BALDOR · DODGE

Baldor•Dodge Raptor: Temperature Ranges and Adjustment Factors

C.O. Engineering - Bearings and PT Components
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The Baldor•Dodge Raptor features a patented, finite element optimized, winged elastomeric element design. There are two different types of elements offered with the Raptor coupling; standard and armored. Both are manufactured from natural rubber. When selecting a Raptor coupling, it is important to consider the operating temperature of the application to ensure performance is not compromised.

Competitive urethane designs include a temperature adjustment factor in the application service factor recommendation based on applications that typically see higher temperatures. However, simply because an application typically see higher temperatures does not mean that is always the case. Additionally, these applications are not identified in any way so it is difficult to determine which ones already include the adjustment factor. This could lead to users potentially oversizing coupling selections based on temperature. Oversizing couplings can lead to increased cost and could potentially damage connected equipment in the event of an overload. To prevent oversizing a coupling during selection, these adjustment factors have not been included in the standard Raptor application service factor. Instead, a separate temperature adjustment factor is used when calculating the total system service factor.

The operating temperature range for both the Standard Element and Armored Element is -45°F to 220°F (-42.8°C to 104.4°C). If the coupling will be running in an environment with an ambient temperature over 180°F (82.2°C), a high temperature adjustment factor must be included in the total system service factor. The high temperature adjustment factors can be found in Table 1. The adjustment factor should be added to the application service factor and driver service factor to obtain the system service factor, see equation 1.

System S.F. = Application S.F. + Driver S.F. Adder + High Temperature Adjustment Factor (Eq. 1)

Temperature Range	Adjustment Factor
-45°F to 179°F (-42.8°C to 81.7°C)	+0
180°F to 200°F (82.2°C to 93.3°C)	+ 0.75
201°F to 220°F (93.9°C to 104.4°C)	+ 1.0

Table 1. Temperature range adjustment factors

The following example demonstrates a system service factor calculation for a high temperature application.

Example

Application: Steel Mill Rollout Table (non-reversing) and Electric Motor (standard torque)

Max Operating Temperature: 185°F (85°C)

Step 1. Obtain required application service factor from the Service Factor Tables in the Raptor catalog/brochure, see Table 1.

TABLE 1: STEEL MILL ROLLOUT SERVICE FACTOR FOUND IN CATALOG SERVICE FACTOR TABLE

	Factor Δ
Application (Read Footnotes)	**Raptor**
STEEL INDUSTRY	
Cold Mills	
Coiler up or down	1.50
Strip, Temper	2.00
Hot Mills	
Coiler up or down	1.50
Edger Drive	1.50
Feed Roll Blooming	3.00
Roughing Mill Delivery	3.00
Non-reversing, Sheet Strip	3.00
Rod Mill	2.50
Soaking Pit Cover Drive Lift	3.00
Soaking Pit Cover Drive Travel	3.00
Rollout Table (non-reversing)	2.0
Rollout Table (reversing)	3.5

Step 2. Obtain required application driver service factor adder from the Service Factor Tables in the Raptor catalog/brochure, see Table 2.

TABLE 2. DRIVER SERVICE FACTOR ADDER FOUND IN CATALOG SERVICE FACTOR TABLE

Type of Coupling	Electric Motor Std. Torque	High Torque Motors	Turbines	Reciprocating Engine Number of Cylinders				
				12 or More	8 to 11	6 to 7	4 to 5	Less than 4
Raptor	0.00	0.00	0.00	0.00	0.50	0.50	0.50	♦

Step 3. Determine the High Temperature Adjustment Factor from the temperature adjustment factor table in the Raptor catalog/brochure**Error! Reference source not found.**, see Table 3.

TABLE 3. HIGH TEMPERATURE ADJUSTMENT FACTORS

Temperature Range	Adjustment
-45°F to 179°F (-42.8°C to 81.7°C)	+0
180°F to 200°F (82.2°C to 93.3°C)	+ 0.75
201°F to 220°F (93.9°C to 104.4°C)	+ 1.0

Step 4. Calculate the system service factor

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System S.F. = Application S.F. + Driver S.F. Adder + High Temperature Adjustment Factor

2.0 + 0.0 + 0.75 = 2.75

By separating the high temperature adjustment factor from the application service factor, we are able to reduce the possibility of accidentally selecting an oversized coupling while still accounting for effects of operating temperature.

For additional information or questions related to the Baldor•Dodge Raptor Coupling or other power transmission components, please contact Customer Order (C.O.) Engineering. Contact information for Baldor C.O. Engineering may be found on the Baldor Engineering Support webpage at http://www.baldor.com/brands/baldor-dodge/product-support/dodge-engineering-support.