Design Barrel of Sniper Rifle for low weight

GUN DIET

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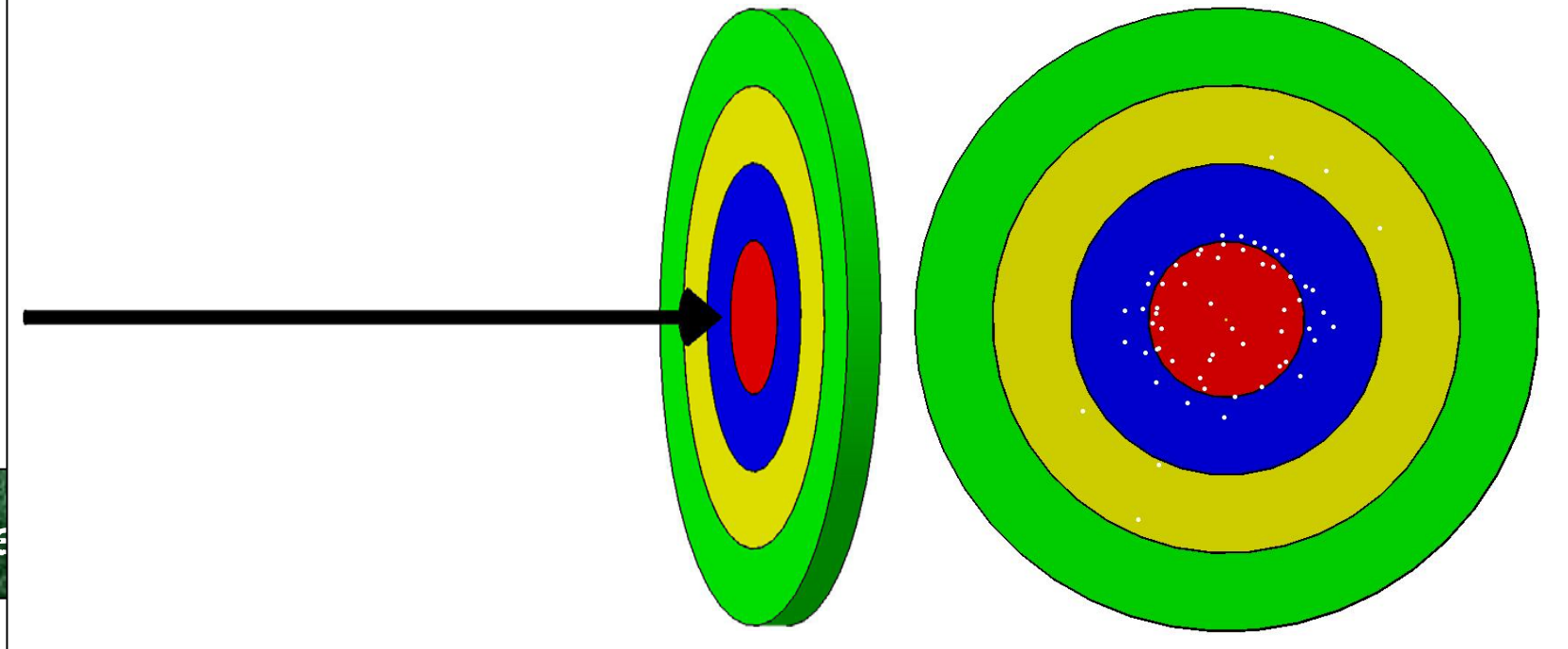
Background

Step 1

- Design Barrel of Sniper rifle for low weight
- 2MOA (minute of angle)
- Safety factor 1.2
- Material must [illegible] transformed by heat



Step

Step2

- Barrel material (rigidity, strength, heat expansion)
- Stress by inner pressure (σ_1=pr/t, σ_2=pr/2t, τ_{max}=pr/2t)

- reference rifle & used bullet
  - AWP (stainless steel, 610mm, 12in/twist, 3.5kg)
  - .308 Winchester Magnum (7.62mm X 66.5mm)

Step3

- Barrel length
- Inch/Helix
  Barrel twist rate
- Outer diameter
- Barrel material

Step4

- Cost function

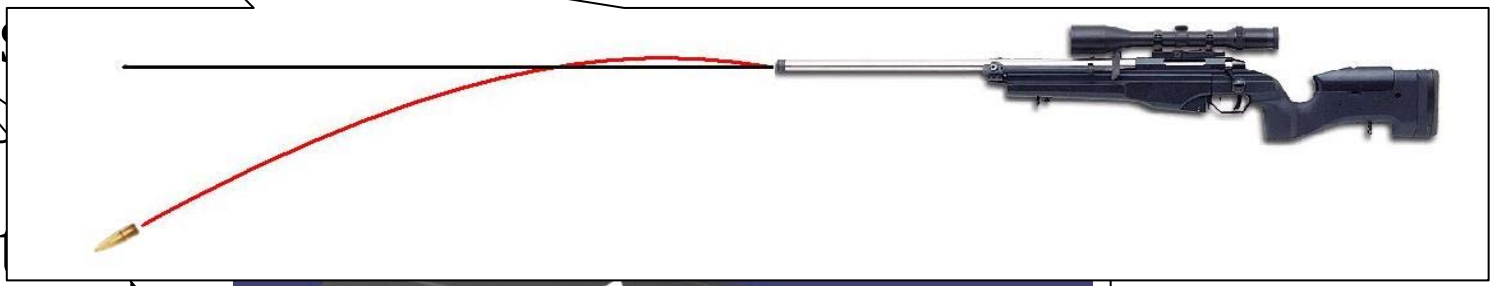
$$M_{barrel} = \rho g(V_{total} - V_{helix})$$

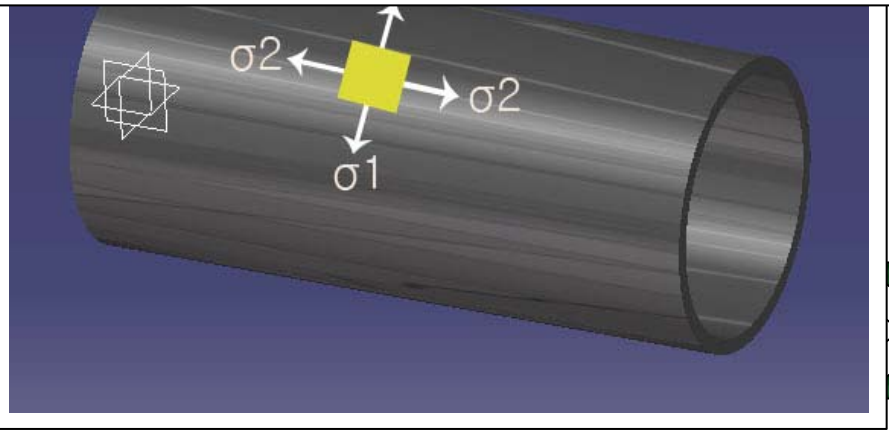
Step5

- Accuracy
  - Satisfy 2MOA
  - Bullet has angular momentum in effective distance
- Stress
  - Stress by inner pressure
  - Stress by direct contact
- Heat expansion

Step5

- Accuracy
  - Chemical energy of gunpowder transforms to kinetic energy of bullet
  - P ∝ 1/x, force , acceleration, velocity calculation
  - $g1=dy-dy_a \leq 0$, $g2=\omega-\omega_a \leq 0$
- Stre
  - g
- Hea
  - g6=f(k)−





Step1 S Step5