



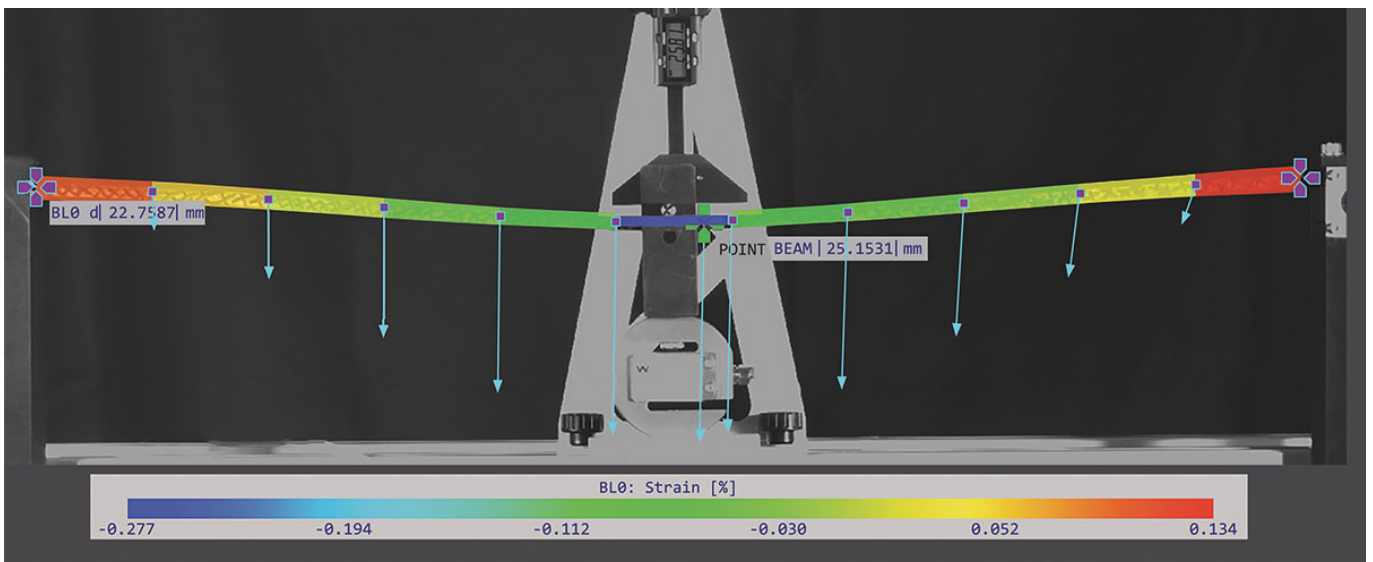
DEFLEX®

DEFLEX®-2D

An entry-level digital image correlation (DIC) system to teach students how to measure and visualise surface deformations, strains and displacements in materials and shapes.



DEFLEX®-2D



SCREENSHOT OF THE DEFLEX® SOFTWARE

KEY FEATURES

- Complete system including camera, stands and lighting
- Includes Deflex® software
- Includes calibration set
- Frame rate – 60 FPS
- System can be used on wide variety of TecQuipment products
- Meets requirements for ASTM E83, ISO 9513, and JIS B7741

KEY BENEFITS

- Non-contact method – no contact between the camera and the object/surface
- Visualises strain measurement and shape deformation
- Enhances student learning experience
- Fast and easy to set up
- Teaches students principles of digital image correlation

KEY SPECIFICATIONS

- Single low-noise camera unit with in-built LED light
- Resolution: 6.3 MPx
- FOV/resolution @ distance 239 mm: 190/0.5 µm
- For a wide range of measuring areas, 200–2000 mm
- Deflex® software
- One year of technical enhancements and customer support



DESCRIPTION

The DefleX®-2D edition offers a student-friendly solution for visualising optical deformation measurements on various object sizes. It is a compact and fully integrated system that offers students a digital blended learning experience as part of materials science, structural or general mechanical engineering courses. It is equipped with camera measurement and image processing software for analysing motions, displacements and strains.

Versatile in application, the TecQuipment DIC unit is suitable for uniaxial testing (ISO 6892), biaxial testing (ISO 16842) and shear testing, as well as three-point and four-point bending (ISO 178) and torsion testing, making it a comprehensive tool for material and structural analysis.

WHAT'S INCLUDED

The DefleX®-2D edition includes:

- All-in-one DIC unit with integrated LED light and camera (supplied with 12 mm lens)
- Power/USB connection cable
- 2 x calibration grids
- USB licence key
- USB device with installation files and comprehensive user guide
- DefleX® software
- Camera tripod
- Light mounting arm
- 2 x additional LED lights
- Light tripod
- Backdrop screen
- Sturdy storage box
- 1 x each: black permanent fine tip marker pen, black non-permanent fine tip marker pen, white fine tip paint pen
- Cable tie hook and loop
- One year of technical enhancements and customer support

STANDARD FEATURES

- Comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union Directives
- ISO 9001 certified manufacturer

RECOMMENDED ANCILLARIES

- DIC Educational Network Licence (DefleX®-Net)
- Additional lenses (see table on page 5 for details)
- Either: an annual or multi-year technical enhancement package up to 5 years (DefleX®-2D-TE1-TE5)



CAMERA TRIPOD



USB DEVICE



DIC UNIT



12 MM LENS



POWER/USB CONNECTION CABLE



CALIBRATION GRIDS



BACKDROP SCREEN
(EXAMPLE IMAGE)



LIGHT MOUNTING ARM
(EXAMPLE IMAGE)



LED LIGHTS
(EXAMPLE IMAGE)



STORAGE
BOX

RECOMMENDED EXPERIMENTS/PRODUCTS

NEXT GENERATION STRUCTURES:

- Deflection of Beams and Cantilevers (STS4)*
- Two-Pinned Arch (STS10)*
- Fixed Arch (STS11)*
- Curved Bars and Davits (STS14)*
- Plastic Bending of Beams (STS15)*
- Plastic Bending of Portals (STS16)*
- Frame Deflections and Reactions (STS18)
- Simple Suspension Bridge (STS19)

MATERIALS TESTING AND PROPERTIES:

- Universal Testing Machine (SM1000)
- Benchtop Tensile Testing Machine (SM1002)*
- Creep Machine (SM1006)*
- Materials Laboratory with Data Capture (MF40 MKII)*
- Beam Apparatus (SM1004)
- Hooke's Law and Spring Rate (SM110)
- Stiffness, Bending and Torsion (TE16)

THEORY OF MACHINES:

- Free Vibrations (TM164-167)
- Free and Forced Vibrations (TM1016V)

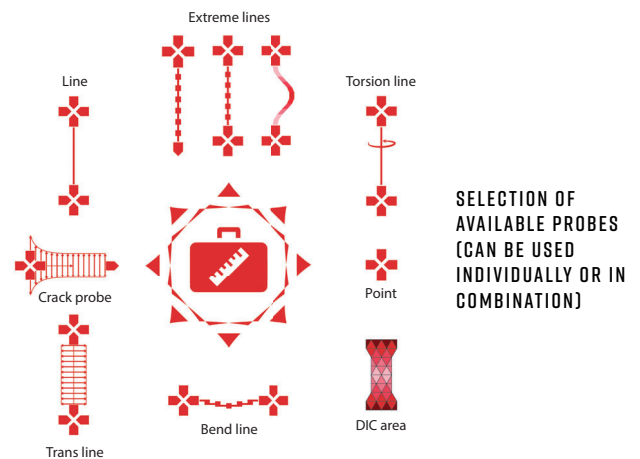
*Sample results available for these experiments/products

DefleX®-2D can be used as a complementary learning aid to TecEquipment products (the above list is not definitive) and other suitable third-party lab products.

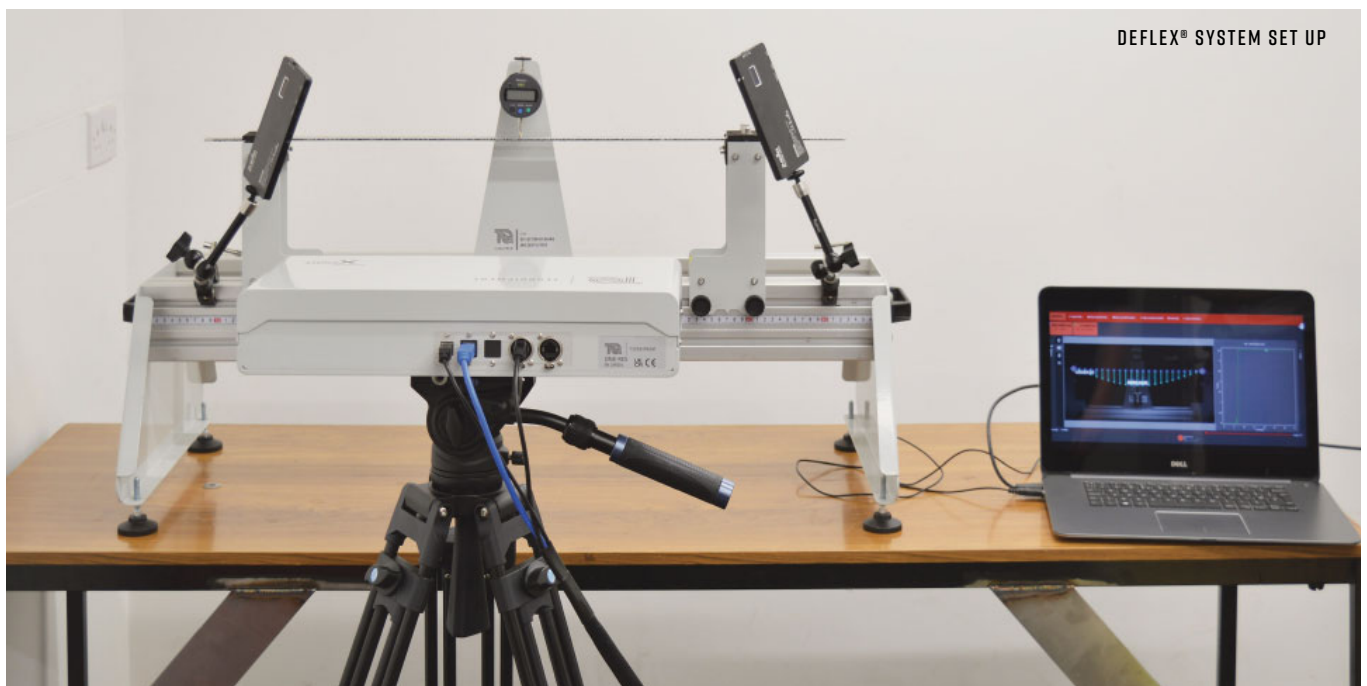
SOFTWARE

DefleX®-2D runs on the integrated DefleX® software to deliver high-quality measurement results while providing an engaging user experience.

- Quick set-up and simple measurement
- Wide range of measurement tools
- Advanced DIC features and I/O
- Postprocess functionalities
- Several measurement probes allow measurements to be tailored to the experiment being conducted



Measurements taken with DefleX® are performed in real-time and/or utilise a post-processing feature to get the most out of the optical deformation measuring device and acquire the most complex deformation analysis.



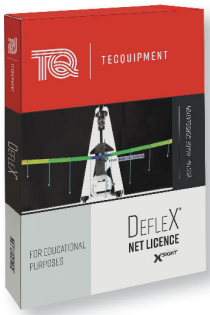
LICENSING

DefleX®-2D comes with a perpetual software licence linked to a USB dongle key. This allows the user to install the software on unlimited computers and use only the one where the licence key is plugged in. This way of licensing makes it easy to switch computer in case of a PC breakdown.

The DefleX® perpetual software licence can be optionally extended by purchasing DefleX®-Net, a batch of 20 annual licences for educational purposes for students at universities and colleges. (NOTE: 2DNet can only be used for educational purposes).

The DefleX®-2D licence is aimed at students at universities, colleges and other specialist training centres and shall only be installed on equipment owned or used by such institutions.

Please contact TecQuipment in the event that you wish to use DefleX® for published research or commercial purposes.



DEFLEX®-NET: OPTIONAL ANNUAL NETWORK LICENCE PACK (20 USERS)

ESSENTIAL SERVICES

ELECTRICAL SUPPLY:

- 100-240 VAC, 50/60 Hz, 0.5 A

MINIMUM COMPUTER HARDWARE:

- 1 x USB 3.0
- 2 x USB 2.0
- Memory 8 GB
- Hard disk 8 GB HDD
- CPU: Intel/AMD 2 GHz 2-core

SUPPORTED OPERATING SYSTEM:

- Windows 11 64 bit / Windows 10 64 bit
- Windows Server 2019 / Windows Server 2022

Latest release on date of purchase

MINIMUM PC OPERATING SYSTEM TO RUN DEFLEX® SOFTWARE:

- Windows 11 64 bit / Windows 10 64 bit
- Windows Server 2019 / Windows Server 2022

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory environment

STORAGE TEMPERATURE RANGE:

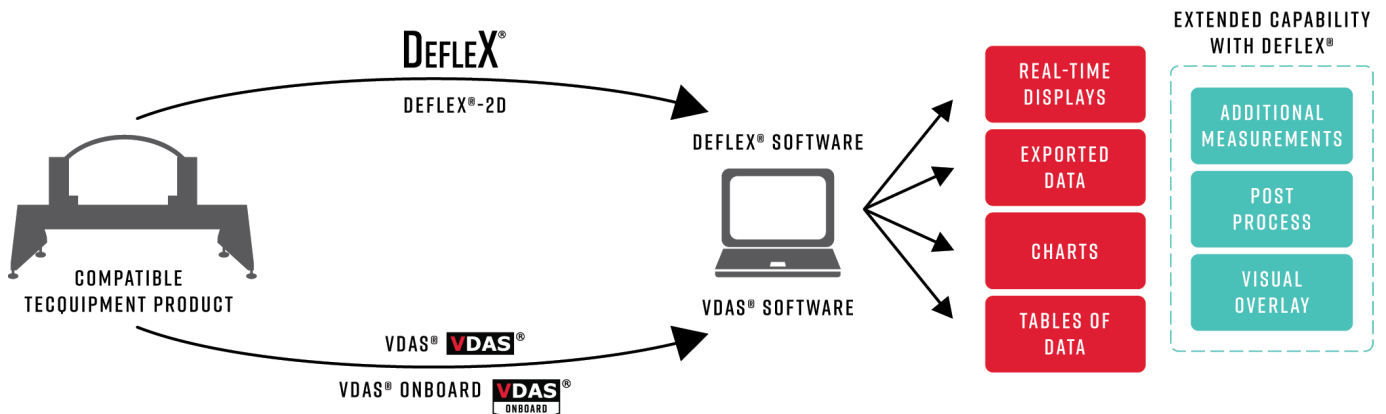
-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

30% to 70%



LENSES

Selecting the right lens can optimise accuracy by maximising the number of available pixels for the measured area.



DEFLEX® LENS08



(SUPPLIED) LENS12



DEFLEX® LENS16



DEFLEX® LENS25



DEFLEX® LENS35



DEFLEX® LENS50



DEFLEX® LENS75

| PRODUCT REFERENCE | FOCAL LENGTH [MM] | SENSOR FORMAT | MINIMAL FOCUSING DISTANCE [MM] | F-STOP | DIMENSIONS [MM] | WEIGHT [G] | FILTER SIZE | MOUNT |
|-------------------|-------------------|---------------|--------------------------------|--------|-----------------|------------|-------------|-------|
| DefleX® LENS08 | 8 | 2/3" | 100 | 2.8 | Ø32 x 35.5 | 60 | M30.5x0.5 | C |
| - | 12* | | 100 | | Ø29 x 43.5 | 60 | M27x0.5 | |
| DefleX® LENS16 | 16 | | 250 | | Ø29 x 29 | 40 | M27x0.5 | |
| DefleX® LENS25 | 25 | | 200 | | Ø29 x 31.5 | 40 | M27x0.5 | |
| DefleX® LENS35 | 35 | | 250 | | Ø29 x 38.5 | 50 | M27x0.5 | |
| DefleX® LENS50 | 50 | | 300 | | Ø29 x 56 | 65 | M27x0.5 | |
| DefleX® LENS75 | 75 | | 400 | | Ø36 x 75 | 100 | M34x0.5 | |

* Supplied as standard

| ISO 9513 class | Field of View [mm] | | Working Distance [mm] | | | | | | |
|----------------|--------------------|-------|------------------------|------|------|------|------|------|------|
| | TECQUIPMENT DIG 2D | | LENS FOCAL LENGTH [MM] | | | | | | |
| | HEIGHT | WIDTH | 08 | 12 | 16 | 25 | 35 | 50 | 75 |
| 0.5 | 190 | 125 | 220 | 344 | 460 | 743 | 1080 | 1583 | 2275 |
| 1 | 380 | 250 | 473 | 718 | 961 | 1512 | 2159 | 3133 | 4572 |
| 2 | 760 | 505 | 980 | 1476 | 1964 | 3049 | 4318 | 6234 | 9166 |

| ASTM E83 class | Field of View [m] | | Working Distance [m] | | | | | | |
|----------------|--------------------|---------|-----------------------|---------|---------|---------|----------|----------|----------|
| | TECQUIPMENT DIG 2D | | LENS FOCAL LENGTH [M] | | | | | | |
| | HEIGHT | WIDTH | 08 | 12 | 16 | 25 | 35 | 50 | 75 |
| A | 3.860 | 2.580 | 5.112 | 7.575 | 10.148 | 15.559 | 21.932 | 31.531 | 46.638 |
| B1 | 19.300 | 12.900 | 25.692 | 37.998 | 50.910 | 78.081 | 109.661 | 157.526 | 233.277 |
| B2 | 38.600 | 25.800 | 51.417 | 76.027 | 101.862 | 156.188 | 219.321 | 315.020 | 465.573 |
| C | 193.000 | 129.000 | 257.217 | 380.257 | 509.478 | 781.045 | 1096.607 | 1574.970 | 2332.963 |

LENS COMPARISON

The chart below details which lenses are suitable for which TecEquipment products along with the approximate optimum working distances for each lens.

| LENS COMPARISON TABLE | | | | | | | | | | |
|-----------------------|--------------------|---------------|-------|---|------------|------------|------------|------------|------------|------------|
| PRODUCT CODE | RECOMMENDED LENSES | FIELD OF VIEW | | OPTIMUM WORKING DISTANCE FOR EACH LENS (CM) | | | | | | |
| | | HEIGHT | WIDTH | 8 MM LENS | 12 MM LENS | 16 MM LENS | 25 MM LENS | 35 MM LENS | 50 MM LENS | 75 MM LENS |
| STS4 | 8, 12, 16 | 400 | 600 | 65 | 100 | 130 | 205 | 285 | 405 | 610 |
| STS10 | 8, 12, 16, 25 | 333 | 500 | 55 | 85 | 110 | 170 | 240 | 340 | 510 |
| STS11 | 8, 12, 16, 25 | 333 | 500 | 55 | 85 | 110 | 170 | 240 | 340 | 510 |
| STS14 | 8, 12, 16 | 480 | 720 | 80 | 120 | 160 | 245 | 340 | 490 | 730 |
| STS15 | 8, 12, 16 | 500 | 750 | 85 | 125 | 165 | 255 | 355 | 505 | 760 |
| STS16 | 12, 16, 25, 35 | 200 | 300 | 35 | 50 | 70 | 105 | 145 | 205 | 310 |
| STS18 | 8, 12, 16, 25, 35 | 250 | 375 | 45 | 65 | 85 | 130 | 180 | 260 | 385 |
| STS19 | 8, 12, 16, 25 | 333 | 500 | 55 | 85 | 110 | 170 | 240 | 340 | 510 |
| SM1000 | 12, 16, 25, 35, | 200 | 300 | 35 | 50 | 70 | 105 | 145 | 205 | 310 |
| SM1002 | 25, 35, 50, 75 | 100 | 150 | 20 | 25 | 35 | 55 | 75 | 105 | 160 |
| SM1004 | 8 | 900 | 1350 | 145 | 220 | 290 | 455 | 635 | 910 | 1360 |
| SM1006 | 12, 16, 25, 35, 50 | 150 | 225 | 25 | 40 | 50 | 80 | 110 | 155 | 235 |
| TM161 and 164-167 | 8, 12, 16 | 600 | 1000 | 100 | 150 | 195 | 305 | 425 | 605 | 910 |
| TM1021V | 8, 12, 16, 25 | 300 | 450 | 50 | 75 | 100 | 155 | 215 | 305 | 460 |
| TE16 | 12, 16, 25, 35 | 333 | 500 | 55 | 85 | 110 | 170 | 240 | 340 | 510 |
| TM1016 | 8, 12, 16 | 533 | 800 | 90 | 130 | 175 | 270 | 380 | 540 | 805 |
| MF40 MkII | 8, 12, 16, 25, 35 | 250 | 375 | 45 | 65 | 85 | 130 | 180 | 255 | 385 |

NOTE: It is possible to get good data with any combination of the product and lenses. The boxes shaded green are however recommended.

INTRODUCTORY VIDEO

