Numerical Aperture

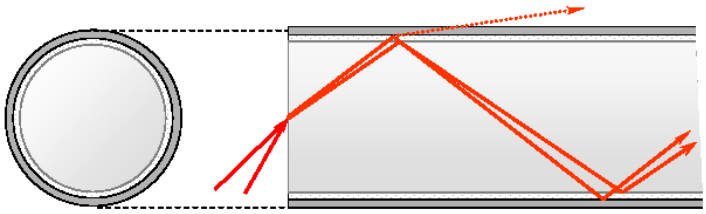
Numerical aperture (NA) is the sine of the critical angle, fiber with a larger numerical aperture requires less precision to splice and align than fiber with a smaller numerical aperture. Theoretical NA is the calculated numerical aperture while Effective NA is the actual numerical aperture that occurs.

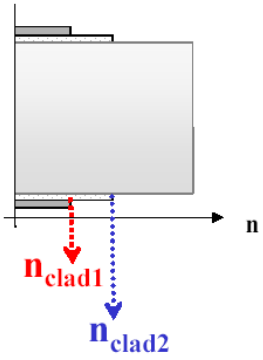
Theoretical NA

- $NA_{th} = (n_{core}^2 - n_{clad}^2)^{(1/2)} = \sin\theta$
  where,
  NA_{th} : Theoretical NA of fiber
  n_{core} : Refractive index of Core
  n_{clad} : Refractive index of Cladding
- eg. $NA = (n_{core}^2 - n_{clad}^2)^{(1/2)} = (1.492^2 - 1.402^2)^{(1/2)} \cong 0.5$

Effective NA

- FFP (Far field pattern) method is defined in IEC and other standards, and one of the procedure which can provide effective NA (= Mitsubishi's internal procedure).





- Theoretical NA may be defined as,
  - $NA_{th} = (n_{core}^2 - n_{clad1}^2)^{(1/2)}$
  - $NA_{th} = (n_{core}^2 - n_{clad2}^2)^{(1/2)}$