

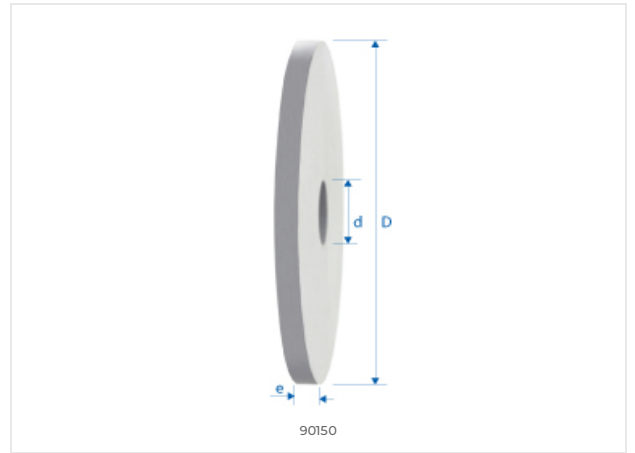
13  
∅ D (MM)

## MATERIAL COMPATIBILITY

●●● Excellent (3/3) ●● Good (2/3) ●○ Possible (1/3) ○○ Not recommended

MATERIAL	SPECIFICATION	GRP	90150-13-0-2.8
<b>Alloyed and non-alloyed steels</b> Non-alloyed steels	Rm < 450 N/mm <sup>2</sup>	1a	○○○
	Rm 450–700 N/mm <sup>2</sup>	1b	○○○
	Rm 700–900 N/mm <sup>2</sup>	1c	○○○
	Rm > 1200 N/mm <sup>2</sup>	1d	○○○
<b>Stainless steels</b> Stainless steels	Rm < 650 N/mm <sup>2</sup>	2a	○○○
	Rm 650–950 N/mm <sup>2</sup>	2b	○○○
	Rm > 950 N/mm <sup>2</sup>	2c	○○○
<b>Hardened steels</b> Hardened steels	44–56 HRC	3a	○○○
	57–67 HRC	3b	○○○
<b>Exotic materials</b> Special alloys	< 32 HRC	4a	○○○
	> 32 HRC	4b	○○○
<b>Graphite</b> Industrial graphite		5	○○○
<b>Cast iron</b> Grey / nodular cast iron	< 32 HRC	6a	○○○
	> 32 HRC	6b	○○○
<b>Titanium</b> Titanium alloys	Rm < 600 N/mm <sup>2</sup>	7a	○○○
	600 < Rm N/mm <sup>2</sup>	7b	○○○
<b>Nickel alloys</b> Inconel, Hastelloy	Rm < 1000 N/mm <sup>2</sup>	8a	○○○
	Rm > 1000 N/mm <sup>2</sup>	8b	○○○
<b>Copper, brass, bronze</b> Copper-based	Rm < 850 N/mm <sup>2</sup>	9a	○○○
	Rm > 850 N/mm <sup>2</sup>	9b	○○○
<b>Aluminum</b> Aluminum alloys	Si < 0.5%	10a	○○○
	0.5% < Si < 5%	10b	○○○
	Si > 5%	10c	○○○
<b>Synthetic materials</b> Engineering plastics	Thermoplastic	11a	○○○
	Thermoset	11b	○○○
<b>Composite materials</b> Reinforced composites	Glass fiber / GFK	12a	○○○
	Carbon fiber / KFK	12b	○○○
<b>Precious metals</b> Gold, platinum, silver	Gold	13a	○○○
	Platinum	13b	○○○

## TECHNICAL DRAWING



## DIMENSIONS

### NOMINAL DIMENSIONS

D (0 / -0.01)	13 mm
d (h5)	0 mm
L	-
l1	-
l3	-
d3	-
R	-
e	2.8 mm
Z	-
Chamfer K	-
w° collision	-

