



Standard Part

Hexagon Flange Bolts Metric (Non-EN 1665 Compliant)

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1. SCOPE

This standard establishes the requirements for heavy hexagon head flange bolts as defined by DIN 6921, "Hexagon Flange Bolts," All part numbers contained in this document are non-compliant with EN 1665.

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3. RELATED DOCUMENTS

3.1 REFERENCE STANDARDS

DIN 6921—Hexagon Flange Bolts

CNH STPA020—Fastener Finishes and Material Specifications

IFI 524—Industrial Fasteners Institute – Test Procedure for Prevailing Torque Non-Metallic Lock Screws

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 6157-3—Fasteners - Surface Discontinuities

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

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 DIN 6921 for all dimensions not specified in this document. All dimensions in this standard are in millimetres.

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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.

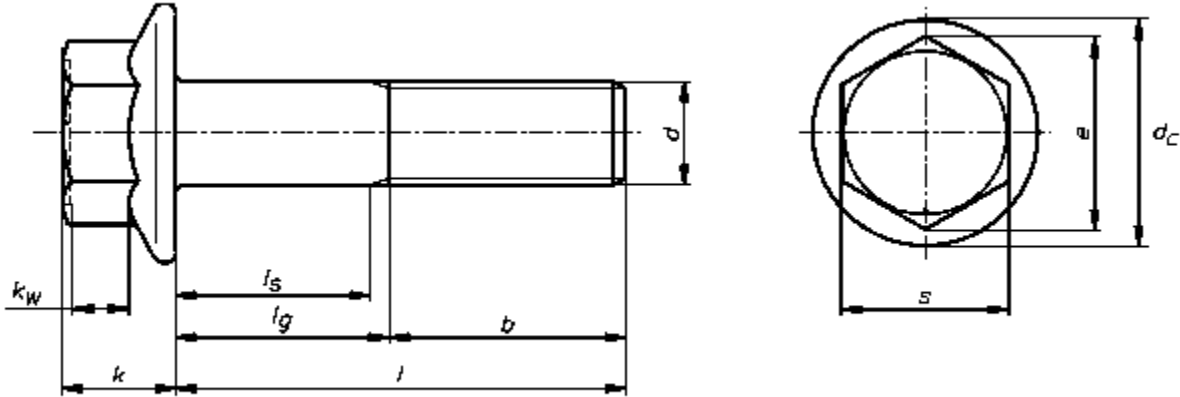
4.3 FINISH

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](#).

TABLE 1: Hexagon Flange Bolts General Dimensions



Nominal Diameter		M10	M12	M14	M16	M20
Default Coarse Pitch		1.5	1.75	2	2	2.5
Fine Pitch		1.25	1.5	1.5	1.5	1.5
Extra Fine Pitch		1	1.25	-	-	-
<i>d</i> Body diameter	Max	10	12	14	16	20
	Min	9.78	11.73	13.73	15.73	19.67
<i>s</i> Width across flats	Max	15	16	18	21 & 24	27
	Min	14.73	15.73	17.73	20.67	26.67
<i>e</i> Width across corners	Min	16.5	17.62	19.86	23.15	29.87
<i>dc</i> Flange diameter	Max	22.3	26.6	30.5	35	43
<i>kw</i> Wrench height	Min	3.6	4.6	5.1	5.8	6.8
<i>k</i> Head height	Max	9.2	11.5	12.8	14.4	17.1
<i>b</i> Nominal thread length	<i>l</i> ≤ 125	26	30	34	38	46
	125 < <i>l</i> ≤ 200	32	36	40	44	52
	<i>l</i> > 200			53	57	65
	Fully threaded <i>l</i> ≤	35	40	45	50	60



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TABLE 2: Hexagon Flange Bolts

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M8	20	FULL	13	8.8	DAC	2852234
M10	12	FULL	15	8.8	BGM	91903294
M10	12	FULL	15	8.8	ZND	86509558
M10	14	FULL	15	8.8	BGM	90426311
M10	15	FULL	15	8.8	ZND	87646158
M10	15	FULL	15	8.8	BGM	47455756
M10	16	FULL	15	8.8	ZND	86531147
M10	16	FULL	15	10.9	BZN	86508050
M10	20	FULL	15	8.8	BGM	90403495
M10	20	FULL	15	8.8	BZN	87015911
M10	20	FULL	15	8.8	DAC	16587024
M10	20	FULL	15	8.8	DOR	48112328
M10	20	FULL	15	8.8	ZND	86050286
M10	20	FULL	15	10.9	DOR	86981483
M10	20	FULL	15	10.9	ZND	86705428
M10	20	FULL	15	10.9	PHC	87015870
M10	20	FULL	15	SST	PLN	47692007
M10	25	FULL	15	8.8	BZN	87015912
M10	25	FULL	15	8.8	ZND	9804261
M10	25	FULL	15	8.8	DAC	16587124
M10	25	FULL	15	8.8	BGM	47455758
M10	25	FULL	15	8.8	Zn-Ni	90510381
M10	25	FULL	15	10.9	ZND	86705429
M10	25	FULL	15	10.9	DAC	90358083
M10	25	FULL	15	10.9	DOR	86981484
M10	25	FULL	15	10.9	PHC	87015905
M10	25	FULL	15	SST	PLN	47687751
M10	30	FULL	15	8.8	BZN	87015914
M10	30	FULL	15	8.8	ZND	9804262
M10	30	FULL	15	10.9	DOR	86981485
M10	30	FULL	15	10.9	PHC	87778358
M10	35	FULL	15	8.8	ZND	86511845
M10	35	FULL	15	8.8	DAC	90358089
M10	35	FULL	15	8.8	BGM	47455759
M10	35	FULL	15	10.9	BGM	91903295
M10	35	FULL	15	10.9	DAC	90358091
M10	35	FULL	15	10.9	PHC	87015906
M10	35	FULL	15	10.9	ZND	87564735
M10	40	26	15	8.8	ZND	9804263
M10	40	26	15	8.8	DAC	90358149
M10	40	26	15	10.9	DOR	87032337

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

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TABLE 2: Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M10	40	26	15	10.9	ZND	87646157
M10	40	FULL	15	10.9	ZND	48136693
M10	50	FULL	15	10.9	ZND	47650283
M10	50	26	15	8.8	ZND	9804264
M10	50	26	15	8.8	BGM	47455764
M10	50	26	15	10.9	PHC	87522185
M10	55	26	15	10.9	DOR	86981706
M10	60	26	15	8.8	ZND	9804265
M10	70	26	15	8.8	ZND	86011090
M10	75	26	15	10.9	ZND	87015921
M10	75	26	15	10.9	PHC	86624961
M10	90	26	15	10.9	ZND	87681204
M10	80	26	15	8.8	ZND	86507311
M10	100	26	15	8.8	ZND	86547487
M10	100	26	15	10.9	ZND	91759539
M10	105	26	15	8.8	ZND	47711884
M10	110	26	15	8.8	ZND	86624958
M10	120	26	15	8.8	DAC	16599024
M10	120	26	15	10.9	ZND	87681205
M10X1.25	20	FULL	15	8.8	DAC	16288324
M10X1.25	30	FULL	15	8.8	DAC	16288524
M10X1.25	30	FULL	15	8.8	BGM	90506851
M10X1.25	30	FULL	15	10.9	DAC	47715969
M10X1.25	30	FULL	15	12.9	DAC	47723545
M10X1.25	35	FULL	15	8.8	DAC	16288624
M10X1.25	35	FULL	15	8.8	BGM	90400382
M10X1.25	40	26	15	8.8	DAC	16288724
M10X1.25	45	26	15	8.8	DAC	16288824
M10X1.25	50	26	15	10.9	DAC	16288934
M10X1.25	70	26	15	8.8	DAC	16289324
M10X1.25	80	26	15	8.8	BGM	90506864
M10X1.25	80	26	15	8.8	DAC	90467415
M12	20	FULL	16	8.8	ZND	86977727
M12	25	FULL	16	10.9	BGM	91903297
M12	25	FULL	16	10.9	PHC	86624962
M12	25	FULL	16	10.9	DOR	86981486
M12	30	FULL	16	8.8	ZND	9670066
M12	30	FULL	16	10.9	DOR	86981707
M12	35	FULL	16	8.8	ZND	9670288
M12	35	FULL	16	10.9	DOR	86981487
M12	35	FULL	16	10.9	ZND	86705430
M12	40	FULL	16	8.8	ZND	9804268

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TABLE 2: Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M12	40	FULL	16	10.9	ZND	86705431
M12	40	FULL	16	10.9	PHC	86978779
M12	40	FULL	16	10.9	DOR	86981708
M12	50	30	16	8.8	ZND	9671487
M12	50	30	16	10.9	DOR	86981678
M12	50	30	16	10.9	PHC	86642458
M12	55	30	16	8.8	ZND	86508454
M12	55	30	16	10.9	PHC	86637640
M12	60	30	16	8.8	ZND	9804270
M12	60	30	16	10.9	DOR	84539441
M12	65	30	16	8.8	ZND	86509603
M12	75	30	16	8.8	BGM	91903296
M12	75	30	16	8.8	ZND	86509604
M12	80	30	16	8.8	ZND	86508494
M12	85	30	16	8.8	ZND	86509605
M12	130	36	16	8.8	ZND	86505749
M12	140	36	16	8.8	ZND	86561786
M12	150	36	16	8.8	ZND	86639267
M12	150	36	16	10.9	PHC	86634190
M12	150	36	16	10.9	PTF	86837480
M12X1.25	50	30	16	8.8	BGM	92723104
M12X1.25	50	30	16	10.9	DAC	92126288
M12X1.25	55	30	16	10.9	DAC	92126289
M14	35	FULL	18	8.8	ZND	47427859
M14	35	FULL	18	10.9	BGM	91903290
M14	35	FULL	18	10.9	ZND	47456191
M14X1.5	35	FULL	18	10.9	BGM	92696876
M14X1.5	40	FULL	18	10.9	BGM	92752607
M14X1.5	50	34	18	8.8	ZND	51615907
M14X1.5	60	34	18	10.9	ZND	51454731
M16	30	FULL	21	8.8	ZND	86511846
M16	35	FULL	21	8.8	ZND	47427860
M16	35	FULL	21	10.9	ZND	47456193
M16	40	FULL	21	8.8	BGM	91903298
M16	40	FULL	21	8.8	ZND	9804271
M16	40	FULL	21	10.9	PHC	86705427
M16	40	FULL	21	10.9	ZND	86978772
M16	50	FULL	21	8.8	ZND	9804272
M16	50	FULL	21	10.9	DOR	86981488
M16	50	FULL	21	10.9	PHC	86631181
M16	60	38	21	8.8	ZND	9804273
M16	70	38	24	10.9	DOR	86981489



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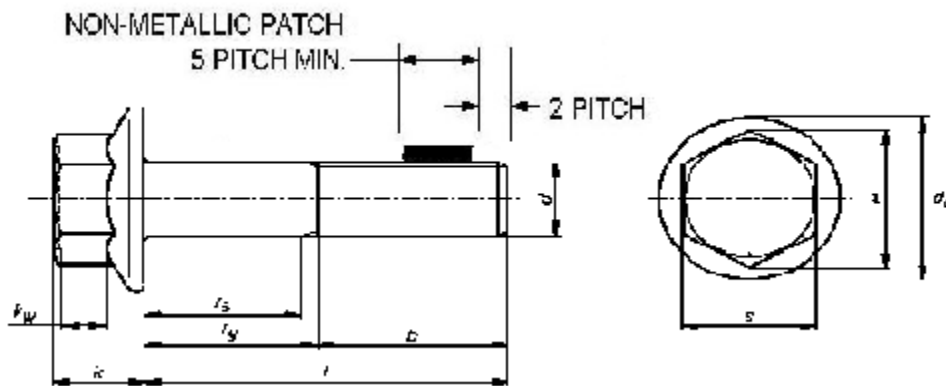
TABLE 2: Hexagon Flange Bolts (Continued)

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M16	70	38	21	10.9	ZND	86013354
M16	80	38	21	8.8	ZND	9804274
M16	80	38	21	10.9	DOR	86981709
M16	90	38	21	8.8	ZND	86511847
M16	90	38	21	10.9	DOR	86981490
M16	100	38	21	8.8	ZND	9804275
M16	130	44	21	8.8	ZND	86511848
M16	200	44	21	8.8	ZND	86511849
M16	200	44	21	10.9	ZND	84377841
M16	210	57	24	10.9	ZND	84238749
M16	210	57	21	10.9	ZND	87028053
M16	220	57	21	8.8	ZND	86511850
M16	225	57	24	10.9	ZND	84224897
M16	240	57	24	10.9	ZND	84492993
M16	250	57	24	10.9	ZND	90428288
M16	260	57	21	8.8	ZND	86511851
M16	280	57	24	10.9	ZND	90507902
M16	285	57	24	10.9	ZND	90507903
M20X1.5	45	FULL	27	12.9	DAC	47673934
M20X1.5	50	FULL	27	12.9	DAC	47662614
M20	50	FULL	27	8.8	ZND	86511852
M20	50	FULL	27	10.9	ZND	51431685
M20	60	FULL	27	8.8	ZND	86511853
M20	60	FULL	27	10.9	BLO	51531374
M20	60	FULL	27	10.9	DOR	86981491
M20	60	FULL	27	10.9	PHC	86631179
M20	60	FULL	27	10.9	ZND	51586901
M20	70	46	27	8.8	ZND	86511854
M20	75	46	27	10.9	DAC	47615794
M20	90	46	27	8.8	ZND	80044027
M20	160	52	27	10.9	ZND	91785319
M20	180	52	27	10.9	ZND	91760867
M20	200	52	27	10.9	ZND	47477420
M20	220	65	27	10.9	ZND	91785714

TABLE 3: Hex Flange Head Prevailing Torque Bolts With Non-Metallic Patch per IFI 524. Thread Diameters M6 to M36 Inclusive.

Prevailing torque bolts with non-metallic patch shall conform to IFI 524 standard. IFI 524 states non-metallic locking element type prevailing-torque lock screws are metallic screws to which have been added a non-metallic insert or fused non-metallic substance in their threaded length. These bolts are for applications where temperatures will not exceed 120°C (250°F).

Bolts shall assemble one full turn by hand. The prevailing torque of bolts shall not exceed the maximum value specified, or be less than the minimum value specified for any installation or removal. Art listed below is for referenced purposes only concerning patch.



Nominal Diameter	Clamp Load 10.9 Bolt kN	Prevailing Torque		
		First Installation	First Removal	Fifth Removal
		Nm Max	Nm Min	Nm Min
M6	12	3	0.45	0.30
M8	23	10	0.9	0.58
M10	36	14	1.8	1.1
M12	52	21	2.6	1.5
M16	98	40	5	3.4
M20	150	60	8	5.5
M24	220	90	13	8.5
M30	350	120	19	13
M36	510	150	28	18

TABLE 4: Hexagon Flange Bolts with Non-Metallic Patch per IFI 524

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M10	25	FULL	15	10.9	ZND	84465305
M10	30	FULL	15	10.9	ZND	51529704
M10	35	FULL	15	10.9	ZND	84465306
M10	70	26	15	10.9	ZND	47587850
M10	80	26	15	10.9	ZND	47587869

TABLE 5: Hex Flange Head Locking Bolts With Chemical Coating per IFI 525. Thread Diameters M6 to M20 Inclusive.

Locking bolts with chemical coating shall conform to IFI 525 standard. These bolts are for applications where temperatures will not exceed 105°C (220°F).

Approved chemical coating: ND Microspheres 593S (Blue) or Precote 85

Bolts shall assemble one full turn by hand. The prevailing torque of lock bolts occurring during the first installation shall not exceed the prevailing torque specified. In addition, the break-away torque and the maximum prevailing off torque occurring during the first removal shall not be less than the minimum values specified.

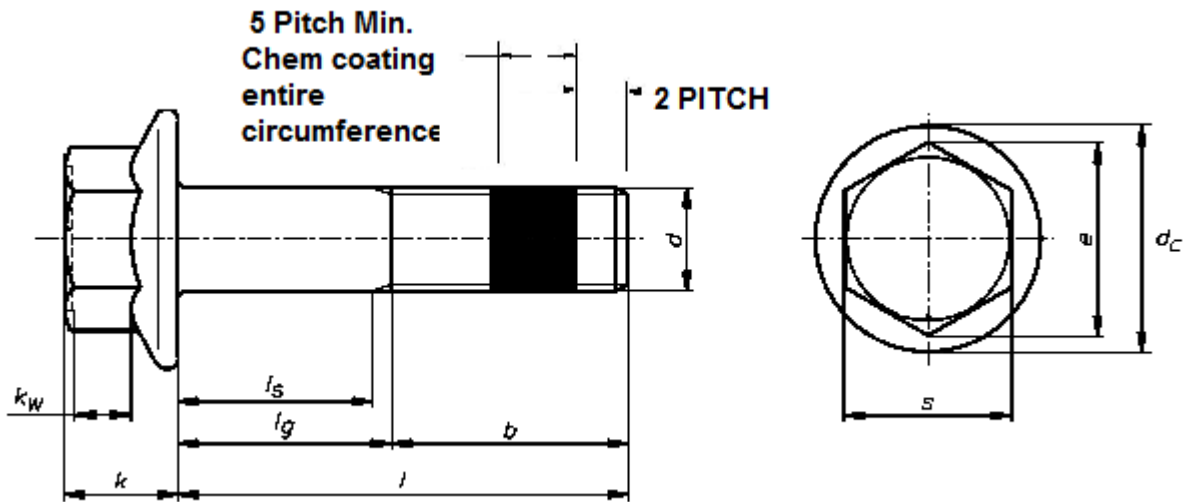


TABLE 5a. Locking Bolt Performance Requirements Per IFI525

Nominal Size	Prevailing On Torque	Break Away Torque	Prevailing Off Torque
	Nm Max	Nm Min	Nm Min
M6	1.8	1.5	0.8
M8	2.8	4.0	2.0
M10	5.5	11	4.0
M12	7.2	16	7.0
M14	11	22	10
M16	14	33	16
M20	22	45	22

Note: Values are based on nut engagement in chemical area for a distance of one nominal screw diameter.



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TABLE 6: Hexagon Flange Bolts With Chemical Coating per IFI 525

Nominal Diameter	Length	Thread Length	Across Flats	Material	Finish	Part Number
M10	14	FULL	15	10.9	PHC	9849338
M10	20	FULL	15	8.8	ZND	48056346
M10	25	FULL	15	8.8	ZND	48076614
M10	30	FULL	15	8.8	ZND	47532604
M10	70	26	15	8.8	ZND	90431637
M10	75	26	15	8.8	ZND	90431611
M10	80	26	15	8.8	ZND	90431620
M10	90	FULL	15	12.9	PHC	92316052
M10	105	26	15	8.8	ZND	90431652
M12	40	FULL	16	10.9	ZND	92092941
M20	90	46	27	10.9	BGM	92263226
M20	160	52	27	10.9	ZND	92115281
M20	200	52	27	10.9	ZND	92115282