PURCHASE A HEAT SEALER

The right test for the right choice

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Goal

- Henri Mondor central service
  - 200,000 double packing pouches produced annually
  - Equipment park: 8 rotary sealers (9 to 13 years old)
    - Difficulties of peelability reported by OR nurses (defibration and tearing of the paper)

- Replacement in 2009
  - Public procurement procedure
    - 5 models purposed

- goal: to Determine pertinent judgment criteria to select powerful models
Judgment criteria

Two types:

Subjective criteria:
- Appreciation of the users: presentation, ergonomics

Objective criteria:
- Technical characteristics
  - Conformity with contract formulary
  - Regulation and warning systems (alarms)
  - Electric consumption – automatic stand-by function
- Standard conformity
  - Technical tests

Comfort of use

Performance
How to evaluate performance?

- By testing the physical parameters?

- Temperature of the heating irons
  - Measuring at one point (regulation probe)
  - Measuring along the irons

- Drive speed
  - Tachymeter

- Crushing pressure
  - Dynamometric sensor

*Not available for our tests*
How to evaluate performance?

- By testing the sealing performance?
  - Manual evaluation of peal ability
    - EN 868-5 (appendix C)
  - Paper sheet sealing test
    - Seal Control ENTHRAL MEDICAL®
  - Dynamometric strength test of the seams
    - EN 868-5 (appendix D)
    - Peel Test HAWO® Hawotest ht150SCD
How to evaluate performance?

- **Determination of seam strength** *(EN 868-5:1999)*
  - Using a dynamometer HAWO Hawotest ht 150 SCD (Peel Test)
    - Cutting guide for the preparation of 15mm width seam samples
    - Constant traction speed 200 mm/min
    - PC-software integration and analyse of the results
Results of our evaluation

✓ Evaluation by the users

✓ 4 sealers appreciated

✓ More appreciated characteristics:
  ✓ Compactness and lightness of smaller models
  ✓ Front smooth tables (vs roller tables)

✓ Less appreciated characteristic
  ✓ Heavy and massive models
  ✓ Automatic stand-by function (energy saving) because of warm-up delay before starting
  ✓ One model that makes folds when introducing the pouches
Results of our evaluation

✓ Temperature of the heating irons
  ✓ Temperature measured close to the machine probe versus along the heating irons (each 2 cm)

✓ Temperature measured close to machine probe was conform with temperature displayed on the screen

180 ± 1°C
Results of our evaluation

✓ Determination of seam strength (EN 868-5:1999)
  ✓ The width of all the seam samples was over 6mm (from 12 to 15 mm)
  ✓ The maximal strength of all the seam samples was over 1.5 N / 15 mm (1.7 to 12.2 N)

✓ However, two models were rejected:
Results of our evaluation

✓ First rejected model:
  ✓ Opening resistance of the seam were very high
  ✓ Maximum strength from 9.4 to 12.2 N / 15 mm after steam sterilisation
  ✓ Manual peal ability was difficult
  ✓ Tearing and delamination of the paper face
Results of our evaluation

- Second rejected model:
  - Manual peel ability was correct (no tearing)
  - Seam strength was borderline regarding to the standard
    - Max strength from 1.7 to 4.1 N / 15 mm after autoclaving
    - The strength was > 1.5 N only along 9 to 60 % of the seam width (1.2 to 7.8 mm regarding to a total of 13 mm)
Control of the physical parameters

- Temperature of the heating irons
  - Instant temperature: no interest
  - Iterative measurements: to detect a drift (close to the regulation probe)

- Drive speed
  - No interest (minor risk of drift)

- Crushing pressure
  - Difficult to realise
  - No detection of the problems of rollers parallelism

Validation of performance

Testing the quality of the seam
Discussion

• Benefits of the dynamometric test
  • Evaluation by the users is not discriminating, compared with the performance tests, especially the dynamometric test.
  • The paper sheet sealing tests (as Seal Control® or Seal Check®) are helpful to detect major defaults of the heat sealer
    • Major temperature or pressure drifts
    • Punctual defaults of the seam (rollers deformed by the intrusion of an instrument)
  • The dynamometric test is the only test that validate sealing performance in a quantitative way.
  • global performance of the sealer (combination pouch/temperature/pressure/speed)
Conclusion

✓ Our tests leads us to retain three suppliers among the five models purposed. In a second time, the choice was made, considering the price and optional functions and accessories.
  ✓ Information printing on the pouches
  ✓ Supervision system for sealing parameters

✓ Installation of the new sealers
  → Validation of the sealing process (couple pouch/sealer) according to EN 868-5
  → dynamometric test systemised

✓ WFHSS Guideline for the Validation of the sealing process according to EN ISO 11607-2 (Central Service 2008/6)
Thank you for your attention

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