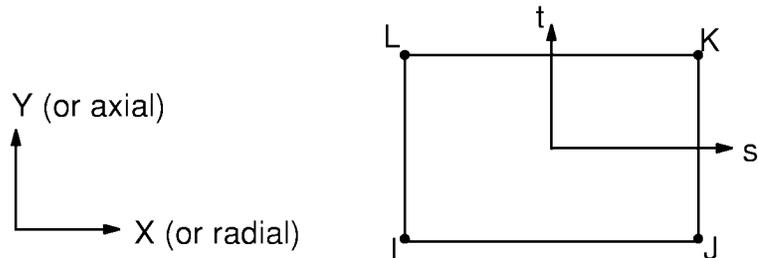


14.81 FLUID81 — Axisymmetric–Harmonic Contained Fluid



Matrix or Vector	Geometry	Shape Functions	Integration Points
Stiffness Matrix	Quad	Equations (12.7.5–1), (12.7.5–2), and (12.7.5–3)	1 for bulk strain effects and 2 x 2 for shear and rotational resistance effects
	Triangle	Equations (12.7.1–1), (12.7.1–2), and (12.7.1–3)	1 for bulk strain effects and 3 for shear and rotational resistance effects
Mass Matrix	Quad	Equations (12.6.5–1), (12.6.5–2), and (12.6.5–3)	2 x 2
	Triangle	Equations (12.6.1–1), (12.6.1–2), and (12.6.1–3)	3
Damping Matrix	Same as stiffness matrix		Same as stiffness matrix
Temperature Load Vector	Same as stiffness matrix		Same as stiffness matrix
Pressure Load Vector	Same as stiffness matrix, specialized to the face		2

LOAD TYPE	DISTRIBUTION
Element Temperature	Average of the four nodal temperatures is used throughout the element
Nodal Temperature	Same as element temperature distribution
Pressure	Linear along each face

14.81.1 Other Applicable Sections

Chapter 2 describes the derivation of element matrices and load vectors. The fluid aspects of this element are the same as described for FLUID80 (Section 14.80) except that a consistent mass matrix is also available (**LUMPM,OFF**). Section 13.1 describes integration point locations.

14.81.2 Assumptions and Restrictions

The material properties are assumed to be constant around the entire circumference, regardless of temperature dependent material properties or loading.

14.81.3 Load Vector Correction

When **MODE** equals 1 or greater (input on **MODE** command), the gravity that is required to be input for use as a gravity spring (input as **ACELY** on **ACEL** command) also is erroneously multiplied by the mass matrix for a gravity force effect. This erroneous effect is cancelled out by an element load vector that is automatically generated during the element stiffness pass.