



# **CyFlex® Computing Gas Stream Composition and Mass Flow**

**Version 7**

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**Developed by Transportation Laboratories**



## Version History

Version	Date	Revision Description
1	1/25/2016	Initial publication
2	6/29/2016	Add note to <i>Appendix A. Specification File</i>
3	8/23/2018	Format with SGS brand
4	4/8/2020	Retrofit to new template
5	12/13/2021	Revised <i>Section 3 Starting the Application</i> on page 3 to remove inline <code>gas_mix</code> usage content and add hypertext linked cross-reference to its usage help on cyflex.com.
6	6/16/2022	Updated hypertext linked cross-reference to cyflex.com usage description for <code>gas_mix</code> in <i>Section 3 Starting the Application</i> on page 3
7	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

The `gas_mix` command computes the composition and mass flow of a gas stream which is the result of mixing of two or more input gas streams.

The command is normally started in the `go` script that starts CyFlex.

## 2 Prerequisites

The computations performed by `gas_mix` rely on known composition and mass flow of the input gas streams. These streams may have known composition defined in a specification file such as might be the case for pure propane or they might be a variable composition derived from computed streams such as computed wet air mass flow or a natural gas analyzer (ONGA).

Configure the `go` script per the following example to enable `gas_mix` computations.

```
#####
#
# Example startup sequence in go.scp
#
#####
# "init_properties" and "init_composition" must precede
# launching of "subsonic"

# init_properties creates the memory for composition and property
# variables

init_properties

# init_composition reads /specs/properties/comp_specs.NNN and initializes
# the values of composition variables to the last value saved when running
# or those permanently defined by a comp.<STREAM> file

init_composition

# update_composition is designed to receive continuous updates of natural
# gas composition from a central gas analyzer
update_composition &

# gas_prop computes the properties of the streams identified in
# prop_specs.NNN

gas_prop 12 1000 /specs/properties/prop_specs.305 +c &

subsonic 12 SLO /specs/subsonic +c &

gas_mix 12 SLO /specs/properties/mix_specs.305 +c &
```

### **3 Starting the Application**

The program is normally started in the `go.scp` startup script and is memory-resident from then on, computing the composition and maximum flow at the rate specified on the command line.

Refer to [gas mix](#) usage help on [cyflex.com](http://cyflex.com) for command syntax.

## Appendix A. Specification File

The following is an example specification file used for `gas_mix`. All variables must be defined elsewhere in the system.

```
##### Example spec file #####
# line 1: identify the output stream composition file and output
stream
#           mass flow variable
#
#           These 2 variables are output variables - they will be
#           modified by the gas_mix application

#Output Stream composition      massflow
faC.                            fa_mf

# line 2-n Identify the input streams which are being mixed - There
must be
#           a composition variable and mass flow for each stream, so
the
#           number of streams which can be mixed is limited by the
current
#           maximum number of composition types (~20).

#Input Streams- this is a list of the streams that are being mixed
#           (1 line per stream)
#composition                    massflow
#                               (note that the input mass flow may be
either
#                               a REAL or STATISTICAL variable)
inlet_airC.                     air_mtr0_mf
ngC.                            ng_mf

#####
```