

# ELTM in ASAP

## Automotive lighting testing for SAE, ECE and FMVSS compliance

This technical publication outlines the steps for using ELTM (Exterior Lighting Test Module), which is an optional add-on to the Advanced Systems Analysis Program (ASAP®) from Breault Research Organization (BRO). ELTM simplifies the task of assuring that your prospective design meet mandatory compliance standards for automotive lighting.

Tabulated results and informative graphics accompany the SAE, ECE, and FMVSS pre-programmed lighting tests. Custom lighting tests can also be added with minimal effort. Since ELTM eliminates the need to implement your test configurations, you can concentrate on innovation and streamlining the design process in a time-sensitive marketplace. With over 160 high-fidelity source models and an expanded CAD interoperability within ASAP, the bottom line is an accelerated design process.

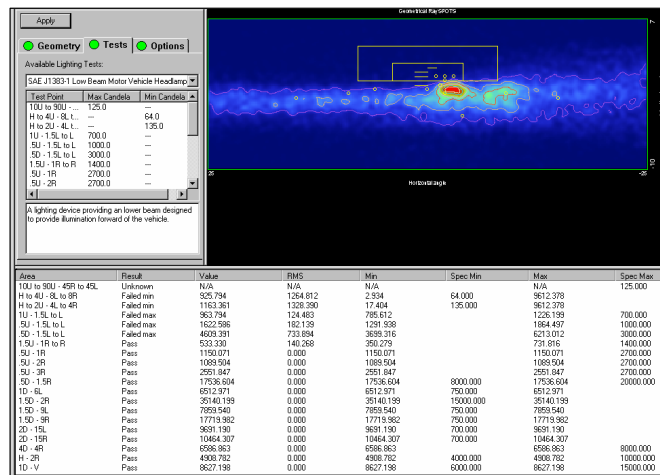


Figure 1 ELTM window after running a low-beam SAE test on a reflector with a 9006 bulb

The ELTM window includes three tabbed dialogs to assist you in simulated testing: Geometry (input), Tests, and Options (output). Performance results for each test point are displayed in the lower half of the window, and a graphical presentation is displayed in the upper right area once the simulation is complete.

The following steps show a complete walk-through of the ELTM wizard. The settings were used to perform a low-beam test of the reflector with a 9006 bulb.

## Import geometry

- 1 On the Geometry tab, click **Add** to Insert geometry files in the workspace for the test you want to perform.

ELTM supports IGES translations, ASAP scripts, and Builder files.

- 2 Use the BRO Light Source Library Wizard to insert source geometry and pre-defined raysets.

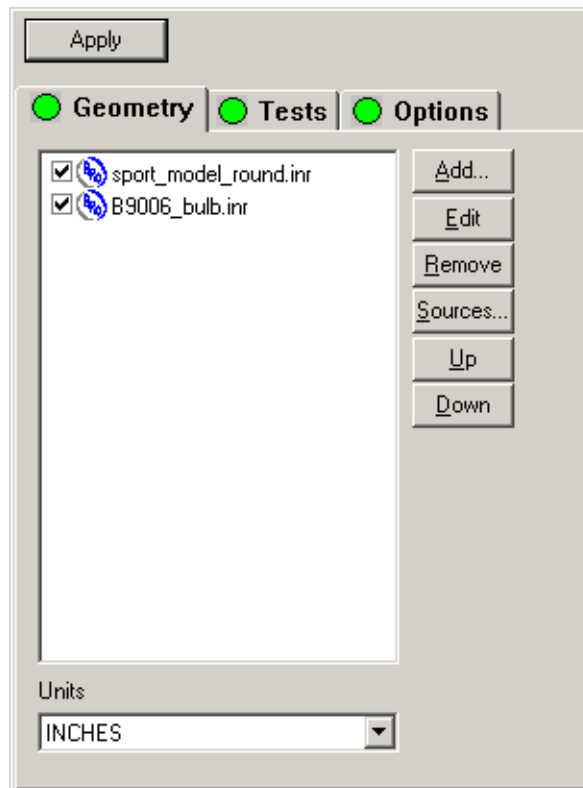


Figure 2 Select the geometry to import

## Select the test

- 3 On the Tests tab, select one of the SAE, FMVSS, or ECE tests. A description is displayed along with a list of specific test points.

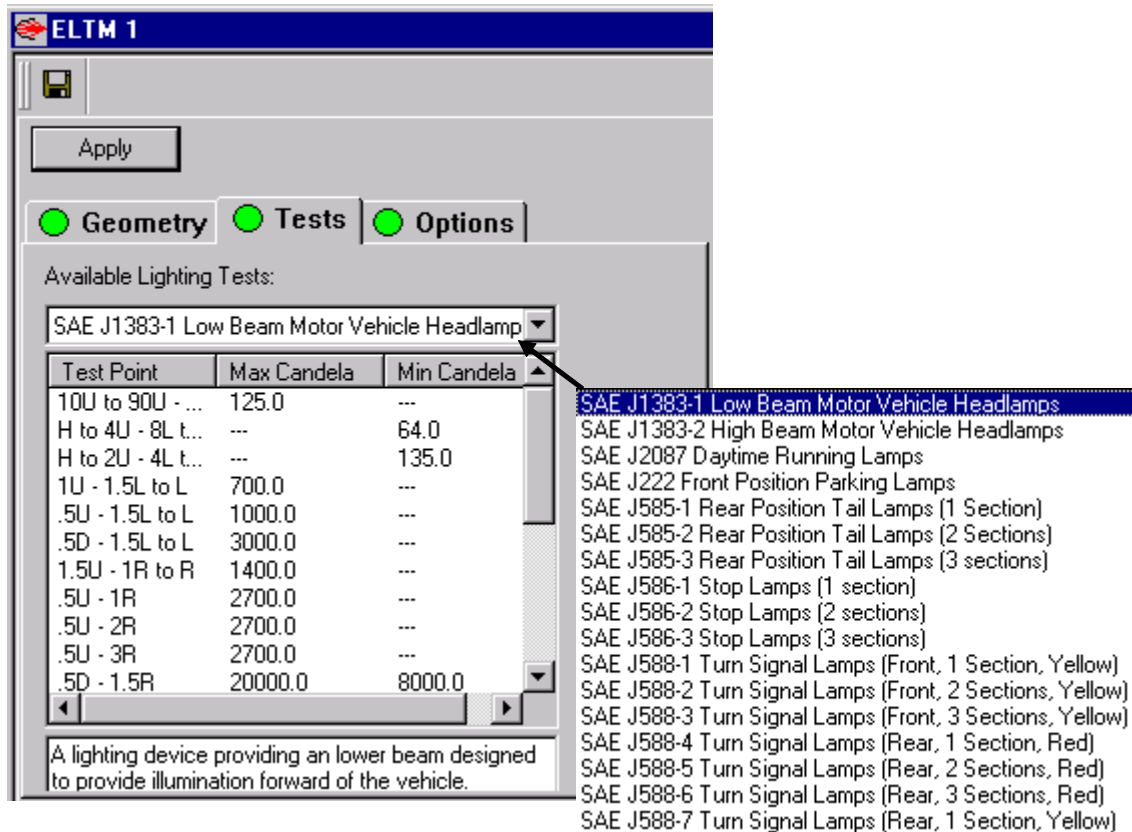


Figure 3 Select one of the SAE, ECE, or FMVSS tests on the drop-down list

**NOTE** A complete listing is in “Supported ELTM Tests” on page 5.

## Output Options

- 4 On the Options tab, select additional graphical output, as well as control over some of the test parameters.

Default settings let you quickly determine compliance with the selected test.

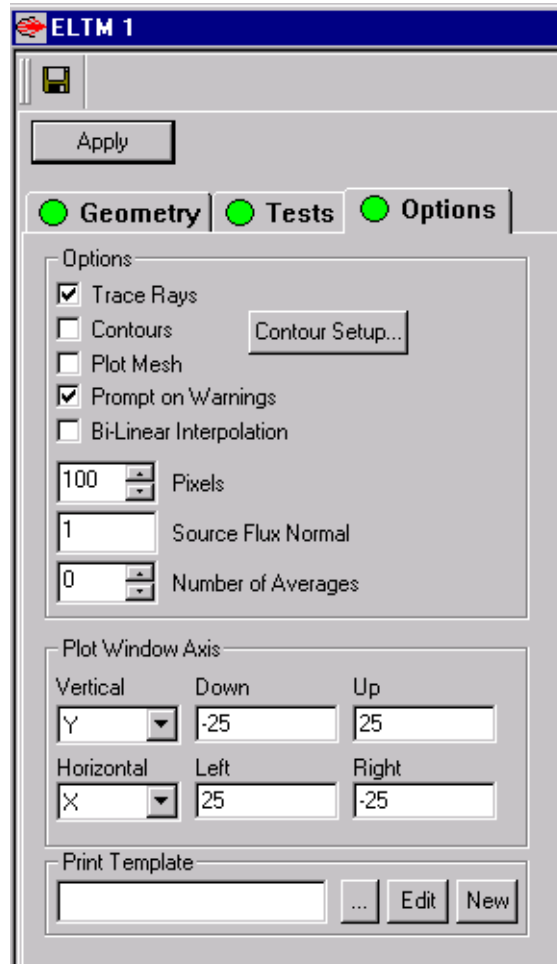


Figure 4 Select output options and settings for plot window axis

## Results

Both a graphical presentation of the test results and accompanying text indicate the pass/fail status of each test point. See Figure 1.



# SUPPORTED ELTM TESTS

**Table 1**

- SAE J581 Auxiliary Driving Lamps
- SAE J582 Auxiliary Low Beam Lamps
- SAE J583 Front Fog Lamps
- SAE J852-1 Left Front Cornering Lamps
- SAE J852-2 Right Front Cornering Lamps
- SAE J1383-1 Low Beam Motor Vehicle Headlamps
- SAE J1383-2 High Beam Motor Vehicle Headlamps
- SAE J2087 Daytime Running Lamps
- SAE J222 Front Position Parking Lamps
- SAE J585-1 Real Position Tail Lamps [1 section]
- SAE J585-2 Real Position Tail Lamps [2 sections]
- SAE J585-3 Real Position Tail Lamps [3 sections]
- SAE J586-1 Stop Lamps [1 Section]
- SAE J586-2 Stop Lamps [2 Sections]
- SAE J586-3 Stop Lamps [3 Sections]
- SAE J588-1 Turn Signal Lamps [Front, 1 Section, Yellow]
- SAE J588-2 Turn Signal Lamps [Front, 2 Sections, Yellow]
- SAE J588-3 Turn Signal Lamps [Front, 3 Sections Yellow]
- SAE J588-4 Turn Signal Lamps [Rear, 1 Section, Red]
- SAE J588-5 Turn Signal Lamps [Rear, 2 Sections, Red]
- SAE J588-6 Turn Signal Lamps [Rear, 3 Sections, Red]
- SAE J588-7 Turn Signal Lamps [Rear, 1 Section, Yellow]
- SAE J588-8 Turn Signal Lamps [Rear, 2 Sections, Yellow]
- SAE J588-9 Turn Signal Lamps [Rear, 3 Sections, Yellow]
- SAE J593-1 Backup Lamps [Single]
- SAE J593-2 Backup Lamps [Double]
- SAE J914-1 Side Turn Signal Lamps [Left]
- SAE J914-2 Side Turn Signal Lamps [Right]
- SAE J1319 Fog Tail Lamp
- SAE J1373-1 Rear Cornering Lamps [Left]

**Table 1**

SAE J1373-2 Rear Cornering Lamps [Right]  
 SAE J1957 Center High Mounted Stop Lamps

FMVSS 571.108.S7.8.5.3-1 Visual Optical Aim [Low Beam - VOL]  
 FMVSS 571.108.S7.8.5.3-2 Visual Optical Aim [Low Beam - VOR]  
 FMVSS 571.108 15-1A Figure 15-1 [Highbeam]  
 FMVSS 571.108 15-1B Figure 15-1 [Lowbeam]  
 FMVSS 571.108 17-1A Figure 17-1 [Highbeam]  
 FMVSS 571.108 17-1B Figure 17-1 [Lowbeam]  
 FMVSS 571.108 27-1A Figure 27-1 [Highbeam]  
 FMVSS 571.108 27-1B Figure 27-1 [Lowbeam]  
 FMVSS 571.108 28-1A1 Figure 28-1 [Highbeam -1A1, 1C1 and 1G1]  
 FMVSS 571.108 28-1A2 Figure 28-1 [Highbeam - 2A1, 2C1 and 2G1]  
 FMVSS 571.108 28-1B Figure 28-1 [Lowbeam]  
 FMVSS 571.108 17-2A Figure 17-2 [Highbeam]  
 FMVSS 571.108 17-2B Figure 17-2 [Lowbeam]  
 FMVSS 571.108 27-2A Figure 27-2 [Highbeam]  
 FMVSS 571.108 27-2B Figure 27-2 [Lowbeam]  
 FMVSS 571.108 28-2A1 Figure 28-2 [Highbeam -1A1, 1C1 and 1G1]  
 FMVSS 571.108 28-2A2 Figure 28-2 [Highbeam -2A1, 2C1 and 2G1]  
 FMVSS 571.108 28-2B Figure 28-1 [Lowbeam]

ECE 1-1 Passing Beam Headlamps [Left hand traffic]  
 ECE 1-1R Passing Beam Headlamps [Right hand traffic]  
 ECE 5-1L Sealed Beam Passing Headlamps [Left hand traffic]  
 ECE 5-1R Sealed Beam Passing Headlamps [Right hand traffic]  
 ECE 5-2L Sealed Beam Passing Headlamps [Left hand traffic]  
 ECE 5-2R Sealed Beam Passing Headlamps [Right hand traffic]  
 ECE 1-2L Driving Beam Headlamps [Left hand traffic]  
 ECE 1-2R Driving Beam Headlamps [Right hand traffic]  
 ECE 6-1 Direction Indicators - 1  
 ECE 6-1a Direction Indicators -1a  
 ECE 6-1b Direction Indicators - 1b



**Table 1**

- ECE 6-2a Direction Indicators -2a
- ECE 6-2b-1 Direction Indicators - 2b [day]
- ECE 6-2b-2 Direction Indicators - 2b [night]
- ECE 7-1 Front Position Lamps
- ECE 7-2 Front Position Lamps
- ECE 7-3 Rear Position Lamps
- ECE 7-4-1 Stop Lamps - S1
- ECE 7-4-2 Stop Lamps - S2 [day]
- ECE 7-4-3 Stop Lamps - S2 [night]
- ECE 7-5 Stop Lamps - S3
- ECE 8-1 Passing Beam Headlamps [Left hand traffic]
- ECE 8-2 Passing Beam Headlamps [Right hand traffic]
- ECE 19-1 Fog Lamps [Angle space]
- ECE 23 Reversing Lamps
- ECE 38 Real Fog Lamps [Angle space]
- ECE 50-7.1 Rear Position Lamps
- ECE 50-7.2 Front Position Lamps
- ECE 50-7.3 Stop Lamps
- ECE 50-7.4.1 Direction Indicators
- ECE 50-7.4.2 Direction Indicators
- ECE 50-7.4.3.1 Direction Indicators
- ECE 50-7.4.3.2 Direction Indicators
- ECE 77-1 Parking Lamps [Forward Facing]
- ECE 77-2 Parking Lamps [Rear Facing]
- ECE 87 Daytime Running Lamps
- ECE 91-SM1 Side Marker Lamps SM1
- ECE 91-SM2 Side Marker Lamps SM2

