

CRANK POWER
PEAK-POWER IN THE EXTENSOR MUSCLES OF KNEE AND HIP
NON-CIRCULAR CHAINRINGS

source

www.noncircularchainring.be

"Why do appropriate non-circular chainrings yield more crank power...etc"

van Malfait L., Storme G., & Derdeyn M. 2012

pag 32 & pag 43.

code favourable compared to a round chainring
 unfavourable compared to a round chainring

Type non-circular chainring	Ovality	Crank orientation vs major axis (clockwise)	Crank power gain versus round (Watt)			Difference peak-power (Watt) knee-extensor muscles versus round			Difference peak-power (Watt) hip-extensor muscles versus round		
			90 rpm	100 rpm	110 rpm	90 rpm	100 rpm	110 rpm	90 rpm	100 rpm	110 rpm
PowerOval®	25 %	68°	7,0	10,4	15,1	-16,9	-21,9	-28,8	0,0	-2,4	-5,1
Polchlopek	21,5 %	78°	3,7	5,4	7,9	-18,0	-24,6	-33,1	8,5	10,0	10,8
Osymetric	21,5 %	102°	0,3	0,5	0,8	-14,9	-21,6	-30,9	18,1	21,9	26,6
Q-Ring	10 %	106°	-1,2	-1,7	-2,4	-6,4	-9,6	-13,7	11,5	14,2	17,5
Ogival	42,8 %	105°	-3,5	-5,2	-5,1	10,2	11,5	12,8	29,8	44,1	54,5

Comments:

PowerOval®

1. Crank power gain of the PowerOval® non-circular chainring as a percentage of total crank power delivered.

	90 rpm	100 rpm	110 rpm
if 250 Watt crank power	2,8 %	4,2 %	6,0 %
if 300 Watt crank power	2,3 %	3,5 %	5,0 %
if 350 Watt crank power	2,0 %	3,0 %	4,3 %
if 400 Watt crank power	1,7 %	2,6 %	3,8 %

2. Substantially lower peak-load of the extensor muscles of the knee- and hip-joint with PowerOval®

With most of the non-circular chainrings, only the extensors of the knee are unloaded.
 In cycling the extensor muscles are predominantly recruited and provide most of the forward drive (external crank power).
 Any unloading of the extensors is favourable regarding muscle fatigue and allows the cyclist to develop longer a given crank power.