

# CIVATA KILAVUZU

## Cıvatanın pratik seçimi

Seçim statik ve dinamik kuvvet içinde ayındır.

Kuvvet [kN]	Boyuna işletme kuvveti $F_{İŞ}$												
	Statik	1,6	2,5	4,0	6,3	10	16	20	25	40	63	80	100
<b>Dinamik</b>	<b>1,0</b>	<b>1,6</b>	<b>2,5</b>	<b>4,0</b>	<b>6,3</b>	<b>10</b>	<b>16</b>	<b>20</b>	<b>25</b>	<b>40</b>	<b>63</b>	<b>80</b>	<b>80</b>
Cıvata kalitesi ve çapı [mm]	4.6	6	8	10	14	16	20	24	24	30	---	---	---
	5.6	6	8	10	12	14	20	20	27	27	36	---	---
	6.8	5	6	8	10	12	16	20	20	24	30	36	---
	<b>8.8</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>20</b>	<b>24</b>	<b>27</b>	<b>30</b>
	10.9	4	5	6	8	10	12	12	14	16	20	24	27
	12.9	3	4	5	6	8	10	12	12	16	20	24	24

Örnek 1: İşletme kuvveti: 8,2 kN, dinamik, eksen dışı, şaftlı cıvata

**Cıvata seçimi, 10 kN, Cıvata kalitesi 8.8**

**M 12**

Örnek 2: İşletme kuvveti: 8,2 kN, dinamik, tam eksenden, şaftlı cıvata

**Cıvata seçimi, 10 kN, Cıvata kalitesi 8.8, bir boy küçük**

**M 10**

Örnek 3: İşletme kuvveti: 8,2 kN, dinamik, , eksen dışı, esnek cıvata

**Cıvata seçimi, 10 kN, Cıvata kalitesi 8.8, bir boy büyük**

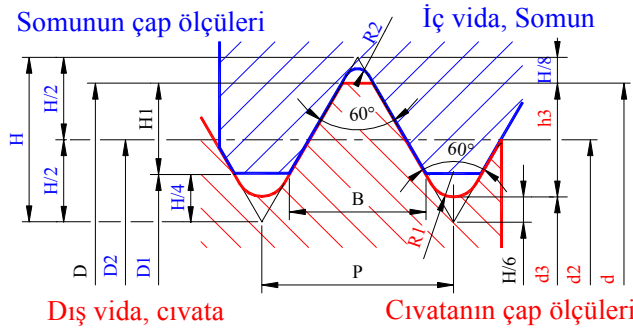
**M 14**

Örnek 4: İşletme kuvveti: 8,2 kN, dinamik, tam eksenden, , esnek cıvata

**Cıvata seçimi, 10 kN, Cıvata kalitesi 8.8, bir boy küçük, bir boy büyük**

**M 12**

## Standart metrik dişli vidalar



$$d_2 = D_2 = d - 0,64952 P \quad H = 0,86603 P$$

$$D_1 = d - 1,08253 P \quad H_1 = 0,54127 P$$

$$d_3 = d - 1,22687 P \quad h_3 = 0,61343 P$$

$$R_1 = H/6 = 0,14434 P \quad d_s = (d_2 + d_3)/2$$

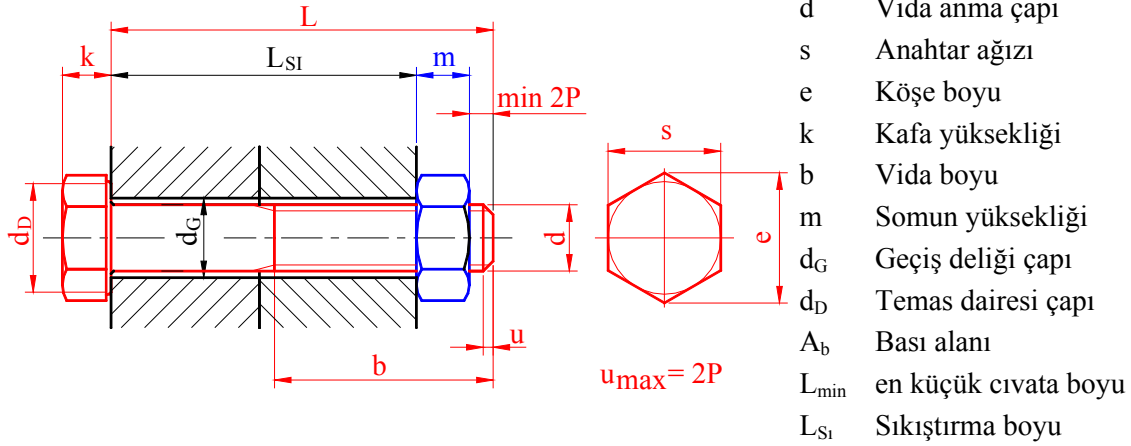
$$R_2 = H/12 = 0,07217 P \quad \tan \varphi = P/(\pi \cdot d_2)$$

**Matkap çapı  $D_M = d - P$**   
 **$d = M 12 = \text{Anma çapı } 12 \text{ mm}$**

Anma çapı $d = D$	Hatve (Adım) $P$	Bölüm çapı $d_2 = D_2$	Diş dibi çapı		Diş yüksekliği		Gerilim kesiti $A_{GE} \text{ mm}^2$	Diş dibi kesiti $A_3 \text{ mm}^2$	Helis açısı $\varphi$
			$d_3$	$D_1$	$h_3$	$H_1$			
<b>M 5</b>	<b>0.8</b>	<b>4.480</b>	<b>4.019</b>	<b>4.134</b>	<b>0.491</b>	<b>0.433</b>	<b>14.183</b>	<b>12.683</b>	<b>3.253°</b>
M 6	1	5.350	4.773	4.917	0.613	0.541	20.123	17.894	3.405°
<b>M 8</b>	<b>1.25</b>	<b>7.188</b>	<b>6.466</b>	<b>6.647</b>	<b>0.767</b>	<b>0.677</b>	<b>36.609</b>	<b>32.841</b>	<b>3.168°</b>
M 10	1.5	9.026	8.160	8.376	0.920	0.812	57.990	52.292	3.028°
<b>M 12</b>	<b>1.75</b>	<b>10.863</b>	<b>9.853</b>	<b>10.106</b>	<b>1.074</b>	<b>0.947</b>	<b>84.267</b>	<b>76.247</b>	<b>2.935°</b>
M 14	2	12.701	11.546	11.835	1.227	1.083	115.439	104.706	2.869°
<b>M 16</b>	<b>2</b>	<b>14.701</b>	<b>13.546</b>	<b>13.835</b>	<b>1.227</b>	<b>1.083</b>	<b>156.668</b>	<b>144.121</b>	<b>2.480°</b>
M 20	2.5	18.376	16.933	17.294	1.534	1.353	244.794	225.190	2.480°
<b>M 22</b>	<b>2.5</b>	<b>20.376</b>	<b>18.933</b>	<b>19.294</b>	<b>1.534</b>	<b>1.353</b>	<b>303.399</b>	<b>281.527</b>	<b>2.237°</b>
M 24	3	22.051	20.319	20.752	1.840	1.624	352.504	324.273	2.480°
<b>M 27</b>	<b>3</b>	<b>25.051</b>	<b>23.319</b>	<b>23.752</b>	<b>1.840</b>	<b>1.624</b>	<b>459.406</b>	<b>427.095</b>	<b>2.183°</b>
M 30	3.5	27.727	25.706	26.211	2.147	1.894	560.587	518.988	2.301°

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## 6-Köşe civataların ölçüleri



d	s	e	k	b		m		d <sub>G</sub>			d <sub>D</sub>	A <sub>b</sub>	L <sub>min</sub>
				*)1	*)2	*)3	*)4	hass	nor	kaba			*)5
<b>M 5</b>	<b>8</b>	<b>8.79</b>	<b>3.5</b>	<b>16</b>	<b>22</b>	<b>4,7</b>	<b>2,7</b>	<b>5.3</b>	<b>5.5</b>	<b>5.8</b>	<b>6.9</b>	<b>13.6</b>	<b>10</b>
M 6	10	11.1	4	18	24	5,2	3,2	6.4	6.6	7	8.9	28.0	12
<b>M 8</b>	<b>13</b>	<b>14.4</b>	<b>5.3</b>	<b>22</b>	<b>28</b>	<b>6,8</b>	<b>4</b>	<b>8.4</b>	<b>9</b>	<b>10</b>	<b>11.6</b>	<b>42.1</b>	<b>16</b>
M 10	16	17.8	6.4	26	32	8,4	5	10,5	11	12	14.6	72.4	20
<b>M 12</b>	<b>18</b>	<b>20.1</b>	<b>7.5</b>	<b>30</b>	<b>36</b>	<b>10,8</b>	<b>6</b>	<b>13</b>	<b>13,5</b>	<b>14,5</b>	<b>16.6</b>	<b>73.3</b>	<b>25</b>
M 14	21	23.4	8.8	34	40	12,8	7	15	15,5	16,5	19.6	113	30
<b>M 16</b>	<b>24</b>	<b>26.8</b>	<b>10</b>	<b>38</b>	<b>44</b>	<b>14,8</b>	<b>8</b>	<b>17</b>	<b>17,5</b>	<b>18,5</b>	<b>22.5</b>	<b>157</b>	<b>30</b>
M 20	30	33.5	12.5	46	52	18	10	21	22	24	28.2	244	40
<b>M 22</b>	<b>34</b>	<b>37.7</b>	<b>14</b>	<b>50</b>	<b>56</b>	<b>20</b>	<b>11</b>	<b>23</b>	<b>24</b>	<b>26</b>	<b>31.7</b>	<b>337</b>	<b>45</b>
M 24	36	40	15	54	60	21,5	12	25	26	28	33.6	356	50
<b>M 27</b>	<b>41</b>	<b>45.2</b>	<b>17</b>	<b>60</b>	<b>66</b>	<b>24</b>	<b>13</b>	<b>28</b>	<b>30</b>	<b>32</b>	<b>38.0</b>	<b>427</b>	<b>55</b>
M 30	46	50.9	18.7	66	72	25,6	15	31	33	35	42.7	577	60

\*)1 L ≤ 125 mm için ; \*)2 L > 125, 200 mm ye kadar ; \*)3 somun tipi 1 için ; \*)4 basık somun için

\*)5 Boy basamağı : 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, 220, 240, 260, 280, 300, 320, 340, ..., 500.

## Civataların sıkma kuvveti ve sıkma momenti

Piyasadan satın alınan civata ve somunlar,  $\mu_V \approx \mu_B \approx \mu_{gen} \approx 0,12$  ve tork anahtarlarıyla sıkılmak için.

Vida	Montajda boyuna kuvvet F <sub>S1</sub> , kN			Montajda sıkma momenti M <sub>S1</sub> , Nm		
	8.8	10.9	12.9	8.8	10.9	12.9
<b>M 5</b>	<b>5,4±1,3</b>	<b>7,6±1,8</b>	<b>9,1±2,1</b>	<b>4,6±1</b>	<b>6,4±1,5</b>	<b>7,7±1,8</b>
M 6	7,6±1,8	10,7±2,5	12,8±3	7,8±1,8	11±2,5	13±3
<b>M 8</b>	<b>14±3,2</b>	<b>19,7±4,5</b>	<b>23,5±5,5</b>	<b>20±4</b>	<b>27±6</b>	<b>32±7</b>
M 10	22,3±5,1	31,3±7,2	37,5±8,5	38±8	53±12	63±14
<b>M 12</b>	<b>32,5±7,5</b>	<b>46±10</b>	<b>55±12,5</b>	<b>65±15</b>	<b>90±20</b>	<b>108±25</b>
M 14	45±10	62,5±14,5	75±17,5	100±25	145±30	170±40
<b>M 16</b>	<b>61,5±14</b>	<b>86±20</b>	<b>105±23</b>	<b>160±35</b>	<b>220±50</b>	<b>265±60</b>
M 20	96±22	135±31	160±39	310±70	435±100	520±120
<b>M 22</b>	<b>120±27</b>	<b>168±39</b>	<b>202±47</b>	<b>415±95</b>	<b>585±135</b>	<b>705±160</b>
M 24	140±30	194±45	233±55	530±125	750±170	900±200
<b>M 27</b>	<b>181±42</b>	<b>255±60</b>	<b>306±71</b>	<b>785±180</b>	<b>1105±255</b>	<b>1325±305</b>
M 30	222±50	309±71	372±86	1070±245	1500±345	1800±415