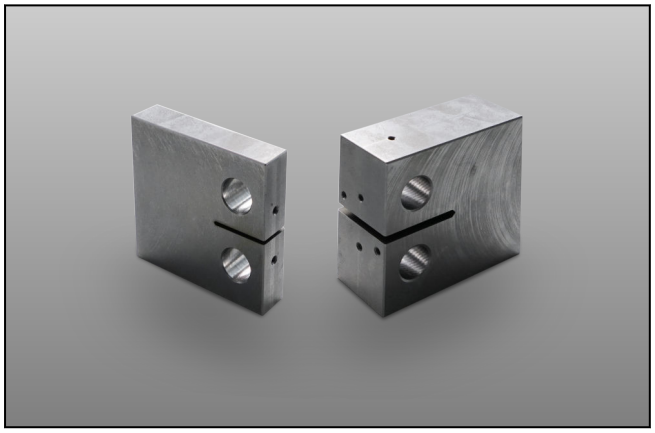
Zwick / Roell

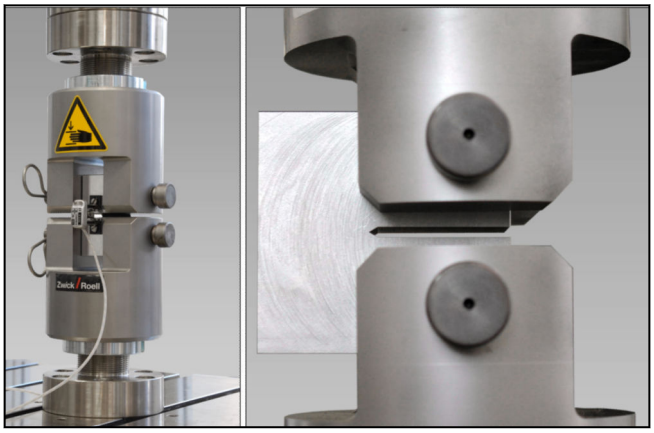
Product Information

testXpert R fracture mechanics da/dN testing software for determination of crack growth as per ASTM E647

CTA: 26863 204385



Left: CT-Specimen with W/B=4 – common geometry for ASTM E647, right: CT-Specimen with W/B=2 – common geometry for ASTM E399



Fracture mechanics specimen with crack opening displacement extensometer

CTA: 213076

The crack growth of a material is described in the crack growth curve (Paris line). This curve is divided into three regions.

- The region with a low crack growth rate and initial value dK_{th} at which the crack growth starts.
- The region in which the crack growth increases proportionally with the delta of the stress intensity (region II)
- The region with a high crack growth rate, which ends with fracture.

A special test program is available for testXpert Research for the determination of crack growth in regions I and II to ASTM E647.

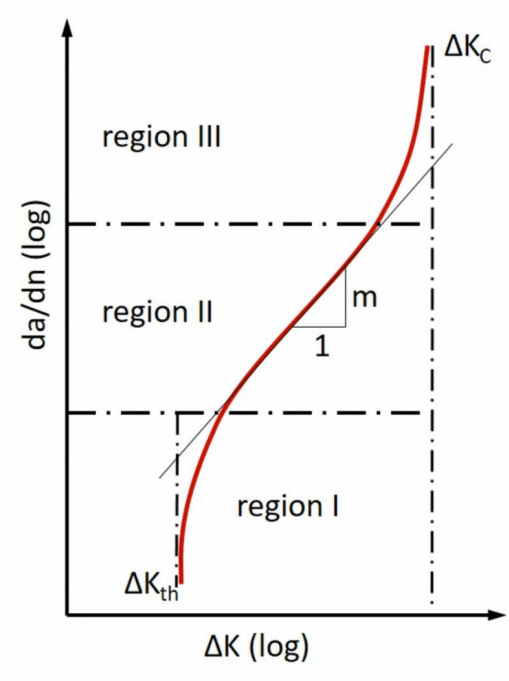
With this test program, both pre-cracking and the determination of the crack growth curve can be carried out.

The crack length is calculated using the compliance method, which determines crack growth with a clip-on extensometer. For pre-cracking the operator can specify the pre-cracking method (e.g. constant stress intensity K, constant force F) as well as the target value of the crack length.

For the actual performance of the test, different types of loading such as:

- Decreasing stress intensity through force shedding
- Increasing stress intensity through constant force amplitude ΔP, can be selected

With these types of loading, the characteristic values ΔK_{th} and $m_{Paris\text{-}Line}$ (=gradient in region II of the crack growth curve) can be determined automatically. All results and recorded data can be exported in CSV file format for further processing.



Crack growth curve (Paris line) - crack growth da/dN dependent on the stress intensity ΔK

PI843 723

Product Information

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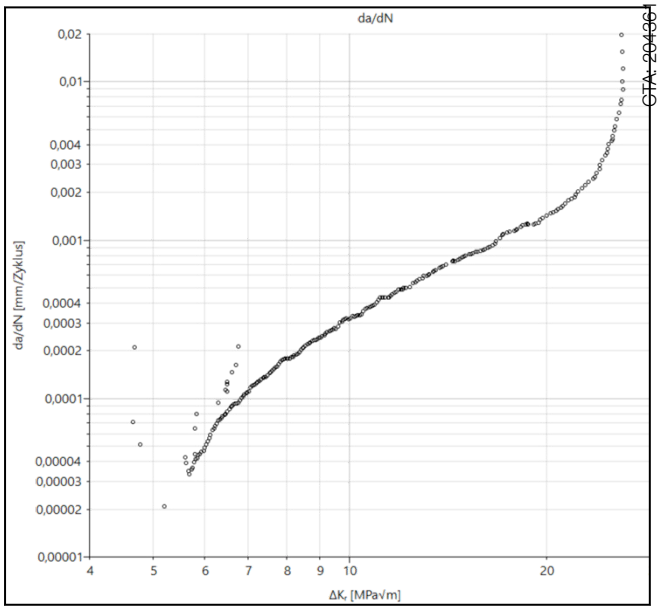
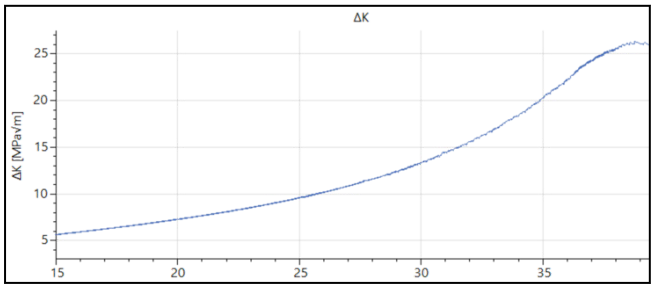
CTA: 233397



CTA: 204361

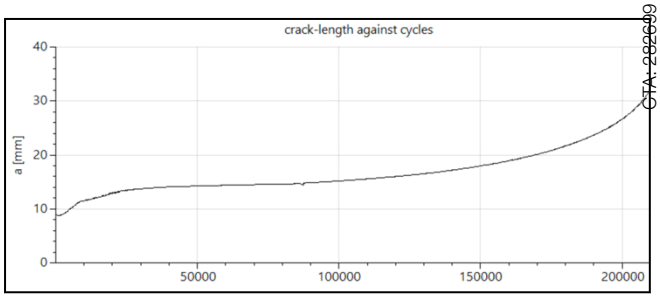
Representation of the Paris line (da/dN)

CTA: 233397



Representation of stress intensity (ΔK) over crack length (a)

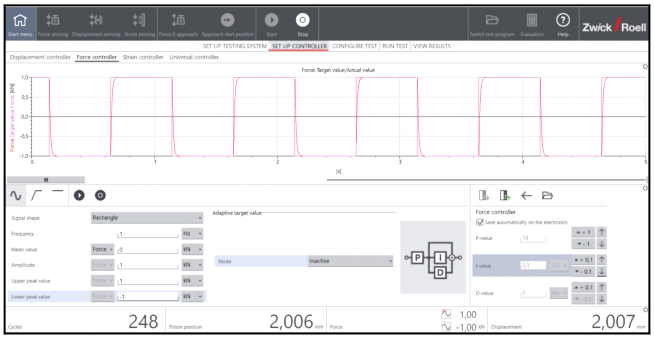
CTA: 233397



CTA: 262699

Representation of crack length (a) over number of cycles

The controller PID settings, test-sequence parameters and results are stored together in one file. This information remains permanently available.

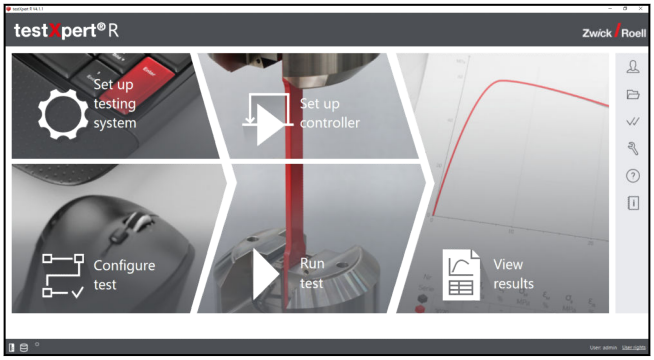


Input mask of control parameters

The design of all testXpert R test programs is workflow oriented and mirrors a lab's operating processes. This guides the user through the test with logical and traceable steps:

1. Set up testing system
2. Set up the controller
3. Configure the test
4. Run the test
5. View the results

This structure, as well as the software interface are almost identical to the software for static tests: testXpert III. Therefore the training requirements are minimized and laboratory personnel can operate diverse ZwickRoell machine types in a short time.



Start screen testXpert R - workflow oriented design

All data at ambient temperature.

Subject to change in the course of further development.

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Description	ArticleNumber
testXpert R, test program, ASTM E647, da/dN	**1070893**
tXp R, master test program, metals industry package - fracture mechanics Includes testXpert Research master test programs for performing the following standard-compliant tests: • ASTM E 399, K1C • ASTM E 647, da/dn • ASTM E 1820, J1C • ISO 12135 quasi-static fracture toughness	**1118638**