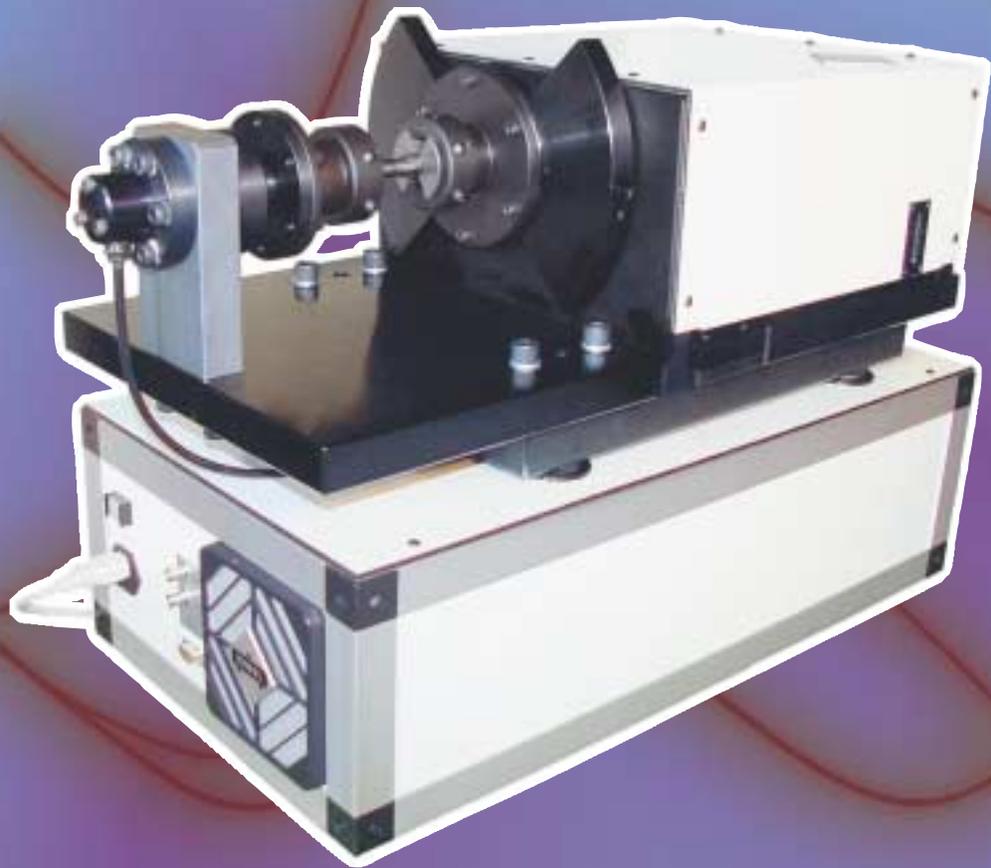


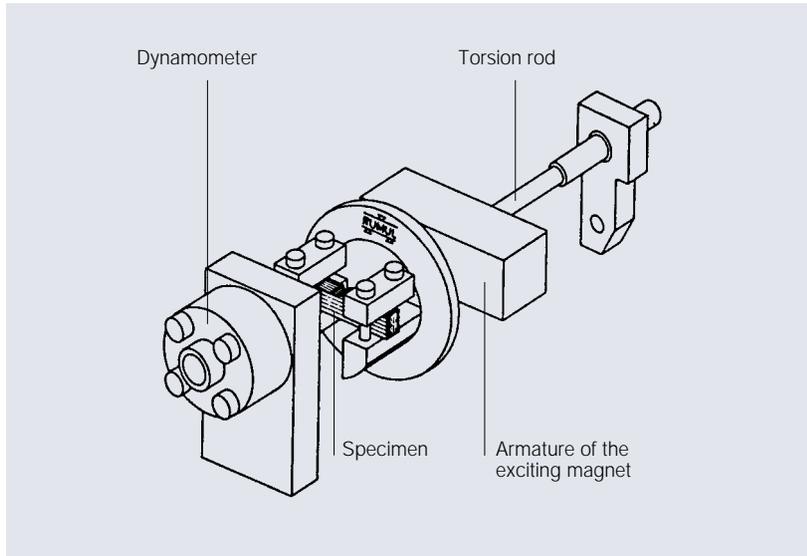
# CRACKTRONIC

Resonant testing machine as table model  
for dynamic bending load applications  
testing frequencies 40 – 300 Hz



RUSSENBERGER PRÜFMASCHINEN AG

# CRACKTRONIC



## General

Mainly two observations in dynamic material testing were the reasons to develop the CRACKTRONIC

- A high number of tests are done with low loads
- For bending load tests instead of axial loading (tension/compression) such a small and low cost machine is favorable.

In addition a lot of tests are to be done on small specimens. Evaluations of fatigue crack growth rates are comfortably done with our crack length measuring system FRACTOMAT and our SOFTWARE.



## Functional description

The kinematic conditions allow a pure bending between the gripping heads. An electromagnetic driven resonator, built as a rotary oscillator, creates an appropriate bending moment. Independent to the dynamic drive a static moment is possible to be applied to the specimen via a torsion rod.

## Main applications

- Fatigue tests / S/N-diagrams
- Fatigue crack growth / da/dN-curves
- Precracking of fracture mechanic specimens also in «hot cells»
- manufacturing quality control in connection with special custom-tailored devices

# CRACKTRONIC

## Machine design

The CRACKTRONIC is used for many different testing applications where an easy and fast change of mounted gripping heads is essential.

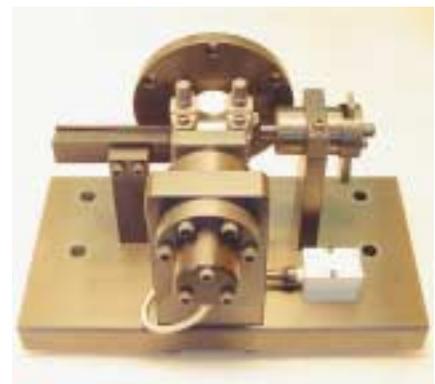
Due to a conceptual separation of the testing machine into a **basicmodule** with all drives and easily **mountable gripping heads** for the specimens a change of the gripping head can be done within a few minutes. Each gripping head contains a complete fixation with an adequate sensor and measuring preamplifier.

Essential features of the mechanical conceptions are beside the modular design the adjustable magnet which gives much more flexibility for testing soft specimens and to realize custom-tailored solutions at cost-saving conditions (for components, hot cell, corrosion, etc.).

The CRACKTRONIC is equipped with the control unit **CREDO** and a PC workstation to operate the easy to use RUMUL software.

## Control conception

The RUMUL control unit **CREDO** is designed as a compact adaptive testing system. The twin computer concept allows a consequent separation in functions. The operating system runs under WINDOWS. All measuring data are processed on-line by the main control program in the process computer.



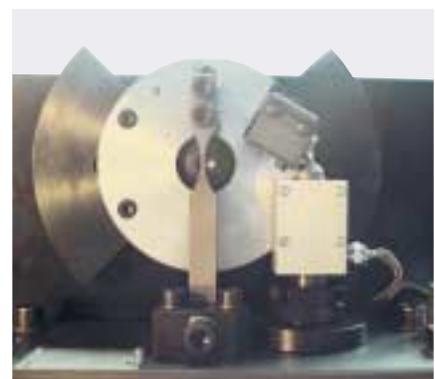
Gripping head for «hot cell»



Gripping head for sheet metal tests



Examples of specimens



Gripping head for customer designed specimen

# CRACKTRONIC

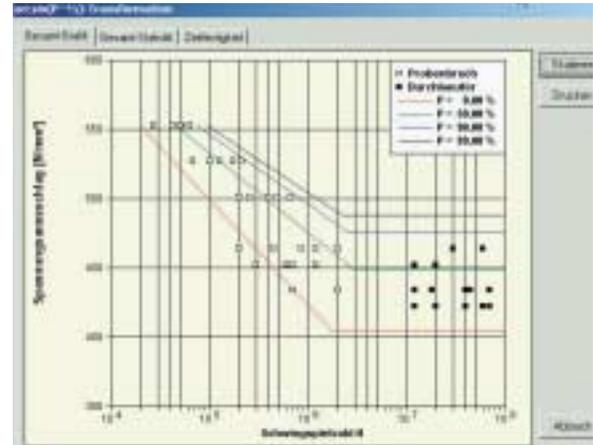
## SOFTWARE-PROGRAMS

### Fatigue tests

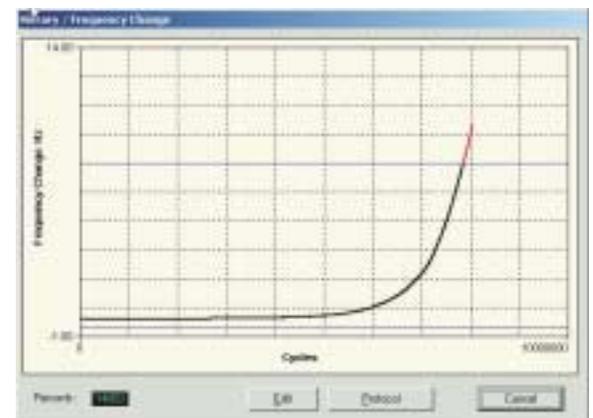
Due to the low power consumption (approx. 5 W) and the high testing frequencies the CRACKTRONIC is well suited for fatigue tests. In connection with the RUMUL SOFTWARE different evaluation methods are available;

- arc sin  $\sqrt{p}$  Transformation
- Weibull procedure
- Perlschnur (regression)
- stair case method

There are integrated diagram-functions as well as ASCII-files for customer made evaluation software available.



Arc sin  $\sqrt{p}$  Transformation



History-record frequency drop



Frequency drop / load adjustment

## Precracking

If fracture mechanics specimens need a fatigue crack (precrack), the CRACKTRONIC is the best solution for precracking of small specimens.

The RUMUL SOFTWARE supports the precracking procedure efficient and reliable.

The SOFTWARE takes care to reach the final cracklength in several loadsteps to make sure that the procedure is in accordance with standards.

# CRACKTRONIC

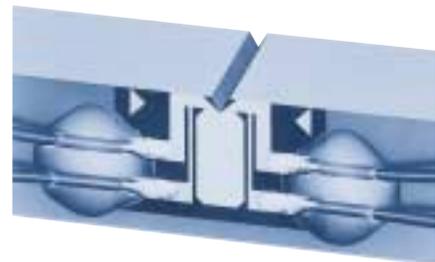
## SOFTWARE-PROGRAMS

### Fatigue crack growth

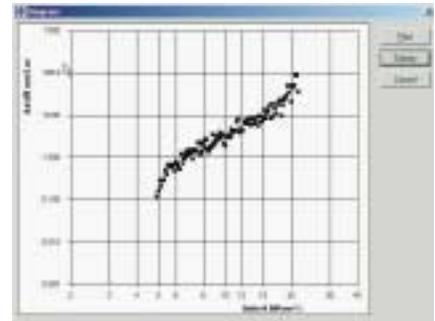
The CRACKTRONIC, appointed as a cyclic load system for bending specimens, combined with KRAK GAGES and the crack measuring system FRACTOMAT are an ideal configuration for receiving  $da/dN$  data. The machine is able to be controlled manually via the cracklength indicated on the FRACTOMAT. In connection with a PC and the RUMUL SOFTWARE an automated testing procedure (i.e. Threshold) is on disposal. The operator is free to change test modes at any time in order to receive new stress intensity values. The current  $da/dN$  curve is on display during the test.



FRACTOMAT



Applied KRAK GAGE



da/dN diagram



Examples for KRAK GAGES

# CRACKTRONIC



**Bending tests**  
mounted gripping head for specimens  
up to 10x10 mm

160 Nm mounted gripping head for  
specimens up to 12x24 mm



**Bending tests**  
on metal sheet

**Tension/compression tests**  
mounted gripping head for specimens CT 1/4"

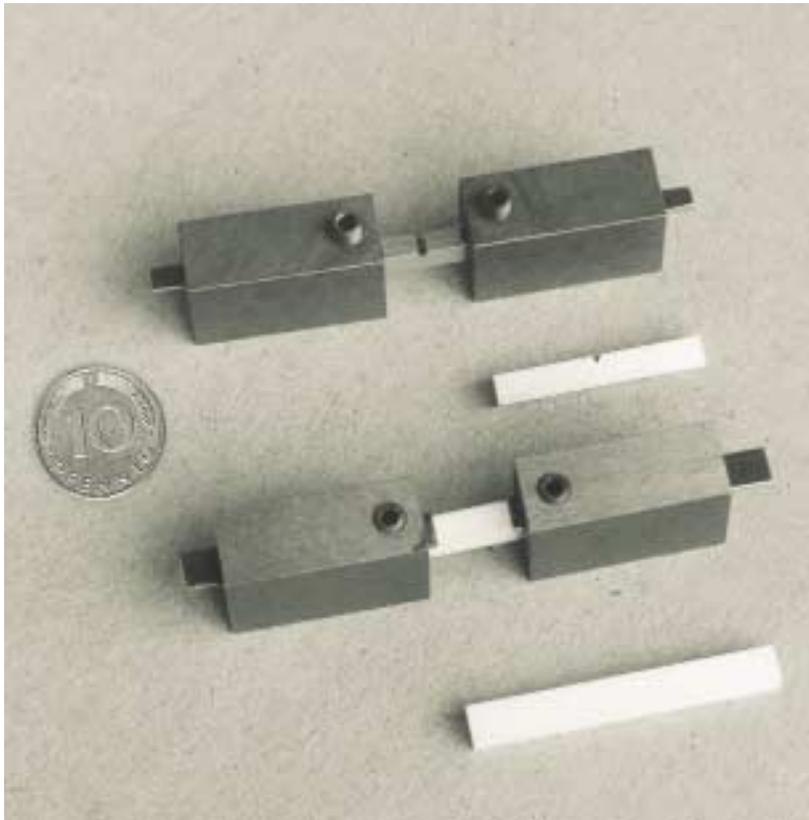


**Torsion tests**  
mounted gripping head for torsion  
tests

# CRACKTRONIC

## Mini-Charpy specimens

adapter pieces for mini specimens  
3x4x27 mm or customized shapes



## Technical specifications

max. bending moment:	$\leq 160$ Nm
max. dyn. bending moment:	$\leq 160$ Nm
max. stat. bending moment:	$\leq 100$ Nm
max. tension load (with tension/compression module):	$\leq 8$ kN
max. testing frequencies (depending on the mounted head):	up to 250 Hz, in steps
max. oscillating angle (depending on the mounted head):	$\pm 3^\circ$ , adjustable
max. specimen dimensions for bending:	24x12x120 mm
Dimensions:	BxHxT
– machine:	50x20x32 cm
– control panel:	50x32x37 cm
Weights:	
– machine:	50 kg
– control panel:	30 kg
Power supply:	230 V / 6 A
Options:	<ul style="list-style-type: none"><li>– gripping heads for bending up to 160 Nm</li><li>– device for torsion tests on round specimens (clamping <math>\varnothing</math> 14 mm / 24 mm) or square shapes</li><li>– gripping head for tension/compression up to 8 kN</li><li>– machine controlled by the oscillation angle (analogous to stroke control mode in tension/compression tests)</li></ul>

# Other well proven RUMUL products



Resonant System SWINGER  
efficient equipment for  
alternating bending load



Resonant Testing Machine  
TESTRONIC  
50/100/150/250 kN



Crack Length Measuring System  
FRACTOMAT for measuring cracks  
in fracture mechanics



Resonant Testing Machine  
MIKROTRON  
5/20 kN



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