1. SCOPE

This standard establishes the requirements for heavy hexagon head flange bolts as defined by EN 1665, “Hexagon Bolts with Flange – Heavy series.” All part numbers contained in this document are classified as ‘non-preferred’ as defined by ENPA110, “Standard Preferred Parts,” and are compliant with EN 1665.

2. CONTENTS

TABLE 1: Heavy Hexagon Flange Bolts General Dimensions
TABLE 2: Heavy Hexagon Flange Bolts, 10.9, ZND
TABLE 3: Heavy Hexagon Flange Bolts

3. RELATED DOCUMENTS

3.1 REFERENCE STANDARDS

DIN 6921—Hexagon Flange Bolts
EN 1665—Hexagon Bolts With Flange – Heavy series
CNH STPA020—Fastener Finishes and Material Specifications
ISO 888—Bolts screws and studs – Nominal lengths and thread lengths for general purpose bolts
ISO 898-1—Mechanical Properties of Fasteners made of Carbon Steel and Alloy Steel
ISO 965-1—ISO General Purpose Metric Screw Threads - Tolerances - Part 1
ISO 6157-3—Fasteners - Surface Discontinuities
ISO 3506-1—Mechanical properties of corrosion-resistant stainless steel fasteners – Part 1
Iveco 18-1103— Zinc-Nickel Electrolytic Coating for Ferrous Metal Parts

3.2 REPLACED STANDARDS

Case BM-041—Heavy Hex Flange Head Bolts Metric Series General Specifications
Case BM-042—Heavy Flange Head Bolts - Heavy Hex - Preferred
Case BM-043—Heavy Hex Flange Head Bolts - Heavy Hex - Non Preferred
Case BM-044—Heavy Hex Flange Head Bolts – Heavy Hex – Special Non-Preferred
FNHA 1-A-050—Screw, Cap, Hex Head, Flange, Class 8.8, ZnCr, Metric
Fiat 10366—Flanged Hex Head Bolts

4. REQUIREMENTS

4.1 DIMENSIONS

Reference EN 1665 for all dimensions not specified in this document. All dimensions in this standard are in millimeters. M5, M6 and M8 Flange Head Bolts can be supplied per DIN 6921

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4.2 MATERIAL

All flange bolts defined in this standard must be manufactured from an ISO Class material. See ISO 898/1, “Mechanical Properties of Fasteners made from Carbon Steel and Alloy Steel”, for details. Certain zinc electroplated and mechanical plated high hardness fasteners have been identified as being highly susceptible to Hydrogen Assisted Cracking (HAC). Use of these fasteners is restricted: they shall not be used in new designs after 01OCT2011.

Stainless Steel Material A4-80 per ISO 3506-1

4.3 FINISH

All flange bolts defined in this standard must be finished using a coating or plating defined in STPA020, “Fastener Finishes and Material Specifications.”

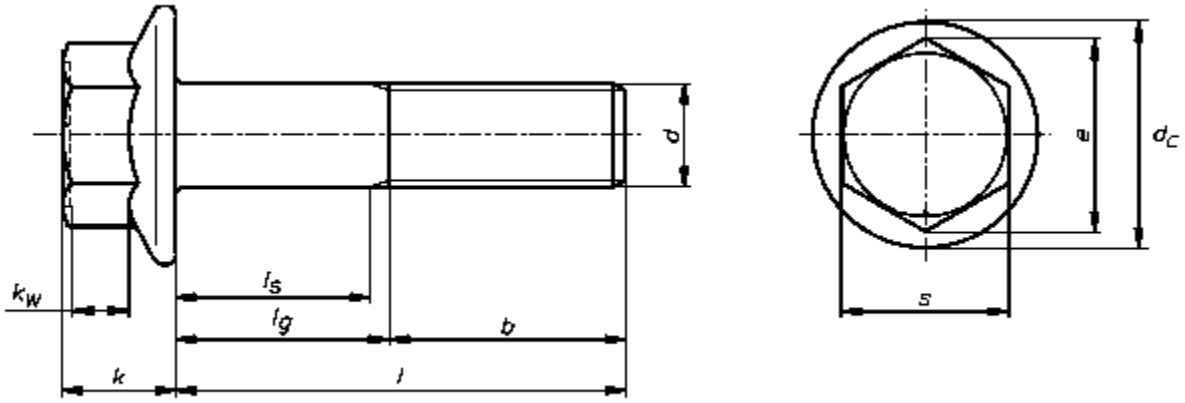
5. CROSS REFERENCE

For cross reference listing of company part numbers, go to PARTsolutions.

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TABLE 1: Heavy Hexagon Flange Bolts General Dimensions



Nominal Diameter		**M5**	**M6**	**M8**	**M10**	**M12**	**M14**	**M16**	**M20**
Pitch		0.8	1	1.25	1.5	1.75	2	2	2.5
d Body diameter	Max	5	6	8	10	12	14	16	20
	Min	4.82	5.82	7.78	9.78	11.73	13.73	15.73	19.67
s Width across flats	Max	**8**	**10**	**13**	**16**	**18**	**21**	**24**	**30**
	Min	7.78	9.78	12.73	15.73	17.73	20.67	23.67	29.67
e Width across corners	Min	8.71	10.95	14.26	17.62	19.86	23.15	26.51	33.23
d_c Flange diameter	Max	11.8	14.2	18.0	22.3	26.6	30.5	35	43
k_w Wrench height	Min	2.0	2.5	3.2	5.1	5.6	6.5	7.3	8.9
k Head height	Max	5.8	6.6	8.1	10.4	11.8	13.7	15.4	18.9
b Nominal thread length	*l* <= 125	16	18	22	26	30	34	38	46
	125 < *l* <= 200			28	32	36	40	44	52
	l > 200							57	65
	Fully threaded *l* <=	20	25	30	35	40	45	50	60

Lengths (*l*): 10, 12, 16, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 180, 200

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TABLE 2: Heavy Hexagon Flange Bolts, 10.9, ZND

Length	M6	M8	M10	M12	M14	M16	M20
12	87698753						
16	87695418	87681207	87021006				
20	87675531	87656137	87698835	87698844			
25	87670758	87698833	87698836	87343550	47579005		
30	87698760	87030775	87698837	87030508	84188437	87698766	
35	87698832	87695419	87698838	87695414			
40	87670759	87698834	87698839	87695413		87495304	47616456
45		84401335	87675532	87672196	51433962	87698746	
50	87670760	87698763	87698840	87670764		87698849	
55		51533316					
60	87698761	87670761	87656139	87301277		87675533	47741895
65	47915382	92122918	84278116	84388498		90337251	
70	90354394	87656138	87698841	87698845		47410091	47506619
80	90354396	87695420	87698842	87698846		87646188	84415414
90	90354397	87670762	87695408	87698847		47616478	
100		87301686	87695415	87032825	16681435	87698850	90337733
110		84193283	87698861	48040537		87015923	
120		86705432	87698843	87698848		87698807	
130		87681208	84379530	87742362		87028051	
135				84606847			
140		87670763	87681213	48061727		87028052	
150			48144003	87030021			
160		91785320		92148074		87698851	
170				84526231		47875492	84246761
180		84326213	87698748	92281010		87015924	
190		90354403		84256800		47626002	
200		90354405		48029837		84224896	

Flange Bolts with lengths shown above the continuous thick line are threaded to head.

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TABLE 3: Heavy Hexagon Flange Bolts

Nominal Diameter	Length	Thread Length	Material	Finish	Part Number
M5	8	FULL	8.8	DAC	92841737
M5	10	FULL	8.8	DAC	48187266
M5	12	FULL	8.8	ZND	86511838
M5	16	FULL	5.8	DAC	16285114
M5	30	16	8.8	ZND	48175873
M6	10	FULL	8.8	PHC	87015907
M6	10	FULL	8.8	BGM	48066952
M6	12	FULL	8.8	BGM	92088454
M6	12	FULL	8.8	DAC	16285924
M6	12	FULL	8.8	BZN	86500925
M6	14	FULL	8.8	BGM	92088216
M6	14	FULL	8.8	DAC	16296924
M6	14	FULL	8.8	ZN-NI-4	92251021
M6	15	FULL	8.8	PHC	87015915
M6	16	FULL	SST	BLO	87310152
M6	16	FULL	8.8	BGM	90347411
M6	16	FULL	8.8	BZN	86624996
M6	16	FULL	8.8	POL	87307790
M6	16	FULL	10.9	ZN-NI-6	92030890
M6	20	FULL	SST	BLO	87310098
M6	20	FULL	A4-80	PLN	91708488
M6	20	FULL	8.8	BGM	90354395
M6	20	FULL	8.8	BZN	86624965
M6	20	FULL	8.8	PHC	87015862
M6	20	FULL	8.8	POL	87303781
M6	20	FULL	8.8	Zn-Ni	90510191
M6	30	18	8.8	PHC	87015863
M6	30	18	10.9	PTF	86639023
M6	35	18	8.8	DAC	16286424
M6	40	18	8.8	BGM	92088455
M6	40	18	8.8	ZN-NI-4	92251023
M6	55	18	8.8	BZN	86500654
M6	60	18	8.8	BGM	90506876
M6	70	18	8.8	BGM	92088453
M6	70	18	8.8	ZN-NI-4	92251022
M6	70	FULL	10.9	ZND	92152399
M6	100	18	8.8	ZND	86001190
M8	12	FULL	8.8	ZND	86512520
M8	12	FULL	8.8	PHC	87015916
M8	16	FULL	8.8	DOR	86981479

Zn-Ni – Zinc Nickel per Iveco 18-1103 Fe/ZnNi 7 IV

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TABLE 3: Heavy Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Material	Finish	Part Number
M8	16	FULL	8.8	PHC	87015864
M8	16	FULL	8.8	BGM	47455733
M8	16	FULL	10.9	BGM	92777612
M8	16	FULL	A2-70	PLN	47565515
M8	18	FULL	A2-70	PLN	47565526
M8	20	FULL	8.8	DOR	86981480
M8	20	FULL	8.8	PHC	87015865
M8	20	FULL	8.8	BGM	47455738
M8	20	FULL	10.9	BGM	91903325
M8	20	FULL	10.9	BZN	91799789
M8	20	FULL	10.9	DOR	87344207
M8	20	FULL	10.9	DAC	16287134
M8	20	FULL	SST	PLN	47556135
M8	25	22	8.8	PLN	47434883
M8	25	FULL	8.8	DOR	86981481
M8	25	FULL	8.8	BZN	51686706
M8	25	FULL	10.9	DAC	16287234
M8	25	FULL	A2-70	PLN	51448935
M8	30	FULL	8.8	DAC	90356979
M8	30	FULL	8.8	DOR	86981482
M8	30	FULL	10.9	PTF	86639271
M8	30	FULL	10.9	BZN	51496091
M8	35	22	8.8	PHC	86624966
M8	35	22	8.8	ZND	87015934
M8	35	FULL	10.9	ZND	84465299
M8	40	22	8.8	DOR	92863026
M8	40	22	8.8	BGM	92765857
M8	40	FULL	8.8	BGM	91769807
M8	40	22	10.9	PHC	86624973
M8	40	22	A2-70	PLN	51448938
M8	45	22	8.8	PHC	87015866
M8	50	22	8.8	BZN	86500655
M8	50	22	8.8	DAC	86287724
M8	50	22	8.8	PHC	87015867
M8	50	22	A2-70	PLN	51448939
M8	65	22	8.8	PHC	86639269
M8	65	22	8.8	ZND	87017615
M8	70	22	8.8	BGM	92046270
M8	70	22	8.8	DOR	86981705

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TABLE 3: Heavy Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Material	Finish	Part Number
M8	70	22	8.8	PHC	86624974
M8	75	22	10.9	PHC	87302313
M8	80	22	8.8	PHC	87015868
M8	90	22	8.8	PHC	87015869
M8	90	22	10.9	BLO	84545652
M8	95	22	8.8	PHC	87015919
M8	95	FULL	10.9	Zn-Ni	90510187
M8	100	FULL	10.9	ZND	91809207
M8	120	22	10.9	DOR	87344205
M8	140	22	8.8	ZND	84292045
M8	150	28	8.8	ZND	86705426
M10	16	FULL	10.9	BGM	91903324
M10	16	FULL	10.9	DOR	87344204
M10	20	FULL	10.9	DOR	87342080
M10	20	FULL	10.9	BGM	90403505
M10	25	FULL	10.9	BGM	90403506
M10	35	FULL	10.9	DAC	90356980
M10	35	FULL	10.9	DOR	87344194
M10	60	26	10.9	DAC	90356981
M10	70	26	8.8	DOR	92889663
M10	80	26	8.8	DOR	92893199
M10	165	32	10.9	ZND	90428779
M10	195	32	10.9	ZND	47677988
M10	200	32	8.8	ZND	84263397
M10	225	30	10.9	ZND	84204177
M10	250	32	10.9	ZND	47677992
M10	310	30	10.9	ZND	84209930
M12	12	FULL	8.8	ZND	87032912
M12	16	FULL	8.8	ZND	87015922
M12	20	FULL	8.8	BZN	92210517
M12	25	FULL	8.8	BZN	87015913
M12	25	FULL	8.8	BGM	47455718
M12	25	FULL	12.9	PHC	84479325
M12	30	FULL	10.9	DOR	87344198
M12	30	FULL	12.9	PHC	47667808
M12	35	FULL	12.9	PHC	84479326
M12	40	FULL	10.9	DAC	90356982
M12	40	30	12.9	DAC	47408991
M12	45	30	10.9	PHC	87018388
M12	50	30	10.9	DOR	87344199

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TABLE 3: Heavy Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Material	Finish	Part Number
M12	50	FULL	10.9	ZND	90470986
M12	65	30	10.9	PHC	87015920
M12	70	FULL	10.9	ZND	90470987
M12	85	30	10.9	ZND	47908270
M12	90	30	12.9	ZND	#84361279
M12	115	30	12.9	DAC	47409002
M12	155	36	10.9	ZND	47908964
M12	200	36	12.9	PHC	90349987
M12X1.25	20	FULL	8.8	BGM	92172989
M12X1.25	60	30	10.9	PHC	47545171
M14	45	34	12.9	ZND	#84361280
M14	45	34	12.9	PHC	84479328
M14	80	34	10.9	DOR	84421928
M16	60	38	10.9	PHC	87015909
M16	60	FULL	10.9	ZND	47411035
M16	80	FULL	10.9	ZND	47411044
*M16	80	38	10.9	ZND	47635472
*M16	90	38	10.9	ZND	47636487
M16	90	38	10.9	DOR	47604816
M16	95	38	10.9	ZND	92207395
M16	100	38	10.9	DOR	47607661
M16	150	44	10.9	ZND	90435389
M20	100	46	8.8	ZND	87690487
M20	100	46	10.9	DOR	84163827
M20	110	46	10.9	DOR	47635980
M20	170	52	10.9	Zn-Ni	90509042
M20	170	52	10.9	BGM	91796035
M20X1.5	50	FULL	8.8	DAC	90399214
M20X1.5	50	FULL	10.9	DAC	91808783
M20X1.5	70	46	10.9	DOR	87035472

* Left Hand Thread

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