PD2CAEPIPE™- Plant Design-to-CAEPIPE Translator
(for converting PCF files)

1.0 Installing Program

To install PD2CAEPIPE on Windows NT, load the product CD supplied by InfoPlant and run the program "SETUP.EXE" and follow the instructions as they appear on the screen.

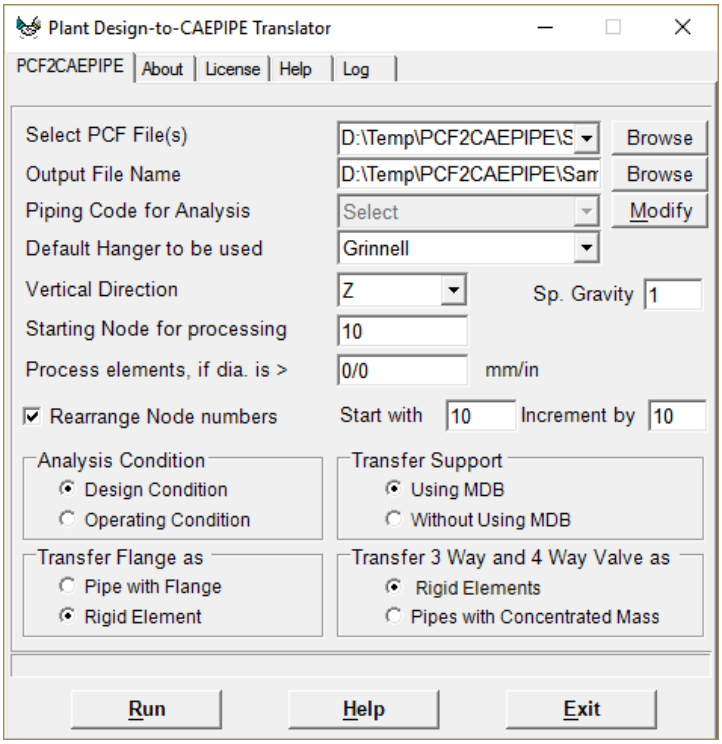
2.0 PCF File Extraction

Refer Plant Design Manuals on extracting PCF Files.

3.0 How to use the Translator?

1 Select the PCF file(s). Use “shift” key for selecting multiple PCF files. PD2CAEPIPE combines the PCF files in to one stress analysis model, when multiple files are selected.

2 Specify the name of the output file.



3 Select the piping code to be used for the analysis from the list box.

4 Enter the Starting Node number and Node increment value in the appropriate field by selecting the option “Rearrange Node Numbers”. By default, the Starting Node number and Node increment are set to 10 and 10 respectively.

5 Enter the Specific Gravity of fluid with respect to water. By default the specific gravity is set to 1.0.

6 Select Default Hanger to be transferred to CAEPIPE. This selected Hanger type will be used in CAEPIPE, only when the hanger type is not specified in Plant Design software at hanger locations. For details on transferring support from Plant Design to CAEPIPE, refer **Appendix D** of PD2CAEPIPE User's manual (PD2CAEPIPE.pdf).

7 Specify the Starting Node number for processing network. This is set to 10 by default. If the user is not sure about the node number, then this can be left as 10 or enter as 0.

8 If the user wishes to eliminate those elements whose Nominal size (NS) is less than 50mm / 2in, then they can specify the value as "50/2" in the field "Process elements, if dia >". In other words, the program will process only those elements whose nominal size is greater than the value specified in the field above.

9 Specify how the Flange to be transferred to CAEPIPE.

10 Specify how the 3 Way and 4 Way Valves are to be transferred to CAEPIPE.

11 Choose the Global Vertical Axis for CAEPIPE from the Vertical Direction option. By default, "Z Axis" shall be taken as Global Vertical Axis.

12 Press the button "Run" to generate the .mbf file for CAEPIPE.

Reference

Units

Piping system from PCF will be transferred to CAEPIPE in SI units when the field "UNITS-BORE" is set to "MM". Otherwise, the piping system will be transferred to CAEPIPE in ENGLISH units.

Loads

Temperature for the piping system is read from "PIPELINE-TEMP" attribute of Pipeline Header information (PIPELINE-REFERENCE attribute) in PCF and will be transferred to CAEPIPE, if available. If not available in PCF, then the Temperature for the piping system will be transferred as 21 deg C / 70 deg F for SI / English units respectively.

Pressure for the piping system is not available in PCF and hence the same will be transferred as 0 to CAEPIPE.

Fluid Density

Specific Gravity of the fluid (with respect to water) entered in the Translator Dialog as shown above will be used by CAEPIPE for calculating the fluid weight in the piping system.

Weight

The weights of Valves, Instruments, Flanges, etc. are read from “WEIGHT” attribute of component data from PCF and will be transferred to CAEPIPE, if available. If not available, then the weight will be transferred as 0.0 to CAEPIPE.

Wall Thickness

Wall thicknesses of the Piping components are not available in PCF for different components. Hence, a Mapping DB is configured outside PCF to transfer the Wall Thickness information to CAEPIPE properly. Refer **Appendix C** of PD2CAEPIPE User’s Manual (PD2CAEPIPE.pdf) for details.

OD and Nominal Size

Nominal size of a component is read from END_POINT attribute of PCF. OD of the piping component is not available in PCF. Hence, OD corresponding to component Nominal size is extracted from the Mapping DB configured outside PCF to transfer the same to CAEPIPE. Refer Appendix C of PD2CAEPIPE User’s Manual (PD2CAEPIPE.pdf) for details.

Boundary Conditions

The present version of the CAEPIPE (for PCF) will “Anchor” all the free ends irrespective of whether they are connected to Equipment Nozzle or other Pipelines as the details of pipeline connections are not available in PCF file at this time.

Supports

Support details including their locations will be transferred to CAEPIPE as follows.

- Checks for attribute “SUPPORT” in PCF.
- If the attribute “SUPPORT” is defined in PCF, then reads the attribute “CO-ORDS” to locate the support in the specified coordinate.
- Reads the support type information from the attribute “SKEY” (if available) and generates the equivalent support type in CAEPIPE by reading the Mapping DB (SupportType.mdb available with the product) when the option “Transfer Support using MDB” is selected from the dialog shown above. User can also customize and transfer support information along with stiffnesses, gap and friction by selecting the option “Transfer Support without using MDB”. Refer **Appendix D** of PD2CAEPIPE User’s Manual for details.
- If the attribute “SKEY” is not defined / available, then the support type will be transferred as “Hanger” with Hanger Type as specified in “Default Hanger to be used” option.

Material

Material description entered at attribute “ITEM-CODE” will be read and the material property is then obtained from the intermediate mapping db. The material property thus obtained will be transferred to CAEPIPE. Refer **Appendix B** of PD2CAEPIPE User’s Manual for details.

Thermal Anchor Movement (TAM)

Thermal Anchor Movement (TAM) values entered at attribute “ATTRIBUTE1” under “END-CONNECTION-EQUIPMENT” of PCF file in the format “X Y Z” in global X, Y and Z directions respectively will be transferred to CAEPIPE if available. These values should be defined in “mm” for SI units and in “Inch” for English units.

User defined Equipment Nozzle Allowable Loads

Equipment Nozzle Allowable Loads (forces and moments) provided by the equipment manufacturer or calculated using Applicable codes / Finite Element Methods entered at attribute “ATTRIBUTE2” under “END-CONNECTION-EQUIPMENT” of PCF file in the format FX, FY, FZ, MX, MY and MZ will be transferred to CAEPIPE. These values should be separated using a BLANK space. Please note, the force values should be entered in “lb” for English units and in “N” for SI units. Similarly, the moment values should be entered in “ft-lb” for English units and in “Nm” for SI units.

PCF to CAEPIPE component Mapping

The types of components available in PCF are simulated as tabulated below in CAEPIPE.

Component identifier in PCF	Component in CAEPIPE
PIPE	Pipe
GASKET	Pipe
UNION	Pipe
CONNECTOR	Rigid Element
CAP	Rigid Element
FILTER	Rigid Element
INSTRUMENT	Rigid Element
INSTRUMENT with SKEY “BELW”**	Bellow**
INSTRUMENT-ANGLE	Rigid Element
MISC-COMPONENT	Rigid Element

Component identifier in PCF	Component in CAEPIPE
MISC-COMPONENT-ANGLE	Rigid Element
MISC-HYGENIC	Rigid Element
SAFETY-DISC	Rigid Element
TRAP	Rigid Element
TRAP-ANGLE	Rigid Element
VALVE-ANGLE	Rigid Element
REDUCER-CONCENTRIC	Reducer
COUPLING	Reducer
REDUCER-ECCENTRIC	Reducer
FILTER-OFFSET	Reducer
INSTRUMENT-OFFSET	Reducer
MISC-COMPONENT-OFFSET	Reducer
TRAP-OFFSET	Reducer
CROSS	Four Rigid Elements or Four Pipes with Concentrated Mass
VALVE-3WAY	Three Rigid Elements or Three Pipes with Concentrated Mass
INSTRUMENT-3WAY	Three Rigid Elements or Three Pipes with Concentrated Mass
VALVE-4WAY	Four Rigid Elements or Four Pipes with Concentrated Mass
INSTRUMENT-4WAY	Four Rigid Elements or Four Pipes with Concentrated Mass
SUPPORT	HANGER (by default)
FLANGE	Flange

Component identifier in PCF	Component in CAEPIPE
LAPJOINT-RING	Flange
LAPJOINT-STUBEND	Flange
TEE	Pipe(s) with Branch SIF (Welding TEE) or (Weldolet)
ELBO-TEED	Pipe(s) with Branch SIF (Welding TEE) or (Weldolet)
INSTRUMENT-TEE	Pipe(s) with Branch SIF (Welding TEE) or (Weldolet)
REDUCER-CONCENTRIC-TEED	Pipe(s) with Branch SIF (Welding TEE) or (Weldolet)
Y-PIECE-FITTING	Pipe(s) with Branch SIF (Welding TEE) or (Weldolet)
ELBOW	Bend
FILTER-ANGLE	Bend

** Available and valid for PCF-to-CAEPIPE, CATIA to CAEPIPE, AutoPlant to CAEPIPE Versions 9.30 or later, checkSTRESS PCF, checkSTRESS II PCF, checkSTRESS Nuke PCF Version 9.40 or later, CAEPIPE 3D+ for PCF Version 10.50 or later.