

# EMPEROR<sup>®</sup> CABLE CLEAT LINEAL SPACING GUIDELINES

## IEC 61914:2009, §6.4.4 Resistance to Electromechanical Forces (Withstanding more than One Short Circuit)

MAXIMUM CABLE CLEAT LINEAL SPACING					
CABLE TYPE	CRITERIA	CONFIGURATION	HORIZONTAL	VERTICAL	BENDS
Single-Core	Short Circuit Withstand ( $I_{PEAK} \leq 2.2 * I_{RMS}$ )	Single (1/C) Dual (2x1/C) Trefoil/ Triplex (3x1/C) Quad (4x1/C)	225mm - 900mm (9" - 36") SEE TABLE 1		NOTE 7
Notes:	<p>1. The information contained herein is subject to interpretation by a registered professional engineer and is intended as a general guideline to be verified by engineering calculation and independent 3rd party short circuit test certification in accordance with IEC 61914:2009, Cable Cleats for Electrical Installations.</p> <p>2. In addition to the cable support dictated by the applicable codes and standards, cables required to withstand electromechanical short circuit forces shall be restrained with cable cleats according to the maximum lineal spacing guidelines in TABLE-1.</p> <p>3. Consult kVA Strategies for applications utilizing extra-flexible cable stranding (e.g. diesel locomotive cable).</p> <p>4. Cables in cable tray subject to NFPA-70-2008 are also required to be restrained at 1.8m (6' 0") maximum lineal centers.</p> <p>5. Cables subject to ABS Steel Vessel Rules are also required to be restrained at 400mm (16") maximum lineal centers.</p> <p>6. Cables subject to IEEE-45 are also required to be restrained at 2.5m (8' 2") horizontal maximum lineal centers, 610mm (24") vertical maximum lineal centers and 610mm (24") maximum lineal centers in bends.</p> <p>7. Cable cleats are recommended at the beginning, middle and end of each each horizontal and vertical bend.</p>				

TABLE-1, SHORT CIRCUIT WITHSTAND (kA <sub>RMS</sub> )																							
Maximum Cable Cleat Lineal Spacing	Spacing between Conductor Centers																						
	23mm	24mm	25mm	26mm	27mm	28mm	29mm	30mm	31mm	32mm	33mm	34mm	35mm	36mm	37mm	38mm	39mm	40mm	41mm	42mm	43mm	44mm	
225mm (9")	81	83	85	87	88	90	92	93	95	96	98	99	100	102	104	105	106	108	109	110	112	113	
300mm (12")	70	72	74	75	76	78	79	80	82	83	85	86	87	88	90	91	92	93	95	95	97	98	
450mm (18")	58	59	60	61	62	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
600mm (24")	50	51	52	53	54	55	56	57	58	59	60	60	61	62	63	64	65	66	67	67	68	69	
675mm (27")	47	48	49	50	51	52	53	54	55	55	56	57	58	59	60	60	61	62	63	64	65	65	
900mm (36")	40	41	42	43	44	45	46	46	47	48	49	50	50	51	52	52	53	54	55	55	56	56	

# EMPEROR<sup>®</sup> CABLE CLEAT LINEAL SPACING GUIDELINES

## IEC 61914:2009, §6.4.4 Resistance to Electromechanical Forces (Withstanding more than One Short Circuit)

### Examples:

1. What is the maximum cable cleat lineal spacing for 3 x 1/C - 33.5mm OD cables in trefoil formation that are subject to a short circuit of 62kA<sub>RMS</sub>?
  - a. Find the spacing between conductor centers from TABLE-1. For cables in trefoil, the spacing is the same as the cable OD. If the exact spacing is not listed in the table, choose the next smaller listed dimension (in this case 33mm). If the spacing is less than 23mm or more than 44mm, please contact kVA Strategies for guidance.
  - b. Follow the column below the cable spacing to find the value of short circuit current the cables will be carrying. If the exact short circuit value is not listed in the table, choose the next larger value (in this case 69kA<sub>RMS</sub>).
  - c. Follow the row corresponding to 69kA to find the maximum cable cleat lineal spacing (in this case 18").
  - d. Determine if the maximum cable cleat lineal spacing meets the applicable approval agency regulations. For example, if this application was subject to the ABS Steel Vessel Rules, the maximum allowed cable cleat lineal spacing would be 16".
2. What is the maximum cable cleat lineal spacing for 3 x 1/C – 28mm OD cables in flat formation (42mm center to center spacing between cables) that are subject to a short circuit of 62kA<sub>RMS</sub>?
  - a. Find the spacing between conductor centers from TABLE-1 (in this case 42mm). Follow the column below the cable spacing to find the value of short circuit current the cables will be carrying. If the exact short circuit value is not listed in the table, choose the next larger value (in this case 64kA<sub>RMS</sub>).
  - b. Follow the row corresponding to 64kA to find the maximum cable cleat lineal spacing (in this case 27").