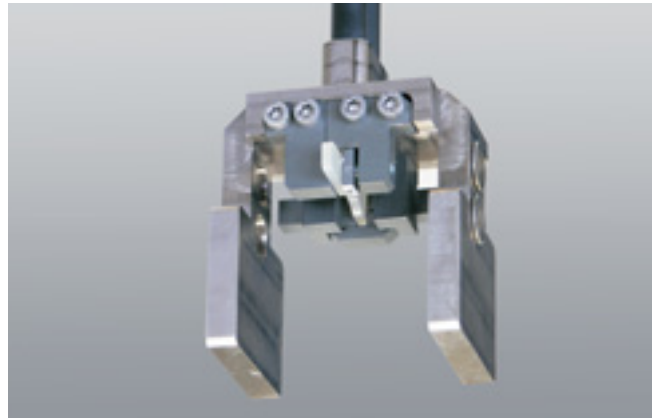


Fig. 2: Tensile impact specimen in pendulum - ASTM D 1822

Dynstat vise

The HIT Pendulum Impact Testers can also be equipped for Dynstat tests to DIN 51230. A Dynstat vise and many pendulums cover the Dynstat applications areas.



Fig. 3: Dynstat vise

3. Instrument Specification

The following points should be checked before a Pendulum Impact Tester is specified in detail:

- To be used with or without a PC
- Standards to be used
- Test methods and specimen to be used

The specification assistance on the next pages should help you to configure your instrument to meet your testing requirements. Naturally, we will be happy to assist you if you have questions.

For a quick orientation we marked the • item numbers with a red dot.

Selection of the basic unit

	PC-Model	Stand-Alone-Model
	To be used with PC	To be used without PC
Max. impact energy	5.5 J (4,06 ft lbf)	5.5 J (4,06 ft lbf)
Interfaces	RS232, USB upstream	none
Height x Width x Depth (w/o shield)	920 x 870 x 500 mm	920 x 870 x 500 mm
Weight without accessories	approx. 137 kg	approx. 137 kg
Line voltage	100 to 240 V, 50/60 Hz, 70 W	100 to 240 V, 50/60 Hz, 70 W
Test results, numeric	Impact work [%], Impact work abs. Impact strength	Impact work [%], Impact work abs., Impact strength
Units	SI, metric, imperial	J, ft lbf, %
Control functions	Friction correction Vertical position of pendulum Time of swing Display of instrument's data	Friction correction Vertical position of pendulum Time of swing Display of instrument's data
Item number	• 325650	• 325648

Pendulum release units for various standards





Two cable release units are available. The cable release unit is suitable for general purpose testing, and the pneumatic version is recommended for high specimen throughput.

In order to achieve the different impact speeds for ISO and ASTM tests, 2 starting angle mechanisms are available. They release the pendulum at the corresponding starting angle. To run tests according to both groups of standards, please specify both item numbers.

Pneumatic release unit	Cable release unit	Starting angle according to DIN/ISO-Standards	Starting angle according to ISO/ASTM-Standards
• 325700	• 325702	DIN 53435, ISO 179, ISO 8256 • 325924	ISO 180, ASTM D6110, ASTM D256, ASTM D4812, ASTM D1822 • 325926

HIT5.5P – Installation, operator protection, pendulum brake

These items are optional.

			
Instrument table	Protection left	Protection left and right	Pendulum brake
Low vibration mounting table with specimen container, 1200 (47.3") x 710 (28"), weight: 115 kg • 325706	Swivable with specimen remains container, not required for energies ≤ 5.5 J • 325816	Swivable left with remains container, fixed to the right. Operating area freely accessible CE- and DIN 51233-conform • 325818	Specimen disc brake, manually operated • 325704

HIT5.5P - PC-Software *testXpert*® II

testXpert® II comprises Master and Standard Test Programs for the optional use with the PC-Model.

testXpert® II

testXpert® II Test Programs

Master Test Program for Pendulum Impact Tests: To connect Zwick Roell Pendulum impact testers with the functionalities dependent on the configuration of the pendulum impact tester	•377008
Standard Test Programs:	
to DIN 50115, pendulum impact test on metal	•377090
to DIN 53435 (Dynstat) pendulum impact tests on plastics	•377032
to ISO 179-1 (Charpy), ISO 180 (Izod), ISO 8256 (tensile impact) Pendulum impact test on plastics	•377034
to ISO 179-2 06/2000, determination of Charpy impact properties on plastics, instrumented impact test	•377222
to ASTM D 6110 (Charpy), ASTM D 256, ASTM D 4812 (Izod), ASTM D 1822	•377036

HIT5.5P – Tests to Charpy: pendulums, pendulum-set

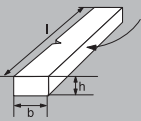
ISO 179 recommends using a pendulum in a narrowly limited range. The consequence is that pendulums must be changed quite often.

In order to meet this demand, the HIT-Pendulum Impact Testers have a pendulum quick-change unit. The changing of a pendulum is performed within seconds and, thanks to electronic pendulum identification, without any further inputs.

Important: With the HIT5.5P it is not necessary to fix or remove additional pendulum masses to change the pendulum energy.

The combination of pendulum identification and the quick-change unit, ensure that errors in pendulum energy due to incorrect use of supplemental masses or the loss of associated fixing screws are eliminated. The HIT5.5P is extremely reliable and easy to use.

Pendulums can be purchased individually or in sets:



Standard	Impact energy	Pendulum
ISO 179-1	0.5 J	•325738
	1 J	•325740
	2 J	•325742
	4 J	•325744
	5 J	•325746
ASTM D6110	0.5 J (0.37 ft lbf)	•325762
	1 J (0.74 ft lbf)	•325764
	2.7 J (2 ft lbf)	•325766
	5.4 J (4 ft lbf)	•325768
Pendulum sets		
ISO 179-1	4 J and 5 J	•325748
ASTM D6110	2.7 J and 5.4 J (2 ft lbf and 4 ft lbf)	•325770

HIT5.5P – Tests to Charpy: clamping vise and accessories

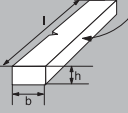
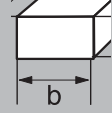

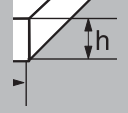



You can optionally purchase a local operator shield in combination with the Charpy clamping device. Choose side supports and abutments additionally to the specimen.

The notch alignment unit is required to align the specimen notch with the centre of impact. If the distance from the edge of the notch to one end of the specimen is specified in the test Standard then the side alignment unit should be used for centering the specimen. The attached stop is swivable.

			
Charpy vise •325708	Local operator shield •325710	Notch alignment unit •325712	Side alignment unit •325714

HIT5.5P – Tests to Charpy: adapter plates, supports and abutments

'Size b' in the table means the specimen's dimension in direction of impact, 'size h' is the dimension in direction of the pendulum's center of rotation.

						
Standard	Size b	Adapter plate	Size h	Support	Abutment	Span
ISO 179-1	10 mm	•325720	4 mm	•325730	•325716	62 mm
	4 mm	•325726	10 mm	•325734	•325716	62 mm
	15 mm	•325722	3 mm	•325728	•325718	22...70 mm
	10 mm	•325720	3 mm	•325728	•325718	22...70 mm
	3 mm	•325850	15 mm	•325736	•325718	22...70 mm
	3 mm	•325850	10 mm	•325734	•325718	22...70 mm
ASTM D 6110	12.7 mm (1/2")	•325752	3.17 mm (1/8")	•325754	•325750	101.6 mm (4")
	12.7 mm (1/2")	•325752	6.35 mm (1/4")	•325756	•325750	101.6 mm (4")
	12.7 mm (1/2")	•325752	12.7 mm (1/2")	•325758	•325750	101.6 mm (4")
DIN 50115	4 mm	•325726	3 mm	•325728	•325718	22...70 mm

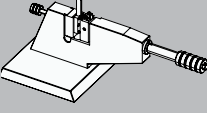
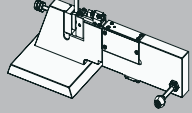
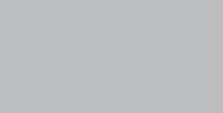
HIT5.5P – Tests to Izod: vises

The clamping force of the Izod vise may directly influence the test results, and two options are available for specimen clamping:

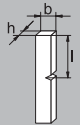
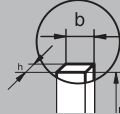
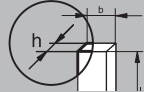


specimen without friction losses, and a pneumatic vise where the clamping force can be regulated and which is very comfortable to use. The pneumatic-switch for the closing of the jaws is integrated into the Izod-vise.

A manual vise using a precision threaded spindle which ensures that the torque is transferred directly to the


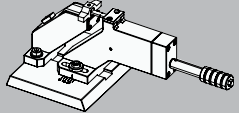
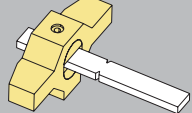


Inserts are required to fit the Izod-supports to the dimensions of the specimen.

		
Izod vise, manual •325774	Izod vise, pneumatic •325772	Notch alignment unit Contained in both

HIT5.5P – Tests according to Izod: inserts and pendulums


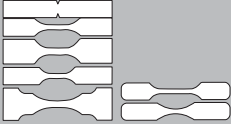


 Standard	 Specimen Size b	 Specimen, Size h	 Insert	 Impact energy, Pendulum
ISO 180	10 mm	4 mm	•325776	1 J (0.74 ft lbf) •325786
	10 mm	3 mm	•325778	2.75 J (2.03 ft lbf) •325788
ASTM D 256	12.7 mm (1/2")	3.17 mm (1/8")	•325780	5.5 J (4.06 ft lbf) •325790
ASTM D 4812	12.7 mm (1/2")	6.35 mm (1/4")	•325782	(pendulums can be used for all Standards)
	12.7 mm (1/2")	12.7 mm (1/2")	•325784	

HIT5.5P – Tensile impact testing: tensile impact supports, yokes and pendulums

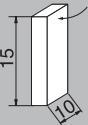


 Standard	 Tensile Imp. Supp.	 Yoke	 Mass	 Impact energy, Pendulum
ISO 8256	•325682	•325684	15 g	2 J •325688
Method A		•325686	30 g	4 J •325690
ISO 8256	•325692	•325848	15 g	2 J •325696
Method B				4 J •325698
ASTM D 1822	•325692	•325848	15 g	1.35 J (1 ft lbf) •325999
				2.7 J (2 ft lbf) •325804
				5.4 J (4.00 ft lbf) •325806

HIT5.5P – Tensile impact testing: clamping units for tests to ISO 8256 and ASTM D 1822

Simplifies a lasting clamping of the specimen in the yoke. For this clamping template and gage are required.

 Standard	 Specimen type	 Clamping template	 Clamping gage
ISO 8256	Type 1	•325672	•325798 (clamping gage can be used for all Standards)
Method A	Type 2	•325674	
	Type 3	•325676	
	Type 4	•325678	
ISO 8256	Type 2	•325674	
Method B	Type 4	•325678	
ASTM D 1822	Typ S / 9.53 mm (0.375")	•325800	
	Typ L / 9.53 mm (0.375")	•325802	
	Typ S / 12.71 mm (0.5")	•325950	
	Typ L / 12.71 mm (0.5")	•325952	

HIT5.5P – Dynstat Impact Flexure tests: vise and pendulum

 Standard	 Dynstat vise	 Impact energy, Pendulum
DIN 53435	•325808	0.2 J •325948
		0.5 J •325810
		1 J •325812
		2 J •325814

4. Instrument Specification of the HIT25P / HIT50P

Both impact testers already incorporate a two-hand safety pendulum release unit as well as starting angles for tests according to ISO and to ASTM.

Selection of the basic unit HIT25P

	PC-Model	Stand-Alone-Model
	To be used with PC	To be used without PC
Max. impact energy	25 J (18.45 ft lbf)	25 J (18.45 ft lbf)
Interfaces	RS232, USB device	none
Height x Width x Depth (with shield)	1170 x 1180 x 500 mm	1170 x 1180 x 500 mm
Weight without accessories	approx. 215 kg	approx. 215 kg
Line voltage	100 to 240 V, 50/60 Hz, 70 W	100 to 240 V, 50/60 Hz, 70 W
Test results, numeric	Impact work [%], Impact work absolute Impact strength	Impact work [%], Impact work absolute
Units	SI, metric, imperial	J, ft lbf, %
Control functions	Friction correction Vertical position of pendulum Time of swing Display of instrument's data	Friction correction Vertical position of pendulum Time of swing Display of instrument's data
Item number	•325975	•326048



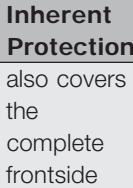
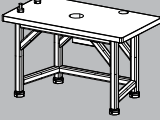
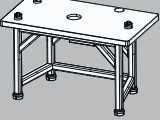
Selection of the basic unit HIT50P

For the HIT50P is a concrete basis for mounting on the floor or the instrument table 326104 necessary. Alternatively, a sufficiently stiff instrument table having a minimum weight of 260 kg may be used.

	PC-Model	Stand-Alone-Model
	To be used with PC	To be used without PC
Max. impact energy	50 J (36.90 ft lbf)	50 J (36.90 ft lbf)
Interfaces	RS232, USB device	none
Height x Width x Depth (with shield)	1170 x 1180 x 500 mm	1170 x 1180 x 500 mm
Weight without accessories with instrument table	approx. 475 kg	approx. 475 kg
Line voltage	100 to 240 V, 50/60 Hz, 70 W	100 to 240 V, 50/60 Hz, 70 W
Test results, numeric	Impact work [%], Impact work absolute Impact strength	Impact work [%], Impact work absolute
Units	SI, metric, imperial	J, ft lbf, %
Control functions	Friction correction Vertical position of pendulum Time of swing Display of instrument's data	Friction correction Vertical position of pendulum Time of swing Display of instrument's data
Item number	•326052	•326050

HIT25P / HIT50P – Installation, operator protection

These items are optional.

				
Protection left	Protection left and right	Inherent Protection	Instrument table	
Swivable with specimen remains container, not required for energies ≤ 5.5 J •326054	Swivable left with remains container, fixed to the right; Operating area freely accessible, CE- and DIN 51233-conform •326056	also covers the complete frontside •on request	Low vibration mounting table with specimen container To HIT25P Weight: 115 kg 1200 mm x 710 mm •326058	To HIT50P Weight: 260 kg 1280 mm x 710 mm •326104

HIT25P / HIT50P - PC-Software *testXpert*® II

testXpert® II Master and Standard Test Programs are optional for the use with the PC-Model.

testXpert® II

testXpert® II Test Programs

Master Test Program for Pendulum Impact Tests: To connect Zwick Roell Pendulum impact testers with the functionalities dependent on the configuration of the pendulum impact tester	•377008
Standard Test Programs:	
to DIN EN 10045, 01/1993, pendulum impact test (Charpy) on metal	•377154
to DIN 50115, pendulum impact test on metal	•377090
to DIN 53435 (Dynstat) pendulum impact tests on plastics	•377032
to ISO 179-1 (Charpy), ISO 180 (Izod), ISO 8256 (tensile impact) Pendulum impact test on plastics	•377034
to ISO 179-2 06/2000, determination of Charpy impact properties on plastics, instrumented test method	•377222
to ISO 14556, 05/2000, pendulum impact test (Charpy) on steel, instrumented test method	•377220
to ASTM D 6110 (Charpy), ASTM D 256, ASTM D 4812 (Izod), ASTM D 1822	•377036

HIT25P / HIT50P – Tests to Charpy: pendulums, pendulum-set



ISO 179 recommends using a pendulum in a narrowly limited range. The consequence is that pendulums must be changed quite often.

In order to meet this demand, the HIT-Pendulum Impact Testers have an electronic pendulum quick-change unit. The changing of a pendulum is performed within seconds and, thanks to pendulum identification, without any further inputs.

Important: With the HIT25P and HIT50P it is not necessary to fix or remove additional pendulum masses to change the pendulum energy.

The combination of pendulum identification and the quick-change unit, ensure that errors in pendulum energy due to incorrect use of supplemental masses or the loss of associated fixing screws are eliminated. The HIT5.5P is extremely reliable and easy to use.

Pendulums can be purchased individually or in sets:

 Standard	Impact energy	 Pendulum
ISO 179-1	0.5 J	•325738
	1 J	•325740
	2 J	•325742
	4 J	•325744
	5 J	•325746
	7.5 J	•326110
	15 J	•326112
	25 J	•326114
	50 J	•326116
ASTM D6110	0.5 J (0.37 ft lbf)	•325762
	1 J (0.74 ft lbf)	•325764
	2.7 J (2 ft lbf)	•325766
	5.4 J (4 ft lbf)	•325768
	10.8 J (8 ft lbf)	•326118
	21.6 J (16 ft lbf)	•326120
Pendulum sets		
ISO 179-1	4 J and 5 J	•325748
ASTM D6110	2.7 J and 5.4 J (2 ft lbf and 4 ft lbf)	•325770

HIT25P / HIT50P – Tests to Charpy: clamping vises and accessories

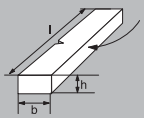
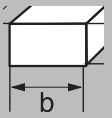

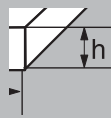
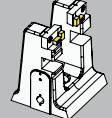
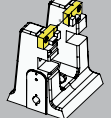
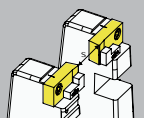
You can optionally purchase a local operator shield in combination with the Charpy clamping device. Choose supports and abutments additionally to the specimen. The notch alignment unit is required to align the specimen notch with the centre of impact. If the distance from the edge of the notch to one end of the

specimen is specified in the test Standard then the side alignment unit should be used for centering the specimen. The attached stop is swivable. The side alignment unit can be mounted at any position (upper or lower impact level, right or left side) on the vise. If frequent tests on different impact levels are performed, the 2-level-vise should be completely equipped with adapter plates, supports and abutments.

 Charpy vise	 Local operator shield	 Notch alignment unit	 Side alignment unit	
For all pendulums •326106	For pendulums > 5.5 J •325708	•325710	•326108	 Side alignment unit •325714

HIT25P / HIT50P – Tests to Charpy: adapter plates, supports and abutments

'Size b' in the table means the specimen's dimension in direction of impact, 'size h' is the dimension in direction of the pendulum's center of rotation. Every vise should be equipped with adapter plates, supports and abutments.

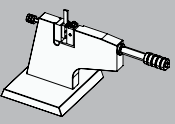
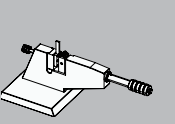
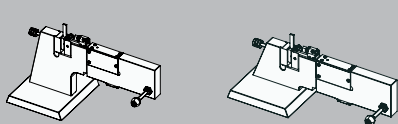
 Standard	 Size b	 Adapter plate	 Size h	 Support	 Abutment	 Span s
ISO 179-1	10 mm	•325720	4 mm	•325730	•325716	62 mm
	4 mm	•325726	10 mm	•325734	•325716	62 mm
	15 mm	•325722	3 mm	•325728	•325718	22...70 mm
	10 mm	•325720	3 mm	•325728	•325718	22...70 mm
	3 mm	•325850	15 mm	•325736	•325718	22...70 mm
	3 mm	•325850	10 mm	•325734	•325718	22...70 mm
ASTM D 6110	12.7 mm (1/2")	•325752	3.17 mm (1/8")	•325754	•325750	101.6 mm (4")
	12.7 mm (1/2")	•325752	6.35 mm (1/4")	•325756	•325750	101.6 mm (4")
	12.7 mm (1/2")	•325752	12.7 mm (1/2")	•325758	•325750	101.6 mm (4")
DIN 50115	4 mm	•325726	3 mm	•325728	•325718	22...70 mm

HIT25P / HIT50P – Tests to Izod: vises

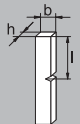
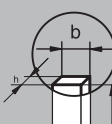
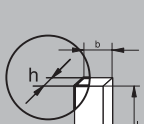


The clamping force of the Izod vise may directly influence the test results, and two options are available for specimen clamping:

A manual vise using a precision threaded spindle which ensures that the torque is transferred directly to the


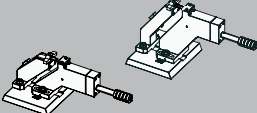
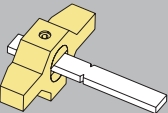
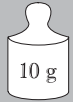

specimen without friction losses, and a pneumatic vise where the clamping force can be regulated and which is very comfortable to use. The pneumatic-switch for the closing of the jaws is integrated into the Izod-vise. Inserts are required to fit the Izod-supports to the dimensions of the specimen. Every vise should be equipped with inserts.

 Izod vise, manual	 Izod vise, pneumatic	 Notch alignment unit		
For pendulums <= 5.5 J	For pendulums > 5.5 J	For pendulums <= 5.5 J	For pendulums > 5.5 J	Contained in both
•326124	•325774	•326122	•325772	

HIT25P / HIT50P – Tests according to Izod: inserts and pendulums


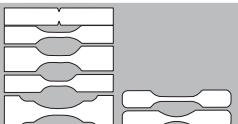


 Standard	 Specimen Size b	 Specimen, Size h	 Insert	 Impact energy, Pendulum
ISO 180	10 mm	4 mm	•325776	1 J (0.74 ft lbf) •325786
	10 mm	3 mm	•325778	2.75 J (2.03 ft lbf) •325788
ASTM D 256	12.7 mm (1/2")	3.17 mm (1/8")	•325780	5.5 J (4.06 ft lbf) •325790
ASTM D 4812	12.7 mm (1/2")	6.35 mm (1/4")	•325782	11 J (8.14 ft lbf) •326126
	12.7 mm (1/2")	12.7 mm (1/2")	•325784	22 J (16.28 ft lbf) •326128
(pendulums can be used for all Standards)				

HIT25P / HIT50P – Tensile impact testing: tensile impact supports, yokes and pendulums

 Standard	 Tensile Impact Support	 Yoke	 Mass	 Impact energy, pendulum	
ISO 8256 Method A	<ul style="list-style-type: none"> •326241 •326241 •325682 •325682 •325682 •325682 •325682 •325682 	<ul style="list-style-type: none"> •325684 •325684 •325686 •325686 •326140 •326140 •326245 •326245 	<ul style="list-style-type: none"> 15 g 15 g 30 g 30 g 60 g 60 g 120 g 120 g 	<ul style="list-style-type: none"> 2 J 4 J 7.5 J 15 J 25 J 50 J 25 J 50 J 	<ul style="list-style-type: none"> •325688 •325690 •326132 •326134 •326136 •326138 •326136 •326138
ISO 8256 Method B	<ul style="list-style-type: none"> •326130 •326130 •325692 •325692 •325692 •325692 	<ul style="list-style-type: none"> •325848 •325848 •326247 •326150 •326150 •326150 	<ul style="list-style-type: none"> 15 g 15 g 30 g 120 g 120 g 120 g 	<ul style="list-style-type: none"> 2 J 4 J 7.5 J 15 J 25 J 50 J 	<ul style="list-style-type: none"> •325696 •325698 •on request •on request •on request •on request
ASTM D 1822	<ul style="list-style-type: none"> •326130 •326130 •326130 •326130 •326130 	<ul style="list-style-type: none"> •325848 •325848 •325848 •326278 •326278 	<ul style="list-style-type: none"> 15 g (0.033 lb) 15 g (0.033 lb) 15 g (0.033 lb) 60 g (0.132 lb) 60 g (0.132 lb) 	<ul style="list-style-type: none"> 1.35 J (1 ft lb) 2.7 J (2 ft lb) 5.4 J (4 ft lb) 10.8 J (8 ft lb) 21.6 J (16 ft lb) 	<ul style="list-style-type: none"> •325999 •325804 •325806 •326152 •326154

HIT25P / HIT50P – Tensile impact testing: clamping units for tests to ISO 8256 and ASTM D 1822

Simplifies a rectangular clamping of the specimen in the yoke. For this clamping template and gage are required.

 Standard	 Specimen type	 Clamping template	 Clamping gage
ISO 8256 Method A	<ul style="list-style-type: none"> Type 1 Type 2 Type 3 Type 4 	<ul style="list-style-type: none"> •325672 •325674 •325676 •325678 	<ul style="list-style-type: none"> •325798 (clamping gage can be used for all Standards)
ISO 8256 Method B	<ul style="list-style-type: none"> Type 2 Type 4 	<ul style="list-style-type: none"> •325674 •325678 	
ASTM D 1822	<ul style="list-style-type: none"> Typ S / 9.53 mm (0.375") Typ L / 9.53 mm (0.375") Typ S / 12.71 mm (0.5") Typ L / 12.71 mm (0.5") 	<ul style="list-style-type: none"> •325800 •325802 •325950 •325952 	

HIT25P / HIT50P – Dynstat Impact Flexure tests: vise and pendulum

		
Standard	Dynstat vise	Impact energy, Pendulum
DIN 53435	•326156	0.2 J •325948
		0.5 J •325810
		1 J •325812
		2 J •325814
		4 J •325996

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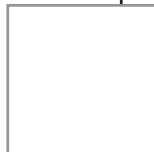
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