


ATLANTA
Integrated Rack and Pinion Drive – Calculation and Selection – Module 2 – Helical Tooth System

Rack		HPIR	HPIR	BIR			BIR		
Quality		6 Width 19 mm	6 Width 24 mm	9 Width 20 mm			9 Width 25 mm		
Rack	Material	16MnCr5	16MnCr5	C45			C45		
	Heat Treatment	Induction Hardened	Induction Hardened	Soft			Soft		
Pinion	Material	16MnCr5	16MnCr5	16MnCr5	C45		16MnCr5	C45	
	Heat Treatment	Case Hardened	Case Hardened	Case Hardened	Ind. Hardened		Case Hardened	Ind. Hardened	
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force							
20	42.44	5.0 kN	6.0 kN	1.0 kN	0.8 kN		1.25 kN	1.00 kN	
25	53.05	5.4 kN	6.7 kN	1.0 kN	0.9 kN		1.25 kN	1.10 kN	
28	59.42	5.4 kN	6.7 kN	1.0 kN	1.0 kN		1.25 kN	1.25 kN	
32	67.91	5.5 kN	6.8 kN	1.5 kN	1.0 kN		1.80 kN	1.25 kN	
36	76.39	5.5 kN	6.8 kN	1.5 kN	1.0 kN		1.80 kN	1.25 kN	

1) Check availability (chapter ZA)

Maximum permissible Feed Forces ¹⁾ in kN

which are achieved with good grease lubrication (i.e. use of the electronic lubricator described on page ZE-2/3 or manual lubrication at least once a day) and $v=1.5$ m/s, $S_B=1.0$ as well as a linear load distribution factor $L_{KH\beta}$ of 1.0.

The values in the load tables are maximum values under perfect conditions and is a guide value.

A calculation of the application and configuration is in any cases needed.

Calculation and example see page ZD-1.

1) For keyway transmission make a separate calculation, torque with shrink disk see on page GH-1.





ATLANTA

Integrated Rack and Pinion Drive – Calculation and Selection – Module 3 – Helical Tooth System

Rack		HPIR		BIR					
Quality		6 Width 29 mm		9 Width 30 mm					
Rack	Material	16MnCr5		C45					
	Heat Treatment	Induction Hardened		Soft					
Pinion	Material	16MnCr5		16MnCr5	C45				
	Heat Treatment	Case Hardened		Case Hardened	Induction Hardened				
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force							
20	63.66	12.0 kN		1.5 kN	1.5 kN				
22	70.03	12.0 kN		1.5 kN	1.5 kN				
25	79.58	12.0 kN		2.5 kN	1.5 kN				
30	95.49	12.0 kN		3.0 kN	2.0 kN				

1) Check availability (chapter ZA)

Maximum permissible feed forces – description see page ZC-15


ATLANTA
Integrated Rack and Pinion Drive – Calculation and Selection – Module 4 – Helical Tooth System

Rack		HPIR		BIR				
Quality		6 Width 39 mm		9 Width 40/41 mm				
Rack	Material	16MnCr5		C45				
	Heat Treatment	Induction Hardened		Soft				
Pinion	Material	16MnCr5		16MnCr5	C45			
	Heat Treatment	Case Hardened		Case Hardened	Induction Hardened			
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force						
15	63.66	21.0 kN		2.5 kN	1.4 kN			
20	84.88	21.0 kN		3.5 kN	2.5 kN			
21	89.13	22.0 kN		3.5 kN	2.5 kN			
24	101.86	22.5 kN		4.5 kN	3.0 kN			
25	106.10	23.5 kN		5.0 kN	4.0 kN			

1) Check availability (chapter ZA)

Maximum permissible feed forces – description see page ZC-15





ATLANTA

Integrated Rack and Pinion Drive – Calculation and Selection – Pitch 5 – Straight Tooth System

Rack		HPIR	HPIR	BIR			BIR		
Quality		6 Width 19 mm	6 Width 24 mm	9 Width 20 mm			9 Width 25 mm		
Rack	Material	16MnCr5	16MnCr5	C45			C45		
	Heat Treatment	Induction Hardened	Induction Hardened	Soft			Soft		
Pinion	Material	16MnCr5	16MnCr5		C45			C45	
	Heat Treatment	Case Hardened	Case Hardened		Induction Hardened			Induction Hardened	
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force							
15	23.87	0.8 kN	0.9 kN		0.25 kN			0.3 kN	
20	31.83	2.6 kN	2.9 kN		0.5 kN			0.6 kN	
25	39.79	3.5 kN	4.0 kN		0.6 kN			0.7 kN	
30	47.75	3.7 kN	4.3 kN		0.8 kN			0.9 kN	
40	63.66	4.4 kN	5.0 kN		1.0 kN			1.2 kN	

1) Check availability (chapter ZC)

Maximum permissible feed forces – description see page ZC-15


ATLANTA
Integrated Rack And Pinion Drive – Calculation And Selection – Pitch 10 – Straight Tooth System

Rack		HPIR		BIR						
Quality		6 Width 29 mm		9 Width 30 mm						
Rack		16MnCr5		C45						
	Heat Treatment	Induction Hardened		Soft						
Pinion	Material	16MnCr5		16MnCr5	C45	C45				
	Heat Treatment	Case Hardened		Case Hardened	Induction Hardened	Soft				
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force								
15	47.75	3.6 kN		2.0 kN	1.5 kN	0.5 kN				
20	63.66	6.7 kN		2.4 kN	2.0 kN	1.4 kN				
25	79.58	11.0 kN		3.5 kN	2.5 kN	2.0 kN				
30	95.49	11.0 kN		4.0 kN	3.0 kN	2.5 kN				
40	127.32	12.0 kN		5.5 kN	4.0 kN	4.0 kN				

1) Check availability (chapter ZC)

Maximum permissible feed forces – description see page ZC-15





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Integrated Rack and Pinion Drive – Calculation and Selection – Pitch 13.33 – Straight Tooth System

Rack		HPIR		BIR						
Quality		6 Width 39 mm		9 Width 40 mm						
Rack	Material	16MnCr5		C45						
	Heat Treatment	Induction Hardened		Soft						
Pinion	Material	16MnCr5		16MnCr5	C45	C45				
	Heat Treatment	Case Hardened		Case Hardened	Induction Hardened	Soft				
No. of Pinion Teeth ¹⁾	Pitch Circle Dia.	Maximum Feed Force								
20	84.88	23.0 kN		5.0 kN	3.5 kN	3.0 kN				
25	106.10	23.0 kN		6.5 kN	4.5 kN	4.0 kN				

1) Check availability (chapter ZC)

Maximum permissible feed forces – description see page ZC-15