



电 热 元 件 产 品 说 明 书



登封创威碳化物制品有限公司
Dengfeng Chuangwei carbide products Co., Ltd.

公司简介

登封市创威碳化物制品有限公司,位于中原腹地世界文化遗产嵩山风景区,距禅宗圣地少林寺向南10公里处,公司主要从事于二硅化钼电热元件和碳化硅电热元件及钨钼材料的研究和生产开发,拥有电热元件行业的高级工程师研发和专业技术指导,不断提升产品品质,积累了丰富的制造经验,雄厚的技术力量,先进的工艺装备,完整的质量保证体系和科学的管理模式。其中硅碳棒分为:等直棒、粗端部棒、枪棒、U型棒、五节棒、特种1400型棒等几大品种上千种规格,硅钼棒分为:U型棒、W型棒和特种1800型棒;产品广泛应用于电子、陶瓷、玻璃、荧光材料、磁性材料、冶炼耐火材料等特种行业,产品销往全国各地,并出口美国、加拿大、英国、瑞典、德国、西班牙、捷克、乌克兰、日本、韩国、印度、澳大利亚、新西兰、巴西、墨西哥、马来西亚、泰国、伊朗、南非、港台等四十多个国家和地区,客户包括各领域世界知名跨国厂商。

我们始终坚持以质量求生存,以信誉求发展,以尽善尽美的服务和灵活的经营方式为宗旨服务于广大中外客商,满足不同客户的需求,并引进一批先进的设备不断开发研制新的产品,扩大公司规模及生产线,经过我们不懈的努力,"创威"产品将成为中国电热元件行业发展的先锋。

Dengfeng Chuangwei carbide products Co., Ltd., located in the Songshan scenic area of the world cultural heritage of Zhongyuan hinterland, is 10 km south from the Shaolin Temple of Zen sect. The company is mainly engaged in the research and production of two molybdenum electrothermal components, silicon carbide electric heating elements and tungsten and molybdenum materials. Professional technical guidance, continuously improve the quality of products, accumulated rich experience in manufacturing, strong technical force, advanced technology and equipment, a complete quality assurance system and scientific management model. The silicon and carbon rods are divided into several thousand specs such as straight rod, rough end bar, gun bar, U rod, five bar rod and special 1400 type rod. The silicon and molybdenum rods are divided into U bar, W bar and special 1800 type rod. The products are widely used in the special industries such as electronic, ceramic, glass, fluorescent material, magnetic material, smelting refractory material and so on. They are sold all over the country, and export to more than 40 countries and regions, including the United States, Canada, Britain, Sweden, Germany, Spain, Czech, Ukraine, Japan, South Korea, India, Australia, New Zealand, Brazil, Mexico, Malaysia, Thailand, Iran, South Africa, Hong Kong and Taiwan, etc., including the world famous across the world. National manufacturer.

We always adhere to the quality of survival, reputation for development, the perfect service and flexible management mode for the purpose of serving the vast number of Chinese and foreign customers, to meet the needs of different customers, and the introduction of a batch of advanced equipment to develop new products, expand the company's model and production line, through our unremitting efforts, "Chuang Wei" Products will become the pioneer of the development of China's electrothermal components industry.

碳化硅电热元件

SiC Heating Elements

概 述

General description

碳化硅电热元件是选用优质绿色碳化硅为主要原料,经加工制坯、高温硅化、再结晶而形成的管状非金属高温电热元件。该元件与金属电热元件相比,具有使用温度高、抗氧化、耐腐蚀、寿命长、变形小、安装维修方便等特点。因此碳化硅电热元件被广泛应用于磁性材料、粉末冶金、陶瓷、玻璃、冶金和机械等工业的多种高温电炉及其它电加热设备上。

我们的碳化硅电热元件采用最新的冷端部生产工艺,具有优质的热、冷端部电阻比、节能、寿命长,同时避免了因冷端部温度过高对炉体造成的损害。

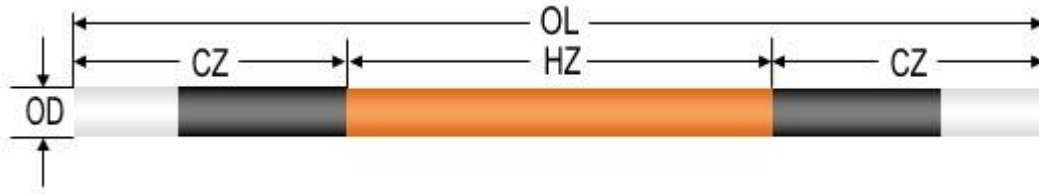
The Sic electric heating element is mainly made of high quality green silicon carbide, it' s a kind of tubular and non-metallic high temperature Electric Heating Element produced by processing of making semifinished product, high-temperature silicification, re-crystallization. Compared to metal electric heating elements, it has advantages of high working temperature, anti-oxidation, corrosion resistance, long service life, little deformation, easy installation and maintaining etc. So Sic electric heating element is widely used in high temperature furnaces and other electric heating equipments of magnetic materials, powder metallurgy, ceramics, glass, metallurgy, machinery and other industries.

Our Sic heating element adopt the most advanced production technology for the cold end , it has the advantages of quality of hot-cold end resistance ratio, energy saving, long service life, and avoiding the damage to the furnace body due to high temperature of cold end.

碳化硅电热元件的产品型号

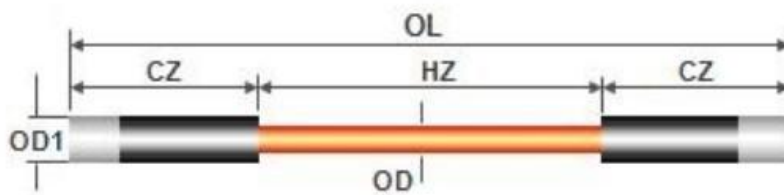
Product Types of Sic Heating Elements

等直径元件 GD(rod) type elements



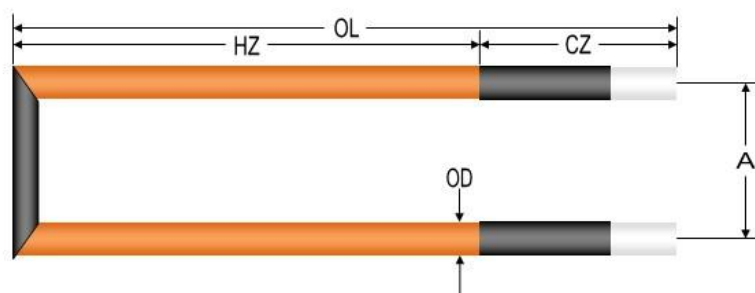
型号 Type:GD 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold End Length:CZ,mm 全长 Overall Length:OL,mm

DC(粗端)型元件 DB(dumbbell) type elements

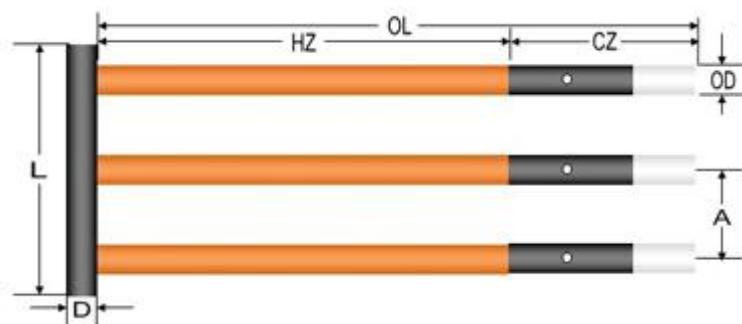


型号 Type:DC 外径 Outer Diameter:OD/OD1,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold End Length:CZ,mm 全长 Overall Length:OL,mm

GDU 型元件 GDU type elements

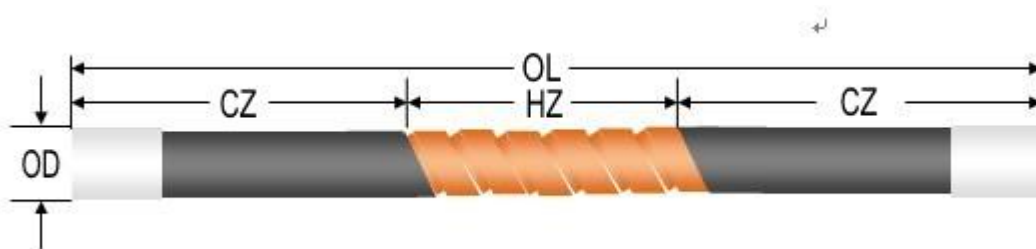


型号 Type:GDU 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold end Length:CZ,mm 全长 Overall Length:OL,mm
 间距 Shank Spacing:A,mm



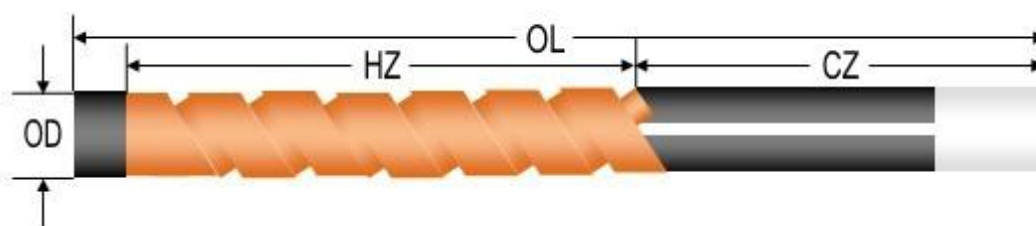
型号 Type:W 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold end Length:CZ,mm 全长 Overall Length:OL,mm
 间距 Shank Spacing:A,mm 连接桥 Bridge:D,mm

SC(单螺旋) 型元件 SC(single spiral) type elements



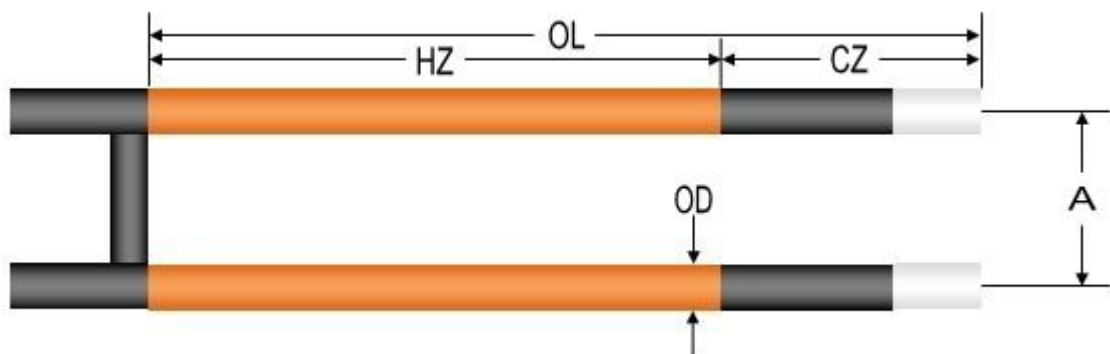
型号 Type:SC 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold end Length:CZ,mm 全长 Overall Length:OL,mm

SCR(双螺旋) 型元件 SCR(double spiral) type elements



型号 Type:SCR 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold End Length:CZ,mm 全长 Overall Length:OL,mm

H 型元件 H type elements



型号 Type:U 外径 Outer Diameter:OD,mm 发热部长度 Hot Zone Length:HZ,mm
 冷端长度 Cold End Length:CZ,mm 全长 Overall Length:OL,mm
 间距 Shank Spacing:A,mm

碳化硅电热元件的主要性能 Key Features of Sic Heating Elements

最高工作温度 Maximum operating temperature ($^{\circ}\text{C}$)	密度 Density (g/cm^3)	热传导 Heat Conduction [$\text{W}/(\text{m} \cdot ^{\circ}\text{C})$]	比热容 Specific heat capacity [$\text{KJ}/(\text{kg} \cdot ^{\circ}\text{C})$]
1500	2.2~2.4	23.26	0.71

电阻率 Resistivity ($\Omega \cdot \text{mm}^2/\text{m}$)	热胀系数 Thermal expansion coefficient ($20 \sim 1500^{\circ}\text{C}$) ($\times 10^{-6}/^{\circ}\text{C}$)	抗拉强度 Tensile strength (M Pa)	抗弯强度 Flexural strength (M Pa)
1000~2000	5	39.2~49	70~90

碳化硅电热元件的物理性质 Physical Properties of Sic Heating Elements

硅碳棒电热元件的线膨胀系数、热传导率和比热等随温度的变化而变化,相关数据如下:
 The linear expansion coefficient, thermal conductivity and specific heat of SiC element along with temperature changes. And the relative data show as followings:

温度 Temperature (°C)	线膨胀系数 Linear Expansion Coefficient (10 ⁻⁶ m/°C)	热传导率 Thermal Conductivity (k cal/Mgr°C)	比热 Specific Heat (cal/g°C)
0	/	/	0.148
300	3.8	/	/
400	/	/	0.255
600	4.3	14-18	/
800	/	/	0.294
900	4.5	/	/
1100	/	12-16	/
1200	4.8	/	0.325
1300	/	10-14	/
1500	5.2	/	/

碳化硅电热元件的抗氧化性 Oxidation Resistance of Sic Heating Elements

硅碳棒电热元件在空气中使用到 800°C 时开始氧化，温度达到 100-1200°C 时，发热部表面生成一层二氧化硅保护膜，1200°C 时结晶出方石英，在 1400°C 时，保护膜达到一定厚度，从而使元件的氧化速度变得极为缓慢，趋于稳定。如果继续升温至 1527°C 以上时，则保护膜受到破坏，氧化速度显著增加，造成元件过早损坏。

硅碳棒电热元件在使用过程中虽然氧化极为缓慢，但长时间运行仍然会导致电阻增大，这种现象叫做老化。

SiC heating element begins to oxidize in the air when the temperature goes to 800 °C, there will be a SiO₂ protective film generated on the surface when it reaches to 100-1200 °C, crystallizing cristobalite at 1200 °C, the protection film reaches a certain thickness at 1400 °C, and then the rate of oxidation element becomes extremely slow and steady. It will result in the damages to the protective film, increasing the rate of oxidation and premature failure of components if it continues to heat up to 1527 °C or above .

The Oxidation of Silicon Carbide Heating Elements is extremely slow during working , but it will still lead to increasing resistance for long time working, this is called aging of the element.

碳化硅电热元件在不同气氛下的使用温度和表面负荷

Temperature and Surface Load of SiC elements Under Different Atmospheres

气氛 Atmosphere	炉温 (°C) Furnace	表面负荷 (W/cm ²) Surface Load	对元件的影响 Effect On Elements	解决办法 Solution
氨	1290	3.8	与 sic 作用生成甲烷减少 sio2 保护膜 Decreasing SiO ₂ protective film by Acting with SiC to generate Methane	露点激活 Make it active at dew point
CO ₂	1450	3.1	腐蚀碳化硅 Attacking sic	用石英管保护 Protecting by quartz tube
18%CO	1500	4.0	无影响 No	
20%CO	130	3.8	吸附碳粒影响 sio2 保护膜 Affecting SiO ₂ protective film by Adsorbing C grains	
卤素	704	3.8	腐蚀碳化硅减少 sio2 保护膜 Decreasing SiO ₂ protective film by eroding SiC	用石英管保护 Protecting by quartz tube
碳氢化合物	1310	3.1	吸附碳粒致热污染, 分解的碳沉积, 易造成电气故障 Causing hot pollution by adsorbing C grains	送进充分的空气 Filling with plenty of air
氢	1290	3.1	与 sic 作用反应生成甲烷, 减少 sic2 保护膜 Decreasing SiO ₂ protective film by Acting with SiC to generate Methane	露点激活 Make it Active at dew point
甲烷	1370	3.1	吸附碳粒致热污染 Causing hot pollution by adsorbing C grains	
N	1370	3.1	与 sic 反应形成氮化硅绝缘 Generating SiN insulating layer by acting with SiC	
Na	1310	3.8	侵蚀碳化硅 Eroding sic	用石英管保护 Protecting by quartz tube
S02	1310	3.8	侵蚀碳化硅 Eroding sic	用石英管保护 Protecting by

12/150/200	550	56.5	1.7	<u>1017</u> 42 (24.5)	<u>795</u> 37 (21.4)	<u>565</u> 31 (18.2)	<u>340</u> 24 (14.2)
12/200/200	600	75.0	2.2	<u>1350</u> 55 (24.8)	<u>1050</u> 48 (21.8)	<u>755</u> 41 (18.5)	<u>450</u> 31.5 (14.3)
12/250/200	650	94.0	2.8	<u>1692</u> 69 (24.6)	<u>1320</u> 61 (21.6)	<u>940</u> 51 (18.4)	<u>565</u> 40 (14.2)
12/300/200	700	113.0	3.2	<u>1808</u> 73 (24.8)	<u>1400</u> 64 (21.8)	<u>980</u> 53 (18.5)	<u>620</u> 43 (14.3)
14/200/250	700	88.0	1.8	<u>1584</u> 54 (29.7)	<u>1230</u> 47 (26.2)	<u>880</u> 40 (22)	<u>530</u> 31 (17.2)
14/200/350	900						
14/250/250	750	110.0	2.2	<u>1980</u> 66 (30)	<u>1540</u> 58 (26.6)	<u>1100</u> 49 (22.4)	<u>665</u> 38 (17.3)
14/250/350	900						
14/300/250	800	132.0	2.6	<u>2376</u> 79 (30.2)	<u>1850</u> 69 (26.7)	<u>1320</u> 59 (22.4)	<u>785</u> 45 (17.4)
14/300/350	1000						
14/400/250	900	176.0	3.5	<u>3168</u> 105 (30.7)	<u>2450</u> 93 (26.4)	<u>1750</u> 78 (22.5)	<u>1060</u> 61 (17.4)
14/400/350	1100						
14/500/250	1000	220.0	4.4	<u>3960</u> 132 (30)	<u>3080</u> 116 (26.4)	<u>2200</u> 99 (22.4)	<u>1320</u> 76 (17.3)
14/500/350	1200						
							quartz tube
真空	1204	3.8					
氧	1310	3.8		碳化硅被氧化 Sic oxidized			
水(不同含量)	1090-1370	3.1-3.6		与 sic 作用生成硅的水化物 Generating hydrate of silicon by acting on SiC			

GD 型产品规格表 ED Type Product Specifications

规格尺寸/mm (D/HZ/CZ)	总长/mm (OL)	发热部表 面积/cm ² Hot zone Surface Area	1050° C 时 电阻/Ω At 1050° C Resistanc e	不同炉温下每支硅碳棒的功率、电压、电流			
				功率/W			
				电压/V (电流/A)			
				1200° C	1300° C	1350° C	1400° C
8/14/150/85	320	38.0	3.0	<u>528</u>	<u>451</u>	<u>319</u>	<u>189</u>
8/14/150/150	450			40 (13.4)	37 (12.2)	31 (10.3)	24 (7.9)
8/14/180/85	350	45.0	4.0	<u>734</u>	<u>576</u>	<u>418</u>	<u>249</u>
8/14/180/150	400			54 (13.6)	48 (12.0)	41 (10.2)	31.6 (7.9)
8/14/200/85	370	50.0	4.8	<u>900</u>	<u>700</u>	<u>500</u>	<u>300</u>
8/14/200/150	500			66 (13.7)	58 (12.1)	49 (10.2)	38 (7.9)
8/14/250/100	450	63.0	6.2	<u>1134</u>	<u>880</u>	<u>630</u>	<u>385</u>
8/14/250/150	550			84 (13.5)	74 (11.9)	62 (10.1)	49 (7.9)
8/14/300/85	470	75.0	7.4	<u>1350</u>	<u>1050</u>	<u>750</u>	<u>450</u>
8/14/300/150	600			100(13.5)	88 (12.0)	75 (10.1)	58 (7.8)

14/600/250	1100	264.0	5.2	<u>4752</u>	<u>3700</u>	<u>2650</u>	<u>1580</u>
14/600/350	1300			157 (30.2)	139 (26.6)	118 (22.6)	91 (17.4)
16/300/250	800	150.7	2.0	<u>2450</u>	<u>1909</u>	<u>1331</u>	<u>757</u>
16/300/350	1000			70 (35)	62 (30.8)	51.6 (25.8)	39 (19.4)
16/400/250	900	201.0	2.5	<u>3177</u>	<u>2318</u>	<u>1638</u>	<u>955</u>
16/400/350	1100			89 (35.7)	76 (30.5)	64 (25.6)	49 (19.5)
16/500/250	1000	251.2	3.0	<u>3877</u>	<u>2806</u>	<u>1971</u>	<u>1131</u>
16/500/350	1200			108 (35.9)	92 (30.5)	77 (25.6)	58 (19.5)
16/600/250	1100	301.4	4.0	<u>5119</u>	<u>3733</u>	<u>2657</u>	<u>1513</u>
16/600/350	1300			143 (35.8)	122 (30.6)	103 (25.8)	78 (19.4)
18/250/250	750	141.0	1.3	<u>2538</u>	<u>1970</u>	<u>1410</u>	<u>840</u>
18/250/350	950			57 (44.2)	51 (38.8)	43 (32.8)	33 (25.5)
18/300/250	800	170.0	1.5	<u>2713</u>	<u>2083</u>	<u>1480</u>	<u>906</u>
18/300/350	1000			64 (42.4)	56 (37.2)	47 (31.5)	37 (24.5)
18/400/350	1100	226.0	1.9	<u>3368</u>	<u>2641</u>	<u>1884</u>	<u>1118</u>
18/400/400	1200			80 (42.1)	71 (37.2)	60 (31.4)	46 (24.3)
18/500/350	1200	283.0	2.3	<u>4340</u>	<u>3199</u>	<u>2445</u>	<u>1456</u>
18/500/400	1300			100 (43.4)	86 (37.6)	75 (32.6)	58 (25.1)
18/600/350	1300	340.0	2.7	<u>4833</u>	<u>3835</u>	<u>2735</u>	<u>1617</u>
18/600/400	1400			114 (42.4)	102 (37.6)	86 (31.8)	66 (24.5)
18/800/350	1500	450.0	3.1	<u>5719</u>	<u>4278</u>	<u>3178</u>	<u>1815</u>
18/800/400	1600			133 (43)	115 (37.2)	99 (32.1)	75 (24.2)
20/300/250	800	188.4	1.2	<u>3289</u>	<u>2419</u>	<u>1771</u>	<u>1011</u>
20/300/350	1000			63 (52.2)	54 (44.8)	46 (38.5)	35 (28.9)
20/400/350	1100	251.0	1.5	<u>4079</u>	<u>3015</u>	<u>2233</u>	<u>1242</u>
20/400/400	1200			78 (52.3)	67 (45)	58 (38.5)	43 (28.9)
20/500/350	1200	314.0	1.9	<u>5158</u>	<u>3825</u>	<u>2736</u>	<u>1595</u>
20/500/400	1300			99 (52.1)	85 (45)	72 (38)	55 (29)
20/600/350	1300	376.0	2.2	<u>5928</u>	<u>4455</u>	<u>3354</u>	<u>1856</u>
20/600/400	1400			114 (52)	99 (45)	86 (39)	64 (29)
20/700/350	1300	439.0	2.7	<u>7200</u>	<u>5445</u>	<u>4004</u>	<u>2262</u>
20/700/400	1400			139 (51.8)	121 (45)	104 (38.5)	78 (29)
20/800/300	1400	502.0	2.9	<u>7867</u>	<u>5850</u>	<u>4345</u>	<u>2390</u>
20/800/350	1500			151 (52.1)	130 (45)	112 (38.8)	83 (28.8)
20/900/300	1500	565.0	3.1	<u>8372</u>	<u>6255</u>	<u>4719</u>	<u>2610</u>
20/900/350	1600			161 (52)	139 (45)	121 (39)	90 (29)
25/300/300	900	236.0	0.9	<u>3770</u>	<u>3100</u>	<u>2156</u>	<u>1292</u>
25/300/350	1000			58 (65)	53 (58.5)	44 (49)	34 (38)

25/400/350	1100	314.0	1.1	<u>4694</u>	<u>3712</u>	<u>2586</u>	<u>1604</u>
25/400/400	1200			72 (65.2)	64 (58)	53 (48.8)	42 (38.2)
25/500/350	1200	392.0	1.3	<u>5460</u>	<u>4350</u>	<u>3136</u>	<u>1862</u>
25/500/400	1300			84 (65)	75 (58)	64 (49)	49 (38)
25/600/400	1400	470.0	1.6	<u>6760</u>	<u>5394</u>	<u>3783</u>	<u>2318</u>
25/600/500	1600			104 (65)	93 (58)	78 (48.5)	61 (38)
25/800/400	1600	627.0	1.8	<u>7605</u>	<u>6032</u>	<u>4312</u>	<u>2584</u>
25/800/500	1800			117 (65)	104 (58)	88 (49)	68 (38)
25/1000/300	1600	785.0	2.4	<u>10140</u>	<u>8062</u>	<u>5626</u>	<u>3666</u>
25/1000/400	1800			156 (65)	139 (58)	116 (48.5)	94 (39)
30/400/300	1000	380.0	0.7	<u>5993</u>	<u>4480</u>	<u>3288</u>	<u>1968</u>
30/400/400	1200			65 (92.2)	56 (80)	48 (68.5)	37 (53.2)
30/500/300	1100	470.0	0.9	<u>7636</u>	<u>5774</u>	<u>4148</u>	<u>2544</u>
30/500/350	1200			83 (92)	72 (80.2)	61 (68)	48 (53)
30/600/350	1300	570.0	1.0	<u>8464</u>	<u>6400</u>	<u>4624</u>	<u>2809</u>
30/600/400	1400			92 (92)	80 (80)	68 (68)	53 (53)
30/700/400	1500	660.0	1.2	<u>10120</u>	<u>7680</u>	<u>5576</u>	<u>3392</u>
30/700/450	1600			110 (92)	96 (80)	82 (68)	64 (53)
30/800/450	1700	750.0	1.4	<u>11776</u>	<u>8960</u>	<u>6460</u>	<u>3922</u>
30/800/500	1800			128 (92)	112 (80)	95 (68)	74 (53)
30/900/350	1600	850.0	1.5	<u>12696</u>	<u>9600</u>	<u>6936</u>	<u>4187</u>
30/900/400	1700			138 (92)	120 (80)	102 (68)	79 (53)
30/1000/300	1600	940.0	1.7	<u>14352</u>	<u>10880</u>	<u>7820</u>	<u>4770</u>
30/1000/350	1700			156 (92)	136 (80)	115 (68)	90 (53)
30/1100/300	1700	1035.0	1.8	<u>15180</u>	<u>11520</u>	<u>8296</u>	<u>5035</u>
30/1100/350	1800			165 (92)	144 (80)	122 (68)	95 (53)
30/1500/300	2100	1410.0	2.7	<u>22816</u>	<u>17280</u>	<u>12512</u>	<u>7579</u>
30/1500/350	2200			248 (92)	216 (80)	184 (68)	143 (53)
35/400/350	1100	440.0	0.7	<u>8927</u>	<u>6664</u>	<u>4814</u>	<u>2772</u>
35/400/400	1200			79 (113)	68 (98)	58 (83)	44 (63)
35/500/350	1200	550.0	0.9	<u>11526</u>	<u>8624</u>	<u>6225</u>	<u>3516</u>
35/500/400	1300			102 (113)	88 (98)	75 (83)	56 (62.8)
35/600/350	1300	660.0	1.1	<u>14012</u>	<u>10584</u>	<u>7553</u>	<u>4347</u>
35/600/400	1400			124 (113)	108 (98)	91 (83)	69 (63)
35/800/350	1500	880.0	1.4	<u>17854</u>	<u>13426</u>	<u>9628</u>	<u>5544</u>
35/800/400	1600			158 (113)	137 (98)	116 (83)	88 (63)
35/1000/350	1700	1100.0	1.7	<u>21696</u>	<u>16268</u>	<u>11703</u>	<u>6741</u>
35/1000/400	1800			192 (113)	166 (98)	141 (83)	107 (63)



登封创威碳化物制品有限公司

Dengfeng Chuangwei carbide products Co., Ltd.

35/1200/350	1900	1320.0	2.0	<u>25538</u>	<u>19208</u>	<u>13778</u>	<u>7938</u>
35/1200/400	2000			226 (113)	196 (98)	166 (83)	126 (63)
35/1500/350	2200	1650.0	2.5	<u>31866</u>	<u>24010</u>	<u>17181</u>	<u>9891</u>
35/1500/400	2300			282 (113)	245 (98)	207 (83)	157 (63)
35/1700/300	2300	1870.0	2.9	<u>36951</u>	<u>27832</u>	<u>19920</u>	<u>11529</u>
35/1700/350	2400			327 (113)	284 (98)	240 (83)	183 (63)
35/2000/300	2600	2200.0	3.4	<u>43392</u>	<u>32634</u>	<u>23406</u>	<u>13482</u>
35/2000/400	2800			384 (113)	333 (98)	282 (83)	214 (63)
40/500/350	1200	628.0	0.6	<u>10140</u>	<u>7260</u>	<u>5236</u>	<u>3096</u>
40/500/400	1300			78 (130)	66 (110)	56 (93.5)	43 (72)
40/600/350	1300	753.0	0.7	<u>12144</u>	8470	<u>6077</u>	<u>3600</u>
40/600/400	1400			92 (132)	77 (110)	65 (93.5)	50 (72)
40/800/350	1500	1005.0	0.9	<u>15210</u>	<u>10890</u>	<u>7812</u>	<u>4680</u>
40/800/400	1600			117 (130)	99 (110)	84 (93)	65 (72)
40/1000/350	1700	1255.0	1.2	<u>20280</u>	<u>14520</u>	<u>10416</u>	<u>6192</u>
40/1000/400	1800			156 (130)	132 (110)	112 (93)	86 (72)
40/1200/350	1900	1506.0	1.4	<u>23660</u>	<u>16940</u>	<u>12090</u>	<u>7272</u>
40/1200/400	2000			182 (130)	154 (110)	130 (93)	101 (72)
40/1500/350	2200	1880.0	1.8	<u>30420</u>	<u>21780</u>	<u>15531</u>	<u>9288</u>
40/1500/400	2300			234 (130)	198 (110)	167 (93)	129 (72)
40/1700/300	2300	2140.0	2.0	<u>33800</u>	<u>24200</u>	<u>17298</u>	<u>10368</u>
40/1700/350	2400			260 (130)	220 (110)	186 (93)	144 (72)
40/2000/300	2600	2510.0	2.4	<u>40560</u>	<u>29040</u>	<u>20739</u>	<u>12456</u>
40/2000/400	2800			312 (130)	264 (110)	223 (93)	173 (72)