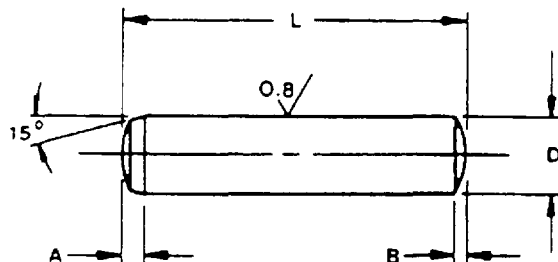


## NACCO Materials Handling Group, Inc.

## ENGINEERING SPECIFICATION

Title: METRIC - HARDENED AND GROUND - DOWEL PINS			Document Control Number: HCE-1021		
Page 1 of 2	Document Author: Bob Downey			Effective Date: 24-Aug-2010 Rev. No. 2010-08	

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Dimensions in millimeters (mm)

BODY DIAMETER D			CHAMFER LENGTH A		CROWN HEIGHT B (APPROX.)	SINGLE SHEAR STRENGTH (N)	RECOMMENDED HOLE SIZES			
							PRESS FIT		TRANSITIONAL FIT (H8)	
NOM	MAX	MIN	MIN	MAX			MIN	MAX	MAX	MIN
(3)	3.008	3.002	0.50	1.10	0.45	7 100	2.988	3	3.014	3.000
(4)	4.012	4.004	0.63	1.40	0.60	12 600	3.988	4	4.018	4.000
(5)	5.012	5.004	0.80	1.70	0.75	19 600	4.988	5	5.018	5.000
6	6.012	6.004	1.20	2.10	0.90	28 300	5.982	6	6.018	6.000
8	8.015	8.006	1.60	2.60	1.20	50 300	7.982	8	8.022	8.000
10	10.015	10.006	2.00	3.00	1.50	78 500	9.975	10	10.022	10.000
12	12.018	12.007	2.50	3.80	1.80	113 000	11.975	12	12.027	12.000
16	16.018	16.007	3.00	4.70	2.50	201 000	15.96	16	16.027	16.000
20	20.021	20.008	3.50	6.00	3.00	314 000	19.96	20	20.033	20.000
25	25.021	25.008	4.00	7.50	3.50	491 000	24.96	25	25.033	25.000

Notes: 1. Bracketed ( ) sizes are non-preferred.

2. Single shear strength is based on shear stress of 1000 MPa.

3. Recommended hole sizes are based on cast iron (HC-21).

**GENERAL:** The dowel pins covered in this specification shall conform to dimensional standards established by DIN EN 28 734 and ISO 8734.

**CITED:** DIN EN 28 734, Hardened Parallel Pins  
ISO 8734, Parallel Pins of Hardened Steel and Martensitic Stainless Steel (Dowel Pins)

**TOLERANCES:** Diameter: tolerance zone (ISO) m6  
Length: tolerance zone (ISO) js 15

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METRIC - HARDENED AND GROUND - DOWEL PINS

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**MATERIAL:** Alloy Steel

Hardness Range,

Surface: HRC 58 Min.  
Case Depth: 0.38 mm  
Core: HRC 48-58

**FINISH:** Plain

**DESCRIPTION:** DOWEL  
- size X length HCE-1021

Example: DOWEL – 4 X 10 HCE-1021

Dimensions in millimeters (mm)

LENGTH js 15	TOL ±	DIAMETER D							
		(3)	(4)	(5)	6	8	10	12	25
5	0.24								
6	0.24								
8	0.29								
10	0.29		0887012		0302355				
12	0.35			0887193	0302356				
14	0.35				0302357	0302369			
16	0.35		1511859		0302358	0302370			
20	0.42				0302359	0302371	0302384		
24	0.42			0367919	0302360	0302372	0302385	0303150	
28	0.42				0302361	0302373	0302386	0302397	
32	0.5		1495587		0304510	0304511	0304512	0326479	
36	0.5				0302362	0302374	0302387	0352406	
(38)	0.5		1495588						
40	0.5				0302363	0302375	0302388	0303151	
45	0.5				0302364	0302376	0302389		
50	0.5				0302365	0302377	0302390	0303152	1655259
55	0.6				0302366	0302378	0302391		
60	0.6				0302367	0302379	0302392	0303153	
65	0.6				0302368	0302380	0302393		
70	0.6					0302381	0302394		
75	0.6					0302382	0302395		
80	0.6					0302383	0302396		

Note: 1. Bracketed sizes ( ) are not recommended for new design.