



## MTS Direct Current Potential Drop (DCPD) Solution

Integrated software & hardware package allowing accurate and efficient measurement of fatigue crack growth

### Key Features:

- » Compatible with MTS Series 318 and MTS Landmark™ test systems for electrical isolation
- » Integrates with MTS FlexTest Controller (Model 40) and MTS TestSuite Software
- » Designed for low noise
- » Modular Preamplifier maintains signal integrity
- » Compliant to CE, CSA and NRTL
- » Available with advanced consultation, template changes and training

Direct Current Potential Drop (DCPD) measures the change in resistance of a specimen, which correlates directly with crack growth. It is an effective way to collect fatigue crack growth data in high-temperature tests and other challenging environments. DCPD is used to overcome the challenges that make contact extensometry and compliance calculations impractical for crack length measurement. Unfortunately, to get the best results, some DCPD solutions require excessive set-up time while others limit flexibility.

The MTS DCPD Solution features integrated software and hardware for test control, data analysis, and results reporting. It greatly simplifies DCPD test configuration using the powerful automation tools built

into MTS TestSuite™ software. Integrated into MTS FlexTest® 40 Controllers and MTS TestSuite Software, the MTS DCPD solution eliminates the challenges that can arise with non-integrated components from multiple suppliers. This provides a convenient and comprehensive way to incorporate DCPD into your material testing programs.

This solution uses the reversing DCPD method. By monitoring load and potential (voltage) data from a loaded specimen and a reference specimen, it determines crack length by calculating ratios of potential on both. Applying a calibration equation to the ratios produces the crack length. The current is switched on and off (reversed) to correct for thermocouple effects.

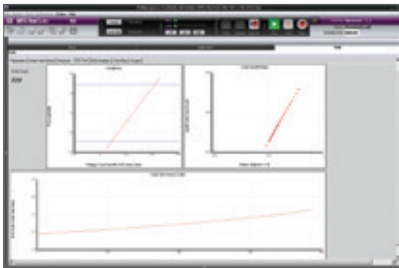
## Comprehensive DCPD solution

This solution offers a comprehensive approach for adding DCPD to your materials testing program. It includes the software and hardware required for integrated DCPD test development and execution. The MTS DCPD Testing Solution includes:

- » High-fidelity MTS DCPD Measurement System (2- or 7-channel configuration)
- » Modular Preamplifier(s)
- » MTS TestSuite DCPD Module (includes all test templates, report templates and calculations for ASTM-compliant fatigue crack growth assessments)
- » MTS TestSuite Fracture Analyzer software
- » Setup specimen kit for verifying hardware setup and test configuration
- » Setup, installation and equipment verification by MTS

## MTS TestSuite DCPD Module

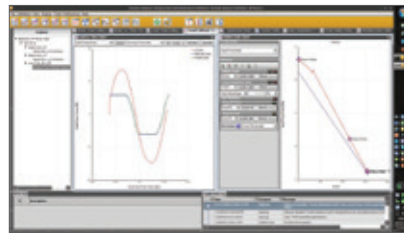
The MTS TestSuite DCPD Module measures crack length via a voltage that is correlated to the crack length. It also measures a reference specimen to correct for fluctuations in current or specimen conductivity during tests. The DCPD module is capable of reversing the power supply current to correct for thermoelectric voltages. Users can enter specific DCPD calibrations for non-standard lead placement or non-standard geometries.



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## MTS TestSuite Fracture Analyzer

The Fracture Analyzer is needed to process test data and calculate actual fracture results such as fatigue crack growth validity criteria and toughness values. The Fracture Analyzer provides a standalone package for digging deeper into a test run's data. Easily conduct custom, in-depth analyses of test data to create informative results. An advanced data tool allows users to post-process test data. You'll be building a useful library with each completed analysis, which can be leveraged to efficiently meet your analysis requirements. You can also generate analysis reports with the optional MTS TestSuite Reporter Add-In (additional license required).



## High-fidelity MTS DCPD Measurement System

The MTS DCPD Measurement System is a remotely controlled unit that supplies power for the current used to develop the voltage drop in the specimen. There are three modes of current switching available including fully reversing, always on, or on/off. Current reversing reduces errors introduced by possible changes in specimen temperature. The unit provides 1x or 10x amplification of the potential signal drop, and preamplifiers located near the specimen have 5000x amplification to maintain exceptional signal integrity. The solution monitors multiple voltages, the test specimen and the reference specimen. Typically, the test specimen is a cracked, loaded specimen while the reference specimen can be either a separate non-loaded specimen or a region of the test specimen that is not cracked. A terminal block connection offers a convenient interface for leads reducing the need for custom cabling. This is especially

helpful for consumable leads used in high-temperature testing, which can be changed easily at the terminal block near the specimen.



## Setup Specimen Kit

The solution includes scissors and thin sheet metal specimens, which offer a quick and easy way to confirm the DCPD equipment is functioning properly. After connections to the setup specimen are made, an operator makes a simple cut in it. The software's measurement of this crack can be compared to the graduations printed on the specimen.

### Overall

Current:	Adjustable 0 - 20 Amps DC
Voltage:	5 Volts DC Maximum
Gain:	5,000 or 50,000
Gain Accuracy:	≤2%
Filter:	50 Hz and 300 Hz
Bandwidth:	300 Hz Maximum
Output:	±10 Volts DC

### Main Chassis

Gain:	1 or 10
Gain Accuracy:	≤1%

### Preamp

Gain:	5,000
Gain Accuracy:	≤1%

## Learn more today

Contact your MTS representative to learn more about how the MTS DCPD Testing Solution can optimize efficiency in your testing program.

Specifications subject to change without notice.

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