Hand Cleaning

A human centric/ earth aware challenge

Ergo Background

- Hand Rollers fail to incorporate contemporary thinking regarding Ergonomics
  - As a result most could contribute to Musculoskeletal disorder (MSD) called Repetitive Strain Injury (RSI)
  - Poorly designed product also reduces productivity
  - Handle that causes discomfort can also lead to ineffective cleaning as the operator fails to clean whole surface

Eco Background

- Hand Rollers fail to consider whole life implications with regard to the environment and health
  - Plastics, plastic coated metals, elastomers are commonly used. This makes the product extremely difficult to recycle/reuse
  - Materials used in many rollers include those which are deemed SVHC under the REACH directive. Many low cost silicone elastomers use silicone oils and cyclic silicones which leach from the material. These present health issue to workers and affect disposal. Many Asian suppliers do not declare these chemicals

Design Challenges

Ergo – Human Centric

- Must use best practise as per ***Cutkosky***[1] Grip Taxonomy, and ***Hokari***[2] Grip Shape guidance
- Formed to fit the hand – there are no straight lines on the hand.
- High levels of comfort, with good grip. No pressure points

Eco – Earth Aware

- Use materials which are long lasting
- Use materials which are easy to recycle
- Use materials for which there is a well defined recycling process in all countries
- As little material as possible
- Eliminate all harmful materials

teknek

An ITW Company

Teknek
TEK-HR

The New TEK-HR

Innovation

- Ergonomic design effective for all hand sizes and shapes to reduce RSI (repetitive strain injury) – uses best practise to make human centric handle/system
- Ecological approach, the handle system is the most easily recyclable available, and longest lasting, using as few resources as possible during manufacture. No harmful materials

The New TEK-HR

Value

- Best cleaning performance – supported by test data
- Value Engineering – handle system achieves all design goals whilst reducing production costs

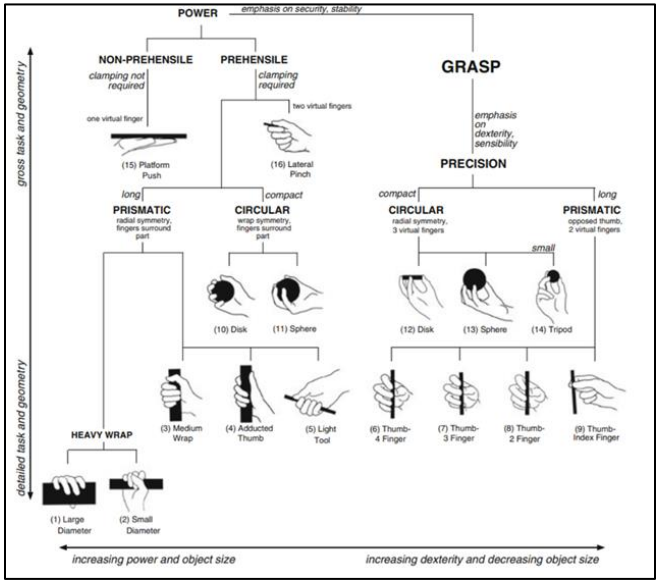
Experience

- Teknek hand rollers – used by Security Lamination, Electronics Assembly, Medical packaging, Glass manufacture and many others

Knowledge

- Proven production processes - over 15,000 cleaning rollers each year - All comply with ISO 6123 Class A
- Experts in substrate cleaning and yield improvement initiatives in multiple industries

TEK-HR – Ergonomics



- Hand rollers require excellent ergonomics as they are often held for long periods. Uses Cutkosky[1] Grip Taxonomy
- The size of the handle and weight and balance of the hand roller was also carefully design to reduce strain for all hand types.

- Uses recent research by Hokari[2] to reduce pressure points and grip comfort. Final design fits the ‘palmer’ area well.
- Novel design reduces mass reducing load on operator

TEK-HR – Ergonomics

- A poorly designed hand tool can lead to a Musculoskeletal disorder (MSD) called Repetitive Strain Injury (RSI)
- It is estimated that in the UK alone Repetitive Strain Injuries cost employers £300-million per year in lost working time, sick pay and administration
- In many countries assessing MSD risk is a key part of a company wide risk assessment.
- Ergo design aligns with Thales HSE strategy and deployment of the OHSAS 18001 safety management system and commitment to reduce injury and accident frequencies yearly at all sites.

TEK-HR – Ecological

- Aluminium handle suited for repeated recycling – circular economy
- Lightweight but robust and comfortable, investment in die casting tooling eliminates machining hence reducing usage. Can use recycled material
- Increased service life
- Aligns with Thales Corporate Responsibility Statement and ISO14001 certification to reduce emissions and waste.

  “With purchases making up nearly half of Thales’s revenues, obtaining supplier agreement to meet the environmental requirements of our Purchasing & Corporate Responsibility Charter is an essential part of the Group’s overall approach.”

TEK-HR – safety

- All metal – except roller covering
- No coatings, no paint
- All safe materials
  - No SVHC materials
  - Halide Free
  - No VOC (Volatile Organic Compound)

References

- 1. **Cutkosky, M.R**. IEEE TRANSACTIONS ON ROBOTICS AND AUTOMATION, VOL. 5, NO. 3. JUNE 1989. *On Grasp Choice, Grasp Models, and the Design of Hands for Manufacturing Tasks*

- 2 **Hokari, K., Pradudita, J., Ito, M., Noda, S. and Tanabe, Y.,** International Journal of Industrial Ergonomics, Volume 70, March 2019, Pages 84 -91. *The Relationships of Gripping Comfort to Contact Pressure and Hand Posture During Gripping.*