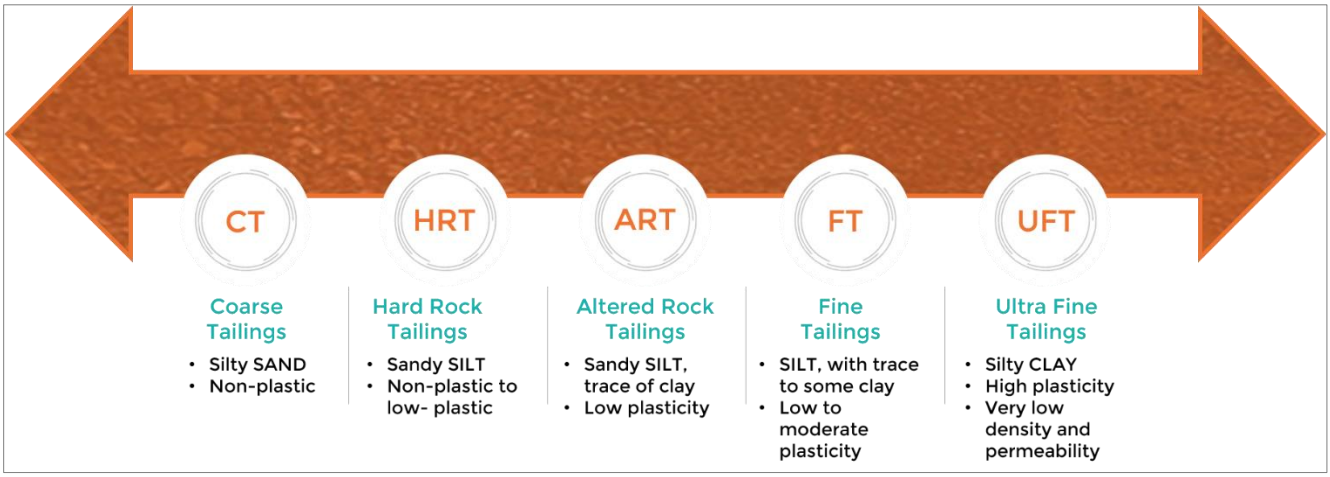
Study Summary

Tailings Properties and Tailings Technologies

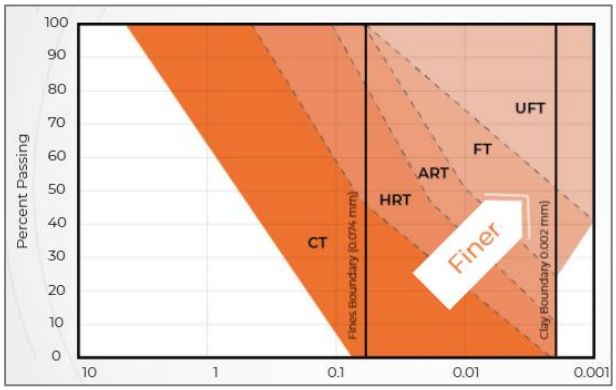
ICOLD Tailings Classifications



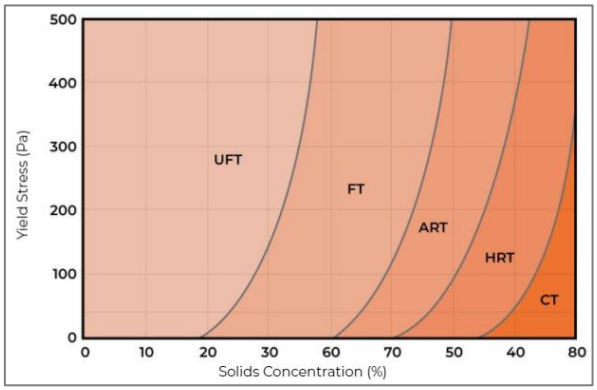
Density	$Density\ (\rho) = \frac{Mass\ _{(Soil)}}{Volume\ _{(Soil+Water)}}$
Specific Gravity	$Specific\ Gravity = \frac{Density_{(Material)}}{Density_{(Water)}}$
Void Ratio	$Void\ Ratio\ (e) = \frac{Volume\ _{(Voids\ or\ Water)}}{Volume\ _{(Soil)}}$
Settled Density (Solids Concentration)	$\%solids = \frac{Weight_{(Solids)}}{Weight_{(water)} + Weight_{(Solids)})}$
Void Ratio	$Void\ Ratio = Specific\ Gravity \times \frac{(1 - \%solids)}{\%solids}$
Slurry Density	$Slurry\ Density = \frac{Weight_{(Water)} + Weight_{(Tailings)}}{Volume_{(Slurry)}}$
Percent Solids by Weight	$Percent\ Solids\ by\ Weight = \frac{Weight_{(Solids)}}{Weight_{(Solids)} + Weight_{(Water)}}$
Dry Density	$Dry\ Density = \frac{Specific\ Gravity}{1 + Void\ Ratio} \times Density\ of\ Water\ (9.984\ kN/m^3)$

Overconsolidation Ratio (OCR)	$$OCR = \frac{Historical\ Load}{Normal\ Overburden\ Load}$$
Plasticity Index	$$Plasticity\ Index = Liquid\ Limit - Plastic\ Limit$$
Liquidity Index	$$Liquidity\ Index = \frac{Water\ Content - Plastic\ Limit}{Plasticity\ Index}$$
Neutralization Potential Ratio (NPR)	$$NPR = \frac{Neutralization\ Potential}{Acid\ Production\ Potential}$$

Gradation of Tailings Types



Yield Stress and Solids Concentrations



Dewatering Continuum

Tailings Technologies