14.89 VISCO89 —20–Node Viscoelastic Solid
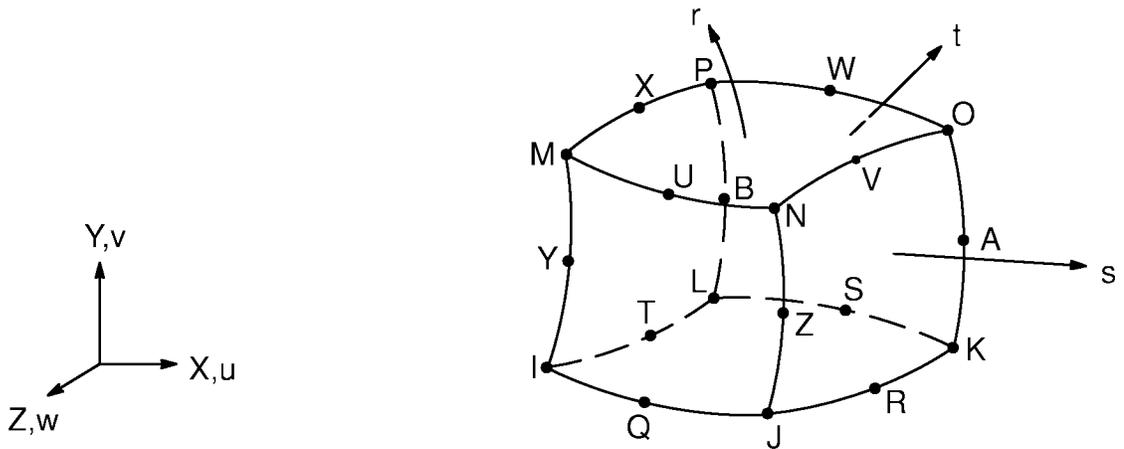
Matrix or Vector	Geometry	Shape Functions	Integration Points
Stiffness Matrix	Brick	Equations (12.8.20–1), (12.8.20–2), and (12.8.20–3)	14
	Wedge	Equations (12.8.14–1), (12.8.14–2), and (12.8.14–3)	3 x 3
	Pyramid	Equations (12.8.7–1), (12.8.7–2), and (12.8.7–3)	2 x 2 x 2
	Tet	Equations (12.8.2–1), (12.8.2–2), and (12.8.2–3)	4
Mass Matrix	Same as stiffness matrix.		Same as stiffness matrix
Stress Stiffness Matrix	Same as stiffness matrix		Same as stiffness matrix

Matrix or Vector	Geometry	Shape Functions	Integration Points
Thermal and Newton–Raphson Load Vector	Same as stiffness matrix		Same as stiffness matrix
Pressure Load Vector	Quad	Equations (12.5.10–1) and (12.5.10–2)	3 x 3
	Triangle	Equations (12.5.2–1) and (12.5.2–2)	6

Load Type	Distribution
Element Temperature	Same as shape functions across element
Nodal Temperature	Same as shape functions across element
Pressure	Bilinear across each face

References: Zienkiewicz(39), Markovsky et al.(108), Scherer and Rekhson(109), Narayanaswamy(110), Zienkiewicz et al.(111), Taylor et al.(112)

14.89.1   Other Applicable Sections

Section 4.6 describes the basic theory regarding viscoelasticity and Section 13.1 describes integration point locations. If KEYOPT(3) = 1, the matrix is diagonalized as described in Section 13.2.