phaseTwo_EN6892018.R

DErr001

2025-02-12

Phase 2, BOHS/NVvA & EN689 2018 - U test

Mann-Whitney U test (70% Confidence) is operated to evaluate SEG compliance based on the number of measurements performed. If the U value calculated (pg. 42, EN689 2018) is greater than U threshold established in the Mann-Whitney U table, there is Compliance, differently, if the U value is lower, there is Non-Compliance. The U-thresholds integrated in the function are for a maximum of 15 measurements per SEG.

@param samples measurements of the SEG under assessment from 6 to 15 @param OEL Exposure Limit of the agent @return U value > ("Not Compliant") or < ("Compliant") U thresholds @export

```
phase2_Uvalue <- function(samples, OEL) {
  if (length(samples) < 6) {
    stop("Error: At least 6 measurements are required.")
  }
  # Calculate U-value
  U <- (log(OEL) - log(geomean(samples))) / log(geosd(samples))

  # Define threshold values based on the number of samples
  thresholds <- c(2.005, 2.035, 2.072, 2.120, 2.187)
  threshold <- thresholds[min(length(samples), length(thresholds))]

  # Check compliance
  compliance <-
  if (U < threshold) {
    result <- "Compliant"
  } else {
    result <- "Not Compliant"
  }

  return(result)
}
```

Phase 2, EN689 2018 - UTLv (Upper Tolerance Limit value), 95% CI, 70% CL

The test is based on the comparison of the UTLv having 95% P.C. with 70% Confidence Level with the OEL. If the UTL is greater than OEL, there is exceedance and so Non-Compliance of your measured exposures. Contrarily, if the UTL is lower than OEL, the probability of exceedance is acceptable, so there is Compliance of your measured exposures.

@param samples at least 6 measurements of the SEG under assessment @param OEL Occupational Exposure Limit of the agent @return UTL > OEL ("Not Compliant") or UTL < OEL ("Compliant") @export

```
phase2_UTL <- function(samples, OEL) {
  if (length(samples) < 6) {
    stop("Error: At least 6 measurements are required.")
```

```
  }
  # Calculate upper tolerance limit (UTL)
  TL <- normtol.int(log(samples), alpha = 0.3, P = 0.95, side = 1)
  UTL <- exp(TL$`1-sided.upper`)

  # Check compliance
  compliance <-
  if(UTL < OEL) {
      result = "Compliant"
      }
  else {
        result = "Not Compliant"
    }

  return(result)
}
```