Panasonic

PIDEU High Current Test Equipment

Generating DC currents up to 35kA

Capacitor bank, built specifical for testing automotive high voltage components in short circuit situations

The Panasonic High Current Test System is able to generate and control very high DC currents in a safe environment. Several types of components can be tested, for example:

- Pyrotechnical and mechanical circuit breakers
- Melting fuses
- Relays, Contactors
- Resistors
- Grounding cables
- Cable shielding
- Capacitors

Service and technical data

Technical basic data	
Voltage	0 – 1.000V DC
Current	0 – 30.000A >500V DC 0 – 35.000A <500V DC
Energy	Up to 900kJ
Inductivity	>6µH <500V DC >8µH >500V DC
Capacitor bench	7,2F max

Outstanding services:

- 2 technician for support and operation
- Flexible to realize customer test application
- Central geographical location in EU
- Follow up analyses (X-ray, material) is possible
- Shielded area for testing and meeting

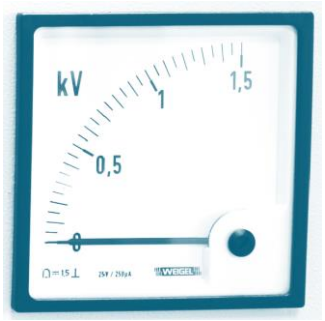
Measuring Equipment

Measuring Equipment	
Oscilloscope	8 Channels, 12 bit
Aux trigger output	4 Signals, adjustable timing
High speed camera	Up to 30000 fps

Due to the high capacity of our test system, voltage value is decreasing much slower than standard capacitor benches while discharging.

This allows:

- Melting fuse tests with nearly constant current and high remaining voltage after separation
- Melting fuse tests at low inductances and therefore high breaking currents, as to be expected in automotive applications
- Observing electrical arc behavior at constant input current/voltage
- Testing components with high energy absorbing features
- Qualification of circuit breakers at designated inductance values



Typical tests

Relay opening 2 kA / 400 V / 20 µH

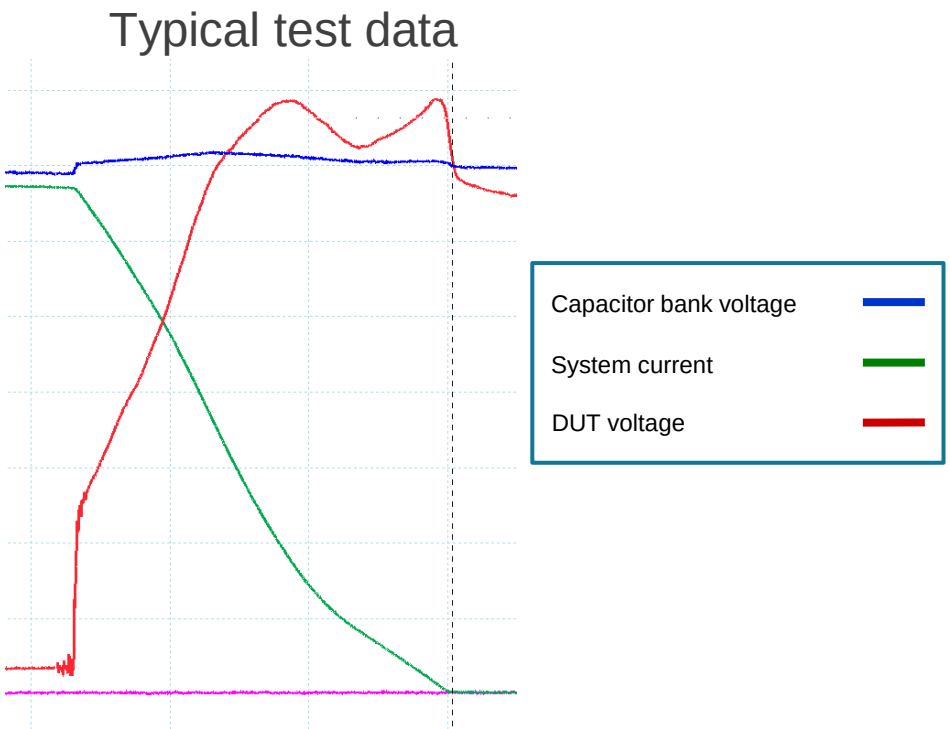
Short circuit cutoff 20 kA / 880 V / 8 µH

Short circuit cutoff 24 kA / 475 V / 120 µH

Melting fuse test 5 kA / 480 V / 6 µH

Results (Examples):

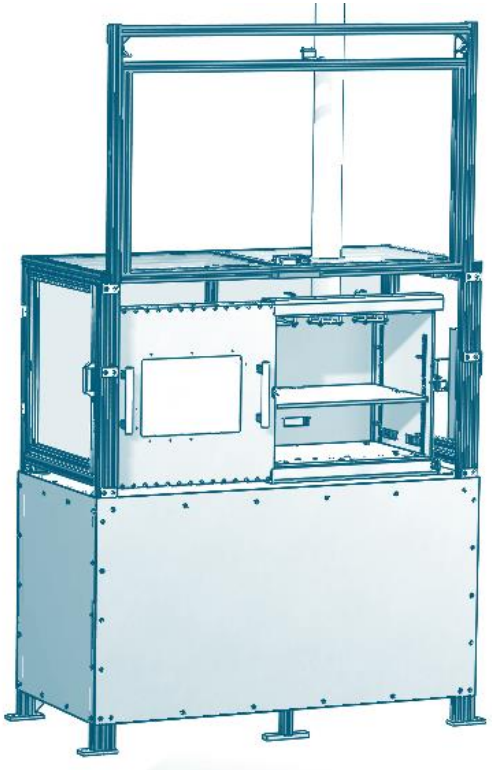
- Opening time of separation elements
- Value of voltage spikes
- Electric arc voltage
- Delay time for pyrotechnical switches



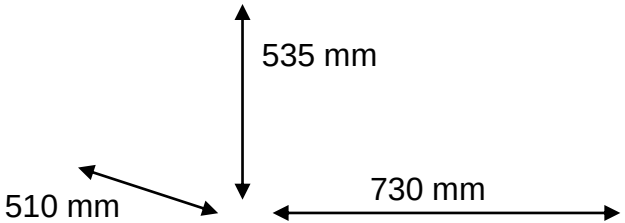
Panasonic

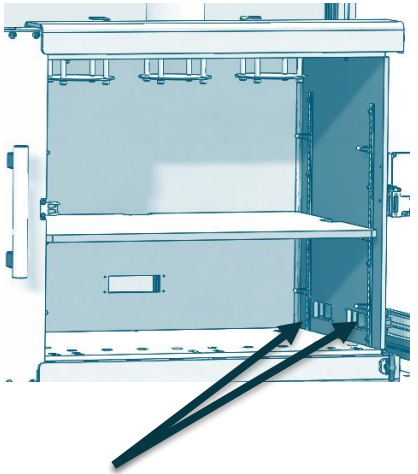
Pictures of the facility

Safety chamber



Inner dimensions
730*510*535 mm

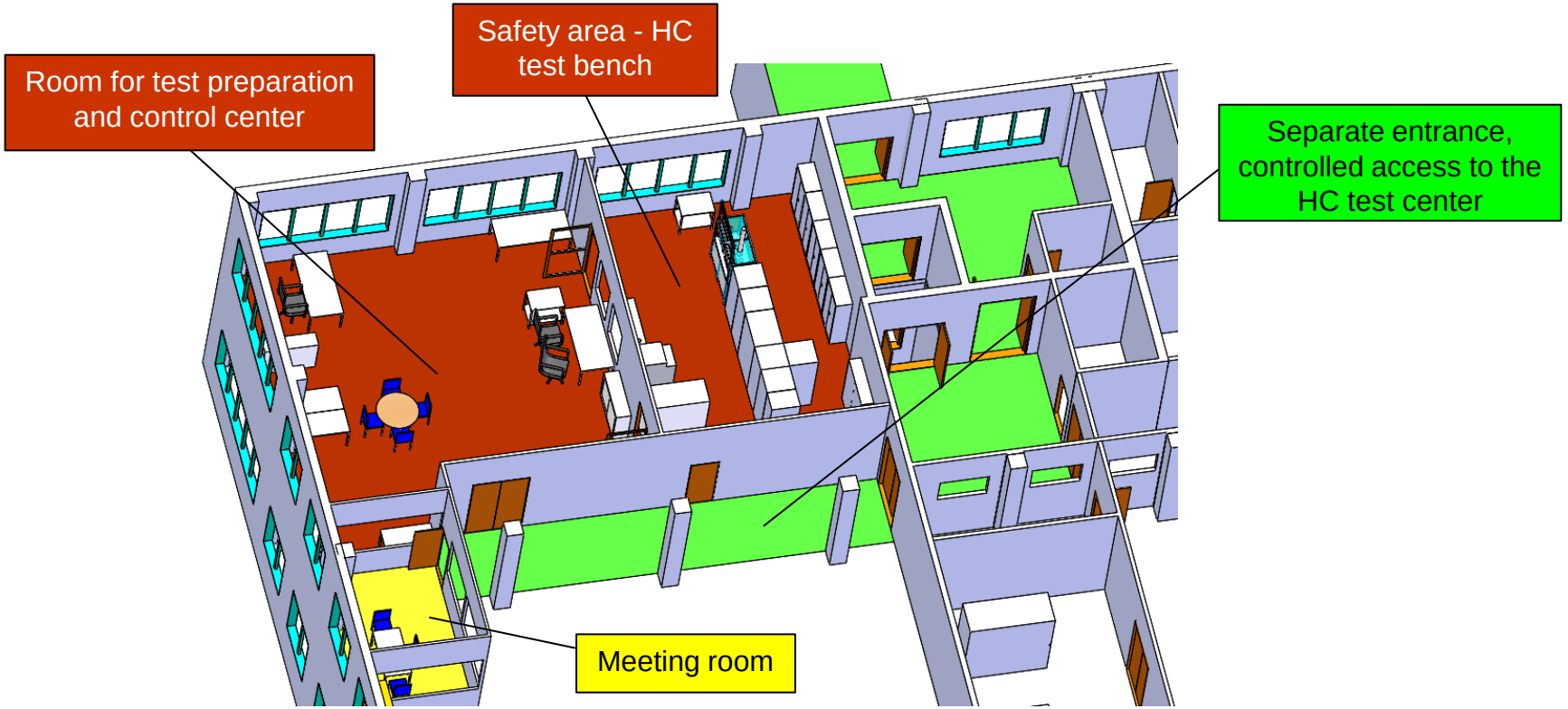




Connecting cable inlets

Capable for withstanding pyrotechnical tests
- Massive steel construction
- Double safety box-in-a-box design
- Ventilation

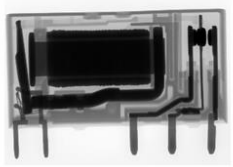
Layout - ISM Zone



Panasonic

Analytics Equipment

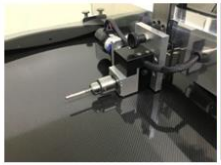
X-Ray Imaging



Nikon XT V 160

- Take a look into parts without destruction
- Detection of broken bonding wires
- Detection of voids in plastic materials or in solder joints
- Live image while switching
- Automated processes and measurements

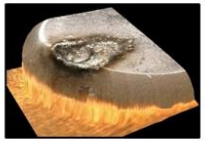
X-Ray CT



Nikon XT V 160

- 3D X-ray imaging
- Virtual cross-sections in arbitrary layer
- 3D measurements
- Nominal/actual comparison
- Porosity analysis
- Wall thickness analysis

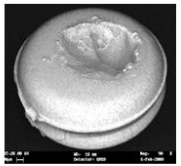
Digital Microscope

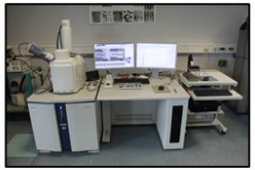


Leica DVM6 A

- Images with a large depth of focus
- 3D imaging
- Image stitching
- Measurements in 2D and 3D

Scanning Electron Microscopy (SEM)

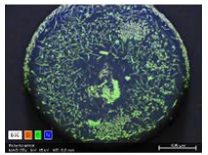




SEM: HITACHI SU3500

- Detection of small contaminations down to nm-sizes
- Layer thickness measurements of thin layers
- Resolution: down to 3,0nm
- Variable pressure function
- Live 3D and anaglyph images

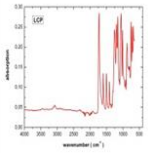
Energy Dispersive X-Ray Spectrometer (EDS)



EDS: Bruker Xflash 6|30

- SDD detector
- Spatially resolved elemental analysis
- Elemental distributions can be displayed by a 2D mapping
- Standard-free quantitative analysis
- Automated particle analysis

Fourier Transform Infrared Spectroscopy (FTIR)

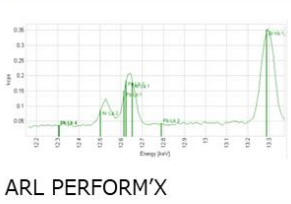


iN10 with iZ10

- Identification of organic substances like plastics and also liquids, oils, greases
- With microscope also small organic particles can be identified
- Mapping option
- Incoming inspection of plastic material

Analytics Equipment

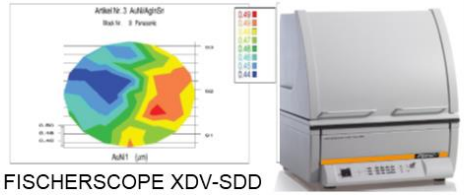
WDX-RF Spectrometer



ARL PERFORM'X

- Determination of elemental compositions with concentrations in the ppm range
- Material analysis (RoHS)
- Small spot analysis (0,5mm)

X-Ray Layer Thickness Measurement



FISCHERSCOPE XDV-SDD

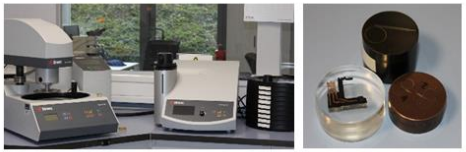
- Fast layer thickness measurement without preparing cross sections
- Material analysis with good spatial resolution
- Basic RoHS measurements

DSC (Differential Scanning Calorimetry)

Netzsch DSC 204 F1 Phoenix

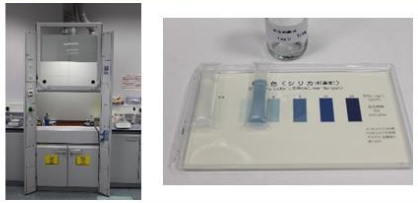
- Determination of melting temperatures and energies
- Incoming inspection of plastic material
- Failure analysis of plastic parts
- Characterization of plastic parts

Cross Section Preparation



- Preparation of cross sections
  - Determination of riveting quality
  - Determination of inner structure of layered materials

Chemical Laboratory



- Test for organic silicone
- Test for Cr6+ (RoHS)

Leakage Tester

Thomas T-201P

- Bubble tester
- Fluor-carbon liquid