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For the calculation of all spot sizes I have assumed a laser beam of 2mm, an M2 of 1 and an illumination of the whole aperture. So these numbers should be very close the spot sizes our systems are producing

Nd:YAG (1,064 nm) and 10 mm aperture

f = 100 mm: approx. 25 μ m
f = 160 mm: approx. 40 μ m
f = 254 mm: approx. 60 μ m
f = 330 mm: approx. 70 μ m
f = 420 mm: approx. 90 μ m

Nd:YAG (1,064 nm) and 14 mm aperture

f = 100 mm: approx. 20 μ m
f = 160 mm: approx. 30 μ m
f = 254 mm: approx. 40 μ m
f = 330 mm: approx. 50 μ m
f = 420 mm: approx. 70 μ m

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Single element ZnSe flat field objectives for CO2 lasers show some spot variation across the working field. This effect gets smaller with longer focal lengths. Therefore the spot diameters given in the following are average spot sizes. If spot variation across the working field is critical multi-element CO2 objectives can be used.

Co2 (10.6 μm) and 7 mm aperture

f-100 mm: approx 343.2 μm Field size 65mm x 65mm
f-150 mm: approx 472.9 μm Field size 90mm x 90mm
f-200 mm: approx 614.9 μm Field Size 140mm x 140mm
f-300 mm: approx 886.6 μm Field size 195mm x 195mm
f-360 mm: approx 1058.2 μm Field size 250mm x 250mm

CO2 (10.6 μm) and 10 mm aperture

f = 100 mm: approx. 240 μm *Field Size same as above by lens type
f = 150 mm: approx. 330 μm
f = 200 mm: approx. 430 μm
f = 300 mm: approx. 620 μm
f = 360 mm: approx. 740 μm

CO2 (10.6 μm) and 14 mm aperture

f = 100 mm: approx. 200 μm *Field size same as above by lens type
f = 150 mm: approx. 250 μm
f = 200 mm: approx. 320 μm
f = 300 mm: approx. 460 μm
f = 360 mm: approx. 540 μm

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