



AD FALCON API Manual

Analysis Properties

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1 Analysis Properties

1.1 Analysis Type

The % AnalysisType section specifies the type of analysis to be performed. The analysis type defines the dimensionality and coupling characteristics of the simulation.

1.2 Syntax

1.2.1 Section Format

```
% AnalysisType
<analysis_type_string>
%%%
```

1.2.2 Syntax Rules

1. **Section Header:** The section header % AnalysisType is parsed **case-insensitively**. Whitespace, underscores, and hyphens are normalized. The following are all equivalent:

- % AnalysisType
- %AnalysisType
- % analysistype
- % ANALYSISTYPE
- % Analysis-Type
- % Analysis_Type

2. **Analysis Type String:**

- Leading and trailing whitespace is automatically trimmed
- Case-insensitive matching is performed
- Must match one of the valid analysis types listed below

3. **Valid Analysis Types** (case-insensitive):

- **Plane Strain:** PLNonCoupled, PLUnCoupled, PLCoupled, PLFullyCoupled
- **Axisymmetric:** AXNonCoupled, AXUnCoupled, AXCoupled, AXFullyCoupled
- **3D:** ThreeDNonCoupled, ThreeDUnCoupled, ThreeDCoupled, ThreeDFullyCoupled

4. **Comments:** Inline comments using # are supported:

```
% AnalysisType # Select analysis type
PLCoupled
```

```
%%%
```

5. **Section Delimiter:** The section ends with `%%%` or when the next `%` section marker is encountered.

1.2.3 Multiple definitions

- Provide exactly one analysis-type string inside `% AnalysisType`.
- Do not define multiple `% AnalysisType` sections in the same input file.

1.2.4 Supported Analysis Types:

Plane Strain (PL)

- **PLNonCoupled** or **PLUnCoupled:** Plane-strain, uncoupled (solid only)
- **PLCoupled:** Plane-strain, coupled (solid + water)
- **PLFullyCoupled:** Plane-strain, fully coupled (solid + water + air)

Axisymmetric (AX)

- **AXNonCoupled** or **AXUnCoupled:** Axisymmetric, uncoupled (solid only)
- **AXCoupled:** Axisymmetric, coupled (solid + water)
- **AXFullyCoupled:** Axisymmetric, fully coupled (solid + water + air)

3D

- **ThreeDNonCoupled** or **ThreeDUnCoupled:** 3D, uncoupled (solid only)
- **ThreeDCoupled:** 3D, coupled (solid + water)
- **ThreeDFullyCoupled:** 3D, fully coupled (solid + water + air)

Note: This manual primarily covers plane-strain and axisymmetric analyses. 3D capabilities are available but not extensively documented here.

1.2.5 Example:

```
% AnalysisType
PLCoupled
%%%
```

```
% AnalysisType
AXNonCoupled
%%%
```