RESIL
Science For Change

TECHNICAL TUESDAYS

TOPIC: Dry Cleaning of Textile with Different solvents

REF: TT/ June 2016/ WK 3

What is Dry Cleaning?

- Dry cleaning is any cleaning process for clothing and textiles using a chemical solvent other than water.

Need for Dry Cleaning?

- It is used to clean delicate fabrics that cannot withstand rough conditions and tumble of a washing machine and clothes dryer.
- Garments or textiles made of wool and silk are mostly dry cleaned.

Solvents used:

1) **Perchloroethylene (tetrachloroethylene)**: Commonly termed "Perc", it is the most common solvent. It is an aggressive cleaner that yields better results on oil-based stains than water-soluble stains (coffee, wine, blood, etc.). Known for its characteristic chemical smell on garments, Perc is non-flammable. Its popularity is reducing due to its ground contamination problems and potential health effects.

   Advantages:
   a) Cost effective and non-flammable
   b) High evaporation rate prevents solvent residue after cleaning on garments

2) **Hydrocarbons :** These petroleum-based solvents are less aggressive than Perc and require a longer cleaning cycle. Although combustible, these solvents do not present a high risk of fire or explosion when used properly. Hydrocarbons also contains volatile organic compounds (VOCs) that contribute to smog.

   Advantages:
   a) The hydrocarbon solvents used today, having high purity, are completely safe for the environment.
   b) Clothes will have a fresh, clean scent rather than the unpleasant chemical smell of clothing cleaned with Perc.

3) **Brominated solvents:** n-Propyl bromide is a solvent with a higher KB-value (Kauri-butanol value) than Perc. This allows it to clean faster, but it can damage some synthetic beads and sequins if not used correctly. It is among the more expensive solvents, but due its faster cleaning, lower temperatures, and quick drying properties, it's considered to bear the same or lower costs across the process.

   Advantages:
   a) Bromines are more oil soluble than Chlorine
   b) ***nPB (n-Propyl Bromide)*** is softer on fabric and requires less energy to heat.

4) **Glycol Ethers (dipropylene glycol tertiary-butyl ether)** are an environmentally friendly alternative to Perc with processing advantages. Lower cycle times, with reduced detergent provides better cleaning than the long-standing leader, Perc.

Advantages:

a) Effective on water and oil-based stains and safer on most fabrics
b) All Propylene-based GE's are currently believed to be relatively safe.
c) Most Ethylene-based GE's with 'Methyl' in their names are relatively more toxic.

Reference:

i) https://www.google.co.in/#safe=strict&q=advantages+of+hydrocarbon+solvents

ii) http://cleaner-and-launderer.com/cleaning-textiles-with-hydrocarbon-solvents-part- two-everett-childers/

iii) https://books.google.co.in/books?id=CD6kqBW5U_wC&pg=PA167&lpg=PA167&dq=advantages+of+brominated+solvent+for+dry+cleaning&source=bl&ots=h3I237M0VU&sig=SX5qCLNnT_ENhRxeiZJjMLGhHaI&hl=en&sa=X&ved=0ahUKEwirysW-qbjNAhWMr48KHfsWBVgQ6AEIJDAC#v=onepage&q=advantages%20of%20brominated%20solvent%20for%20dry%20cleaning&f=false

iv) http://www.ecomall.com/greenshopping/dryclea2.htm

Have a great week ahead!