



Computing Volumetric Efficiency

Version 6

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Developed by Transportation Laboratories

Version History

Version	Date	Revision Description
1	1/25/2016	Initial publication
2	8/23/2018	Format with SGS Brand
3	4/9/2020	Retrofit to new template
4	12/14/2021	Removed <code>volef</code> usage content from <i>Section 2 Starting the Application</i> on page 2 and added hypertext linked cross-reference to its cyflex.com usage help.
5	6/16/2022	Updated hypertext linked cross-reference to cyflex.com usage description for <code>volef</code> in <i>Section 2 Starting the Application</i> on page 2
6	3/6/2024	Rebrand to TRP Laboratories

Document Conventions

This document uses the following typographic and syntax conventions.

- Commands, command options, file names or any user-entered input appear in Courier type. Variables appear in Courier italic type.
Example: Select the `cmdapp-relVersion-buildVersion.zip` file....
- User interface elements, such as field names, button names, menus, menu commands, and items in clickable dropdown lists, appear in Arial bold type.
Example: **Type**: Click **Select Type** to display drop-down menu options.
- Cross-references are designated in Arial italics.
Example: Refer to *Figure 1*...
- Click intra-document cross-references and page references to display the stated destination.
Example: Refer to *Section 1 Overview* on page 1.
The clickable cross-references in the preceding example are *1*, *Overview*, and on page 1.

CyFlex Documentation

CyFlex documentation is available at <https://cyflex.com/>. View **Help & Docs** topics or use the **Search** facility to find topics of interest.

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1 Overview

Use the `volef` application to compute volumetric efficiency for a single manifold on a continuous basis.

If an engine has multiple manifolds, run this application for each manifold.

This application is usually started in the `go.scp` script that starts CyFlex.

2 Starting the Application

Enter `volef` to start the application.

Refer to [volef](#) usage help on cyflex.com for command syntax.

Appendix A. Specification File

The following is an example spec file used for volef.

```
#####
#line 1
# volef_manifold - the label of the variable where the computed
#                  result will be placed for volumetric efficiency
#                  referenced to manifold pressure and temperature
#
#line 2
# num_cyl        - the number of engine cylinders supplied by this
#                  manifold. This may be specified as a constant
#                  variable, or computed expression. This is normally
#                  n_cyl or "n_cyl / 2[none]", etc.
#
# barometer      - the label of variable where the barometric
#                  pressure can be found
#
# mnfld_pres     - the label of the variable which measures the
#                  manifold gauge pressure
#
# mnfld_temp     - the label of the variable which measures the
#                  manifold temperature
#
#line 3-n      ( enter a line for each gas or air flow stream entering
#                  the manifold )
#
# mass_flow      - the mass flow rate of a flow stream
#                  ( for air, this should be the wet mass flow )
#
# gas composition - the name of a composition variable defining
# variable        the stream. For diesels, this is usually the
#                  inlet air stream. For natural gas engines it
#                  is the stream which contains the mixture of
#                  inlet air and natural gas.
#
# volef_manifold
#   volef_int
#
# num_cyl  barometer  mnfld_pres  mnfld_temp
#   n_cyl   barometer  int_mnf_p   int_mnf_t
#
# mass_flow      gas composition variable
#   air_mtr0_mf   inlet_airC.
#####
```