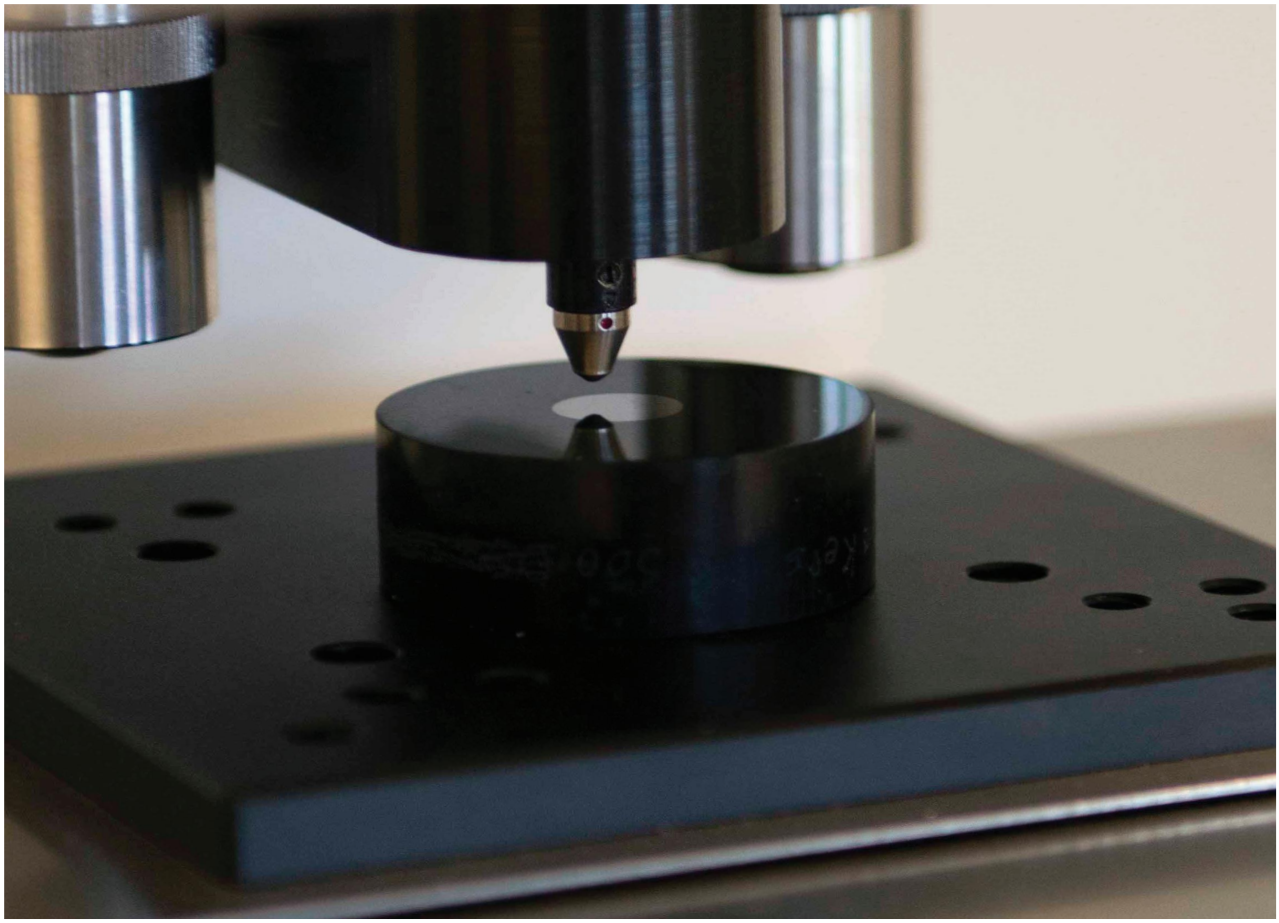
Tinius Olsen

The first name in materials testing

Evotech 2*** Series

Vickers/Knoop hardness testing system



Features:

- Automatic
- Load cell
- Closed loop
- Advanced force sensor

Test types:

- Vickers
- Micro Vickers
- Knoop

Vickers/Knoop systems of Evotech series

The Vickers and Knoop hardness tests are methods used to measure the hardness of materials by determining their resistance to indentation. On one hand Vickers test uses a diamond-shaped indenter with a square base. The indenter is pressed into the material's surface under a specific load, and the diagonals of the resulting indentation are measured while on other Knoop test uses a rhombic-based pyramid-shaped indenter to create an elongated, diamond-shaped indentation. The length of the long diagonal of the indentation is measured to determine the hardness value.
The Vickers test uses a diamond-shaped indenter with a square base. The indenter is pressed into the material's surface under a specific load, and the diagonals of the resulting indentation are measured.
The Knoop test uses a rhombic-based pyramid-shaped indenter to create an elongated, diamond-shaped indentation. The length of the long diagonal of the indentation is measured to determine the hardness value. Here's a breakdown of the key aspects:

- **Indenter:** Vickers uses a symmetrical pyramid-shaped indenter, while Knoop uses an elongated, rhombic-based pyramid-shaped indenter.
- **Measurement:** Diagonals of the indentation using a microscope.
- **Hardness Value:** Vickers Hardness (HV) and Knoop Hardness (HK) calculated from load and indentation size.
- **Applications:** Wide range of materials, metals, ceramics, polymers.
- **Advantages:** Versatile, applicable to various materials and scales (micro to macro), independent of indenter size for calculations.

Evotech 2030

Evotech 2040

Evotech 2050

Model Evotech 2030

The model Evotech 2030 Micro Vickers, Vickers, Knoop Hardness testing machines is a new generation of instrument, improving conventional hardness testing methods and focused on eliminating user influence on the test results. The unique force actuator system utilizes an electronically controlled closed loop system and advanced force sensor technology, with force feedback to achieve absolute accuracy, reliability and repeatability, on each of the forces used for a test. Besides this advanced electromechanical force application system, this model offers superior quality mechanical and optical components, used to complete the instrument.

Features and benefits

- Load cell, closed loop, force control
- Configured load range 1gf-62.5kgf (0.01-613N)*
- Meets or exceeds ISO, ASTM and JIS standards
- Smart touch workflow control
- Auto brightness and contrast
- Rapid up/down control
- Electronic eyepiece, automatic hardness display
- Electronic Z-axis handwheel, dynamic displacement
- Anti-collision system for objectives and indenters
- High power LED vertical illuminator with filter position
- Up to 170mm specimen height accommodation

* Configurations - as per table below

	Evotech 2030 force configuration options	
Force range	Force range fixed 5gf - 2kgf (can not be extended)	EV-FRE-0001
	Force range 10gf - 2kgf	EV-FRE-0002
	Force range 10gf - 10kgf	EV-FRE-0003
	Force range 10gf - 31.25kgf	EV-FRE-0004
	Force range 10gf - 62.5kgf	EV-FRE-0005
	Force range 200gf - 62.5kgf	EV-FRE-0006
Force range extension	Force range extension 1gf - 10gf	EV-FRE-0007
	Force range extension 10gf - 200gf	EV-FRE-0008
	Force range extension 2kgf - 10kgf	EV-FRE-0009
	Force range extension 10kgf - 31.25kgf	EV-FRE-0010
	Force range extension 31.25kgf - 62.5kgf	EV-FRE-0011
	Indenter actuator post (2nd indenter position) factory installed	

MODEL DETAILS

EV-040-2030	1gf-60kgf	Vickers
	1gf-5kgf	Knoop

STANDARD ACCESSORIES

- One indenter position/actuator installed
- One objective 10x, one objective 50x
- Four vibration dampers
- Power cable
- Four adjustable feet
- Certificate of calibration
- Installation and user manual

Advanced levels of automation

Software option 1

- High resolution camera
- 15” industrial touch screen
- mouse & keyboard
- System controller (windows OS)
- Auto indent measurement system

Software option 2

SOFTWARE OPTION 1 PLUS:

- Digital micrometer X-axis that transfers the position of the stage to Horizon

Software option 3

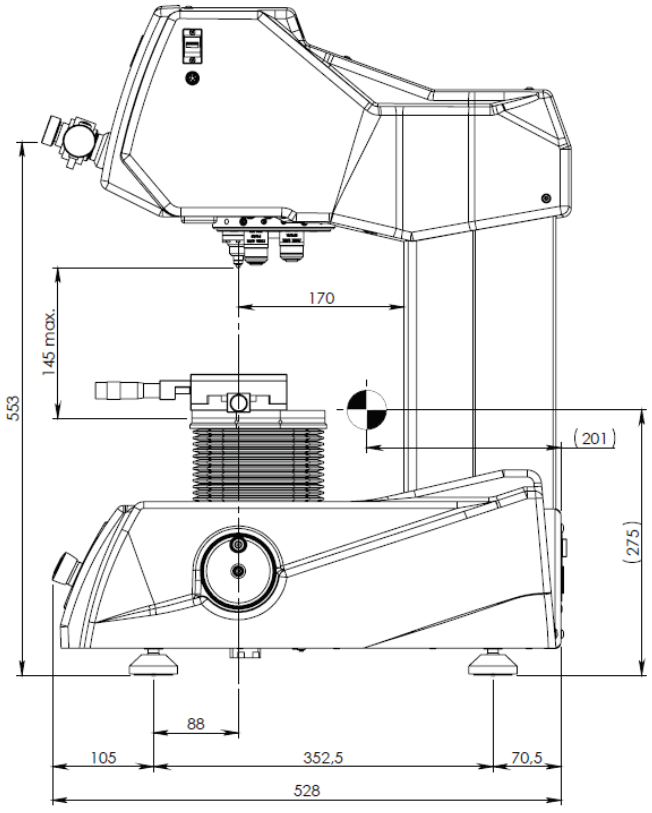
SOFTWARE OPTION 1 PLUS:

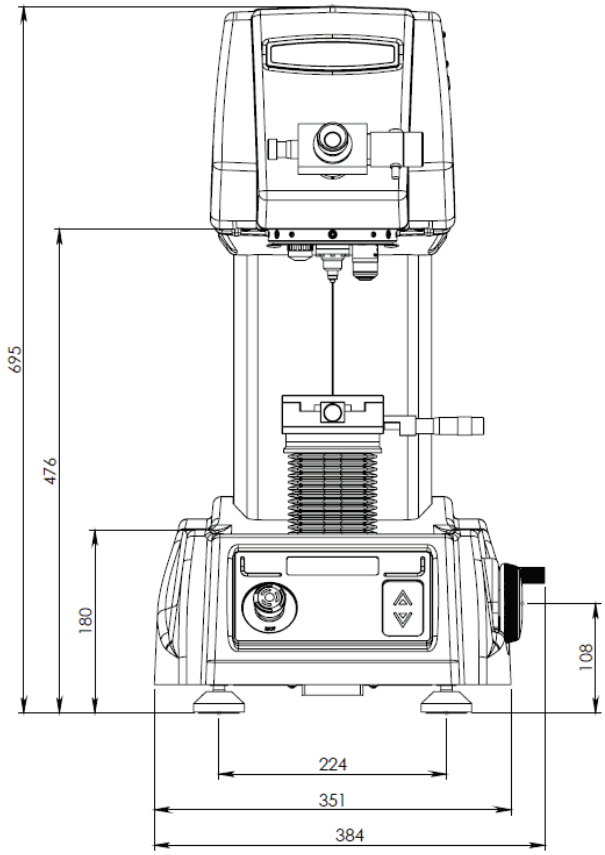
- Two digital micrometer X and Y-axis that transfers the position of the stage to Horizon

Specifications

EV 2030 specifications	
Item #	EV-040-2030
Hardness scales	(Micro-) Vickers, Knoop
Load application	Load cell, force feedback, closed loop system
Load range	5gf to 2kgf
Specimen height accommodation	Up to 170mm
Motorized turret	Six positions: Fitted with up to two indenters, four objectives
Optical system	See software options or digital microscope
Objectives	10x, 50x standard, 5x, 20x and 100x optional
Electronic system	High performance embedded electronics system running smart touch firmware
Test loads	[5, 6, 7, 8, 9, 10, 15, 20, 25, 50, 100, 200, 300, 400]gf, 1kgf, 2kgf
Vickers test range	HV0.005, 0.006, 0.007, 0.008, 0.009, 0.010, 0.015, 0.020, 0.025, 0.050, 0.1, 0.2, 0.3, 0.5, 1, 2
Knoop test range	HK0.001, 0.003, 0.005, 0.01, 0.015, 0.02, 0.025, 0.05, 0.1, 0.2, 0.3, 0.5, 1, 2
KiC fracture	KC/1, 3, 5, 10, 15, 20, 25, 50, 100, 200, 300, 400
Indenters	1 indenter position installed, 2nd position optional
Test cycles	Automatic turret STD
Standards	Complies to or exceeds ISO, ASTM, JIS (Nadcap)

EV 2030 specifications	
Test force tolerance	<0.5% for all forces
Display resolution	0.1HV/HK and 0.5HB
Hardness conversion	Rockwell, Superficial Rockwell, Vickers, Brinell, Knoop, Leeb & Tensile (ISO 18625/ASTM E140)
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Data storage capacity	Integrated memory system
Connectivity	USB ports, converter to RS232, 1x optional integrated CCD camera
Dwell time setting	Default 10 seconds, user defined 1-99 seconds (1 second increments)
Printer	Optional
Manual stage dimensions	Stage 100x100mm Travel 25x25mm Reading 0.01mm
Motorized stage dimension	See optional XY stage dimensions on next page
Machine dimensions	525 x 323 x 773mm (WxDxH)
Weight	75kg (165lb)
Operating temperature range	10-35°C (50-95°F) non-condensing
Power consumption	75W
Power supply	100-240V AC, 50Hz/60Hz, single phase
Humidity	10-90%, non-condensing
***Calibration of scales is required prior to use. Please specify desired scales at the time of ordering**	





Model Evotech 2040

The model Evotech 2040 Micro Vickers, Vickers, Knoop Hardness tester is a new generation of instrument, improving conventional hardness testing methods and focused on eliminating user influence on the test results. The unique force actuator system utilizes an electronically controlled closed loop system and advanced force sensor technology, with force feedback to achieve absolute accuracy, reliability and repeatability, on each of the forces used for a test. Besides this advanced electromechanical force application system, this model offers superior quality mechanical and optical components, used to complete the instrument.

Features and benefits

- Load cell, closed loop, force control
- Configured load range 200gf-62.5kgf (2-613N)*
- Meets or exceeds ISO, ASTM and JIS standards
- Electronic eyepiece, automatic hardness display
- Manual Z- axis handwheel
- Long working distance objectives
- ABS machine covers prevent damage from falling objects.

* Configurations - as per table below

	Evotech 2040 force configuration options	
Force range	Force range 200gf - 31.25kgf	EV-FRE-0013
	Force range fixed 200gf - 62.5kgf	EV-FRE-0014
Force range extension	Force range extension 31.25gf - 62.5gf	EV-FRE-0015
	Indenter actuator post (2nd indenter position) factory installed	

MODEL DETAILS

EV-045-2040	200gf-60kgf	Vickers
	200gf-5kgf	Knoop

STANDARD ACCESSORIES

- One indenter position/actuator installed
- Four objective positions
- Four vibration dampers
- Power cable
- Four adjustable feet
- Certificate of calibration
- Installation and user manual

Advanced levels of automation

Software option 1

- High resolution camera
- 15” industrial touch screen
- mouse & keyboard
- System controller (windows OS)
- Auto indent measurement system

Software option 2

SOFTWARE OPTION 1 PLUS:

- Digital micrometer X-axis that transfers the position of the stage to Horizon

Software option 3

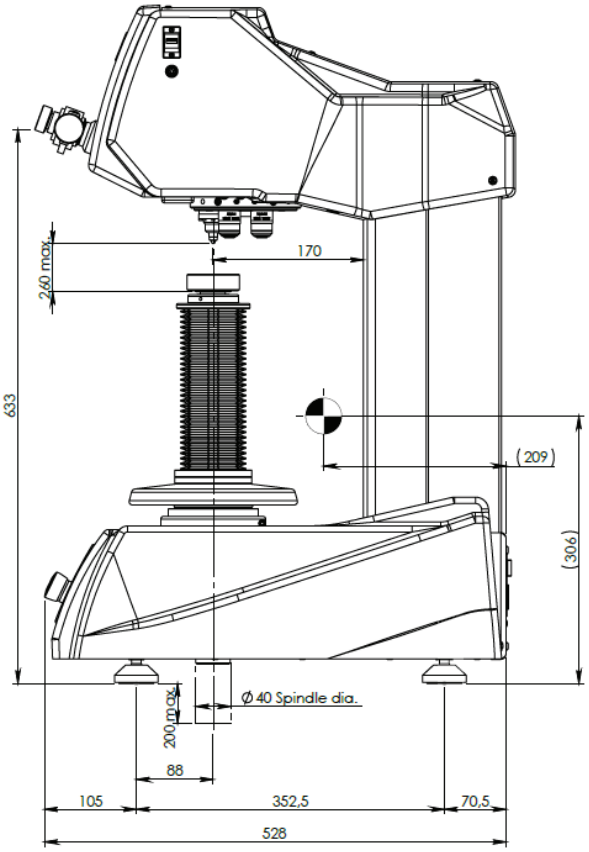
SOFTWARE OPTION 1 PLUS:

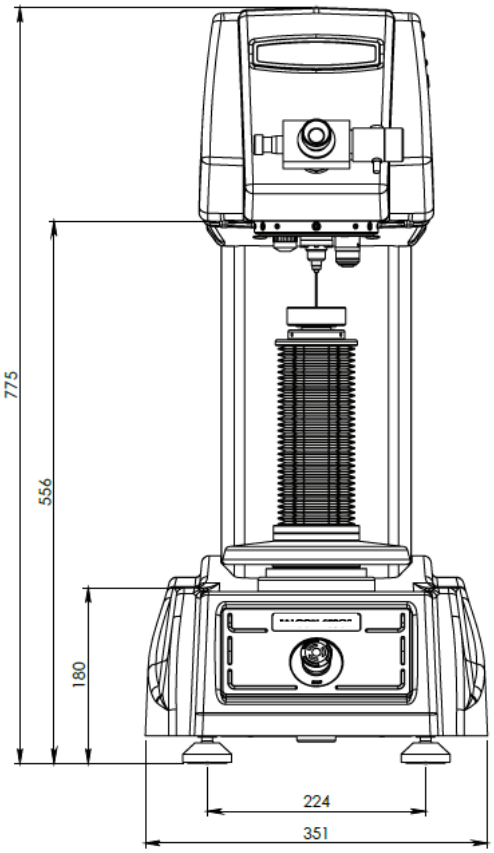
- Two digital micrometer X and Y-axis that transfers the position of the stage to Horizon

Specifications

EV 2040 specifications	
Item #	EV-045-2040
Hardness scales	(Micro-) Vickers, Knoop
Load application	Load cell, force feedback, closed loop system
Load range	200gf to 62.5kgf
Specimen height accommodation	Up to 170mm
Motorized turret	Six positions: Fitted with up to two indenters, four objectives
Optical system	See software options or digital microscope
Objectives	5x, 10x, 20x, 50x and 100x
Electronic system	High performance embedded electronics system running smart touch firmware
Test loads	[200, 300, 500]gf, [1, 2, 2.5, 3, 4, 5, 10, 20, 25, 30, 40, 50, 60]kgf
Vickers test range	HV0.2, 0.3, 0.5, 1, 2, 2.5, 3, 4, 5, 10, 20, 25, 30, 40, 50, 60
Knoop test range	HK0.2, 0.3, 0.5, 1, 2, 2.5, 3, 4, 5
KiC fracture	KC/1, 3, 5, 10, 15, 20, 25, 50, 100, 200, 300, 400
Indenters	1 indenter position installed, 2nd position optional
Test cycles	Automatic turret STD
Standards	Complies to or exceeds ISO, ASTM, JIS (Nadcap)

EV 2040 specifications	
Test force tolerance	<0.5% for all forces
Display resolution	0.1HV/HK and 0.5HB
Hardness conversion	Rockwell, Superficial Rockwell, Vickers, Brinell, Knoop, Leeb & Tensile (ISO 18625/ASTM E140)
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Data storage capacity	Integrated memory system
Connectivity	USB ports, converter to RS232, 1x optional integrated CCD camera
Dwell time setting	Default 10 seconds, user defined 1-99 seconds (1 second increments)
Printer	Optional
Manual stage dimensions	Stage 100x100mm Travel 25x25mm Reading 0.01mm
Motorized stage dimension	See optional XY stage dimensions on next page
Machine dimensions	528 x 351 x 775mm (WxDxH)
Weight	86kg (190lb)
Operating temperature range	10-35°C (50-95°F) non-condensing
Power consumption	75W
Power supply	100-240V AC, 50Hz/60Hz, single phase
Humidity	10-90%, non-condensing
***Calibration of scales is required prior to use. Please specify desired scales at the time of ordering**	





Model Evotech 2050

The model Evotech 2050 Micro-Vickers, Vickers Hardness testing machines are a new generation that use a unique, electronically controlled, closed loop system and advanced force sensor technology to achieve absolute accuracy, reliability and repeatability, on each of the forces used for a test. The innovative Horizon software allows file storing, test program setting and storing, image zoom, auto focus, limit settings, conversions to other hardness scales, system setup and (remote) control, and pattern testing (CHD/Nht/Rht) to ensure high reproducibility of test results and limit operator error and interpretatios.

Features and benefits

- Multi load cell, closed loop, force control
- Load range 0.1gf-62.5kgf (0.001-613N)*
- Meets or exceeds ISO, ASTM and JIS standards
- Advanced measurement options; single, serial measurements, 2 high definition camera systems
- 6 position turret, 2 indenter positions (optional), 4 LWD objective positions of which 2 installed
- 11 Megapixel, Full HD+, integrated TTL camera system
- Z-axis with ball bearing spindle (standard)
- Anti-collision system for objectives and indenters
- High power LED vertical illuminator with filter position
- Industrial 27" touchscreen, option for 27" or 2 x 24" screens or projector

* Configurations - as per table below

MODEL DETAILS

EV-050-2050	0.1gf-60kgf	Vickers
	1gf-5kgf	Knoop
	1kgf-62.5kgf	Brinell

STANDARD ACCESSORIES

- One indenter position/actuator installed
- One objective 10x, one objective 50x
- Four vibration dampers
- Power cable
- Four adjustable feet
- Certificate of calibration
- Installation and user manual

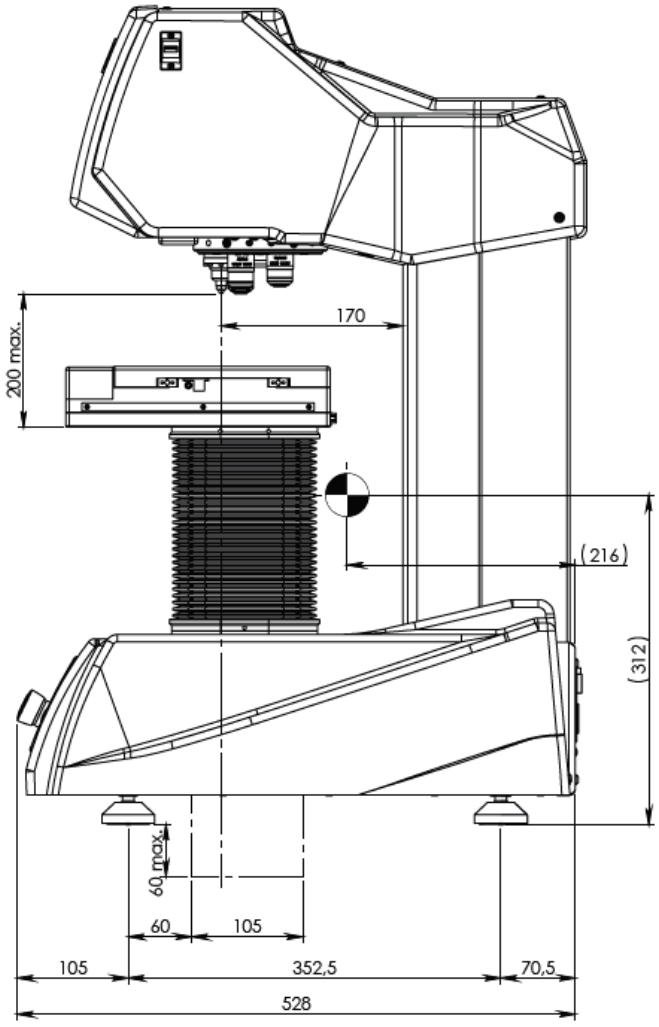
	Evotech 2050 force configuration options	
Force range	Force range fixed 5gf - 2kgf (can not be extended)	EV-FRE-0001
	Force range 10gf - 2kgf	EV-FRE-0002
	Force range 10gf - 10kgf	EV-FRE-0003
	Force range 10gf - 31.25kgf	EV-FRE-0004
	Force range 10gf - 62.5kgf	EV-FRE-0005
	Force range 200gf - 62.5kgf	EV-FRE-0006
Force range extension	Force range extension 0,1gf - 1gf, steps of 0.05gf	EV-FRE-0012
	Force range extension 1gf - 10gf	EV-FRE-0007
	Force range extension 10gf - 200gf	EV-FRE-0008
	Force range extension 2kgf - 10kgf	EV-FRE-0009
	Force range extension 10kgf - 31.25kgf	EV-FRE-0010
	Force range extension 31.25kgf - 62.5kgf	EV-FRE-0011
	Indenter actuator post (2nd indenter position) factory installed	

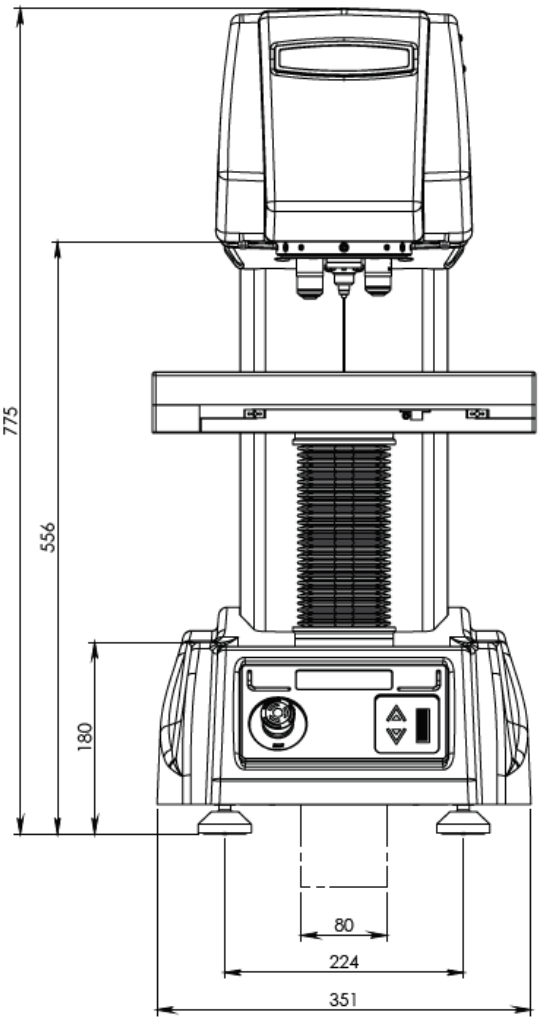
Specifications

EV 2050 Specifications	
Item #	EV-050-2050
Hardness scales	(Micro-) Vickers, Knoop
Load application	Load cell, force feedback, closed loop system
Load range	5gf-2kgf
Motorized turret	Six positions: two indenters, four objectives
Optical system	High definition, 11MP machine vision system
Objectives	2.5x, 5x, 10x, 20x, 50x, 100x
Overview camera (optional)	Optical zoom camera, field of view 50x37mm / 200x160mm
Electronic system	High performance embedded micro system controller, MS windows®, 15" full color industrial touchscreen, automatic and manual measurement
Test loads	5, 6, 7, 8, 9, 10, 15, 20, 25, 50, 100, 200, 300, 400gf, 1kgf, 2kgf
Vickers test range	HV0.005, 0.006, 0.007, 0.008, 0.009, 0.010, 0.015, 0.020, 0.025, 0.050, 0.1, 0.2, 0.3, 0.5, 1, 2
Knoop test range	HK0.01, 0.02, 0.025, 0.05, 0.1, 0.2, 0.3, 0.5, 1, 2
Indenters	1 indenter position installed, 2nd position optional
Test cycles	Fully automatic, automatic and manual
Standards	complies to or exceeds ISO, ASTM, JIS (Nadcap)
Test for accuracy	<1% for test force 100gf to 2kgf <1.5% for test force below 100gf

EV 2050 Specifications	
Display resolution	0.1HV/HK
Hardness conversion	Rockwell, Superficial Rockwell, Brinell, Leeb & Tensile
Statistics	Total test, max, min, average, range, standard deviation, all in real time after each test
Data storage capacity	Dual SSD 80GB, RAID system
Connectivity	Two USB ports, RJ45 ethernet, LAN, W-LAN, RS232, Bluetooth, five-axis CNC and motorized XY stage connector
Dwell time setting	Default 10 seconds, user defined
Printer	A4, A3 full color laser printer(optional)
Manual stage dimensions	Stage 100x100mm Travel 25x25mm Reading 0.01mm
Motorized stage dimension	see optional XY stage dimensions on next page
Machine dimensions	525 x 323 x 773mm (WxDxH)
Weight	75kg (165lb)
Operating temp. range	10-35°C (50-95°F) non-condensing
Power consumption	100W
Power supply	100-240V AC, 50Hz/60Hz, single phase
Humidity	10-90%, non-condensing

***Calibration of scales is required prior to use. Please specify desired scales at the time of ordering**





Optional accessories

HV HK

The models of Evotech Micro-, Macro-Vickers hardness systems have optional accessories in support of different types of tests and/or materials.

Factory options		models
FH-053-0015	Additional indenter position - factory installed	EV2050, EV2040 EV2030

Overview Camera		models
FH-006-1020	Overview camera + software functionality, FoV 35x50mm up to 200x180mm, includes overview lights	EV2050

Software options		models
FH-500-0006	Software opt 1 automatic measurement, file storage, 5Mpx camera, 15" industrial monitor, windows OS	EV2030, EV2040
FH-500-0007	Software opt 2 - auto measure, 1 digital micrometer on XY stage	EV2030, EV2040
FH-500-0008	Software opt 3 - auto measure, 2 digital micrometers on XY stage	EV2030, EV2040
FH-050-0222	Analogue microscope 15x mag - micro	EV2030, EV2040
FH-050-0237	Digital microscope 15x base mag	EV2030, EV2040

Note : A software option or microscope is a required selection

Software modules		models
FH-500-0012	2D/3D hardness scanning (mapping, includes automatic contour scanning)	EV2050
FH-500-0014[2,3]	Pattern testing software module	EV2050
FH-500-0015[2]	CHD, Nht, Rht Configurator and graphic interface	EV2050
FH-500-0016	Specialized ammo (casting/shells) test setup and report configuration	EV2050
FH-500-0018[2]	KC fracture measurement by Vickers diamond indentation	EV2050
FH-500-0020	ISO 9015 weld pattern configurator (automatic) requires : overview camera	EV2050
FH-500-0021[1]	Adv coordinate manual pattern configurator, CHD, SHD, NHD W/ edge detection	EV2050
FH-500-0022	Image stitching full stage overview & sample overview-high resolution Requires a motorized stage.	EV2050
FH-500-0023[2]	Automatic contour scanning	EV2050
FH-500-0024[1]	Drawing and measuring (distance & angles) application	EV2050
FH-500-0025[2]	Automatic edge detection	EV2050
FH-500-0027[2]	ISO 898-1 screw thread measurement of (de)-carbonized part. (requires FH-500-0023)	EV2050
FH-500-0028[2]	ISO-2702 tap screw thread measurement	EV2050
FH-500-0029[1]	CHD, SHD, NHD config. & graphic interface analogue/digital micrometer stage	EV2050
FH-500-0030[1]	Q-DAS certified connectivity protocol	EV2050

Note: Additional accessories may be required for software modules [1] require any software option [2] require FH-500-0009 [3] Included in software option FH-500-0009

Indenters		models
FH-200-1000	Micro Vickers Indenter Ø3mm acc ISO 6507/2 & ASTM-E92 A3. (7mm)	EV2030, EV2040, EV2050
FH-200-1001	Micro Knoop Indenter Ø3mm acc. to ISO 4545/2 & ASTM-E92 A3 (7mm)	EV2030, EV2040, EV2050

Connectivity		models
FH-500-0011	EV-series connection w/ external Horizon (add. requirements per EV-model)	EV2030, EV2040, EV2050

Cover		models
FH-052-0005	Tester cover 35x55x77cm	EV2030, EV2040, EV2050

Objectives		models
FH-050-0211	2.5x objective	EV2050
FH-050-0212	5x objective	EV2030, EV2040, EV2050
FH-050-0213	10x objective (standard)	EV2030, EV2040, EV2050
FH-050-0214	20x objective	EV2030, EV2040, EV2050
FH-050-0216	50x objective (standard)	EV2030, EV2040, EV2050
FH-050-0219	100x objective	EV2030, EV2040, EV2050
FH-050-0356	CrystalTM clear LED ring light, multi user for 2.5x objectives	EV2050
FH-050-0357	CrystalTM clear LED ring light, multi user for 5x objectives	EV2050

Stage/Acc		models
FH-006-1001	Digital micrometer 25mm resolution 0.001, fit - manual XY stage	EV2050
FH-049-0001	Motorized 307x208mm XY CNC stage, max 400kg, displacement 170x120mm	EV2050
FH-049-0002	Motorized 357x208mm XY CNC stage, max 400kg, displacement 220x120mm	EV2050
FH-049-0012[3]	Motorized 237x188mm XY CNC stage, max 100kg, displacement 100x100mm	EV2050
FH-049-0013	Motorized 257x188mm XY CNC stage, max 400kg, displacement 120x120mm	EV2050
FH-049-0022	Mounting plate X/Y stage	EV2050
FH-049-0026	Fixing bushing for CNC stage	EV2030
FH-050-0011	Digital micrometer 25mm resolution 0.001, fit - manual XY stage	EV2030
FH-050-0036	Manual XY stage w/ analogue micrometers, 180x160mm 300kg (Req FH-049-0022)	EV2050
FH-050-0066	XY stage with mechanical micrometers cap 100kg	EV2030, EV2050
FH-050-0114	Cable set for connecting CNC stage to embedded driver	EV2030, EV2050
FH-050-0289	Vibration isolation table	EV2030, EV2050
FH-050-0312	Fixing plate for XY stage	EV2030
FH-050-0317	Fixing bushing XY stage	EV2030
FH-050-0331	XY stage with mechanical micrometers cap 60kg	EV2030

Fixtures/Vice		models
FH-050-0067	Axle chuck (cap 62.5kgf)	EV2030, EV2040, EV2050
FH-050-0068	Small parts vice (cap 62.5kgf) W 55mm open 50mm max	EV2030, EV2040, EV2050
FH-050-0073	Universal clamp & leveling device (cap 62.5kgf)	EV2030, EV2040, EV2050
FH-050-0075	Wire testing fixture	EV2030, EV2040, EV2050
FH-050-0076	Thin metal clamp - micro testing	EV2030, EV2040, EV2050
FH-050-0112	Fixture for Jominy testing. 1 quench end test sample with quick release	EV2030, EV2040, EV2050
FH-050-0113	Fixture for Jominy testing. 3 quench end test sample with quick release	EV2030, EV2040, EV2050
FH-050-0340	Polished precision vice with lock, opening width 25mm, opens 20mm	EV2030, EV2040, EV2050
FH-050-0341	Polished precision vice with lock, opening width 36mm, opens 42mm	EV2030, EV2040, EV2050

Optional accessories

Fixtures/Vice		models
FH-050-0342	Polished precision vice with lock, opening width 48mm, opens 75mm	EV2030, EV2040, EV2050
FH-050-0343	Polished precision vice with lock, opening width 75mm, opens 100mm	EV2030, EV2040, EV2050
FH-050-0345	V-Grove small clamp ø0.8-5mm	EV2030, EV2040, EV2050

Anvil/Acc		models
FH-006-1008	Small V-Anvil 3-20mm requires base plate(requires manual/ automated XY stage)	EV2030, EV2040, EV2050
FH-006-1009	Large V-Anvil 20-75mm requires base plate(requires manual/automated XY stage)	EV2030, EV2040, EV2050
FH-050-0029	Test table 100x100mm, V-Grove 20mm wide, 10mm deep	EV2030, EV2040
FH-050-0040	V-Anvil ø40mm for 6-60mm	EV2030, EV2040
FH-050-0117	Testing table flat 80mm	EV2030, EV2040
FH-050-0266	60mm flat anvil	EV2030, EV2040
FH-050-0267	Base plate for V-Anvil fit: FH-006-1008/1009	EV2030, EV2040, EV2050
FH-050-0324	Cylindrical V-Anvil 6-80mm	EV2030, EV2040
FH-050-0325	Cylindrical V-Anvil 50-200mm	EV2030, EV2040
FH-050-0326	V-Anvil ø63mm for 10-100mm	EV2030, EV2040
FH-050-0353	V block with bracket 40x40x50mm (LxBxH)	EV2030, EV2040, EV2050
FH-050-0354	Steel, cross type, (X) V-block 60x120x100mm 8-90mm pair	EV2030, EV2040, EV2050

Tables/Cabinets		models
FH-095-1008	Cabinet/table for bench machines 710 x 750 x 800 mm (grey/black top)	EV2030, EV2040, EV2050
FH-095-1009	Cabinet/table for bench machines 1500 x 750 x 800 mm (grey/black top)	EV2030, EV2040, EV2050

Sample holder		models
FH-050-0268	Encased sample holder, 1 position (ring selection required) 50mm/2”	EV2030, EV2040, EV2050
FH-050-0269	Encased sample holder, 4 position (ring selection required)	EV2050
FH-050-0270	Encased sample holder, 6 position (ring selection required)	EV2050
FH-050-0271	Encased sample holder ring, 25mm (Ea)	EV2030, EV2050
FH-050-0272	Encased sample holder ring, 30mm (Ea)	EV2030, EV2050
FH-050-0273	Encased sample holder ring, 40mm (Ea)	EV2030, EV2050
FH-050-0307	Encased sample holder ring, 1 inch (Ea)	EV2030, EV2050
FH-050-0308	Encased sample holder ring, 1 ¼ inch (Ea)	EV2030, EV2050
FH-050-0309	Encased sample holder ring, 1 ½ inch (Ea)	EV2030, EV2050

Calibration options		models
FH-051-0000	Direct calibration; ISO 17025-A2LA compliant/per scale (factory)	EV2030, EV2040, EV2050
FH-051-0002	Additional scales calibration	EV2030, EV2040, EV2050
FH-051-0005	VICKERS direct and indirect verification/ calibration & certification in compliance with ISO & ASTM, NADCAP. Includes direct force and indirect verification report (block readings), GR & R report	EV2030, EV2040, EV2050
FH-051-0007	KNOOP direct and indirect verification/ calibration & certification in compliance with ISO & ASTM, NADCAP. Includes direct force and indirect verification report (block readings), GR & R report	EV2030, EV2040, EV2050

Tinius Olsen

www.tiniusolsen.com

● Horsham, PA, USA ● Redhill, Surrey, UK

● Noida, UP, India ● Shanghai, PR China