LRFD Format Conversion Factors for Trus Joist® TJI® Joists

ASTM D5457-19c gives the following relationships shown in Table 1 for LRFD format conversion factors.

TABLE 1: EQUATIONS FOR DETERMIING FORMAT CONVERSION FACTOR

Application	Property	K_F
Member	F_b, F_t, F_v, F_c and other properties subject to load duration adjustment	$2.16/\varphi$
	E_{min}, $F_{c\perp}$, and other properties NOT subject to load duration adjustments	$1.50/\varphi$
Connections	All design values	$2.16/\varphi$

2018 NDS® Section 7.3.8 places the responsibility for determination of the format conversion factor (K_F) on the I-joist manufacturer and specifies the φ factors for design of I-joists. φ factors for TJI® joists are shown in Table 2.

TABLE 2: PHI FACTORS ESTABLISHED BY NDS®

Property	φ
Moment, M	0.85
Shear, V	0.75
Reaction, R	0.75
Stiffness, EI	1.00
Buckling Stiffness, EI_{min}	0.85
Shear Stiffness Coefficient, K	1.00

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The appropriate K_F factor is dependent on whether the property is subject to the load duration adjustment. TJI® design values are subject to load duration adjustment for moment, shear, and reaction. Thus, the equation $K_F = 2.16/\varphi$ is applicable. For both flexure and shear stiffness, the format conversion factor is simply 1.00. Weyerhaeuser does not publish design values for buckling stiffness, so the format conversion factor does not apply for that property. The K_F factors for use with TJI® joists are summarized in Table 3 below.

TABLE 3: K_F FACTORS FOR USE WITH TJI® JOISTS

Application	Equation (K_F=...)	φ	K_F
Moment, M	$2.16/\varphi$	0.85	2.54
Shear, V	$2.16/\varphi$	0.75	2.88
Reaction, R	$2.16/\varphi$	0.75	2.88
Stiffness, EI	1.00	1.00	1.00
Buckling Stiffness, EI_{min}	-	0.85	-
Shear Stiffness Coefficient, K	1.00	1.00	1.00

If you have any questions, please contact your Weyerhaeuser representative.

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