

**Of 1000 stacked packs outside,
no one shall leak.**

Task

Manufacturers of petrochemical materials are especially anxious regarding the load security of their products which tolerate no leakage.

**Of 1000 stacked packs outside,
no one shall leak.**

**For perfect stacking, potentially disruptive edges
on the film roof should be reduced to a minimum size.**

These two requirements are contradictory. Perfect tightness requires low stress on the weld-seam. A flat film roof and optimum appearance can be achieved by, among others, high weld-seam stress.



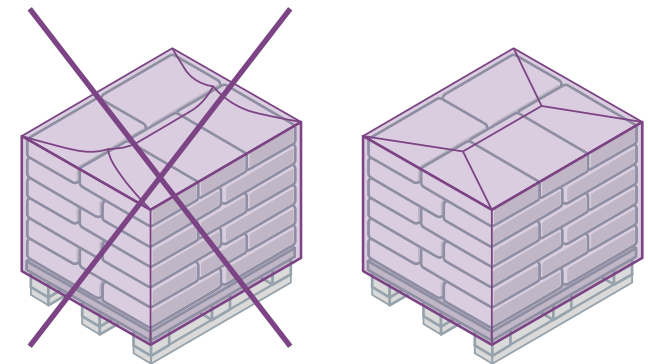
Perfect load securing for outside-storage.

Solution

A new developed film feed welding device.

The roof tension is decisive for the formation of protruding film edges – the higher this tension the flatter the roof.

Flat roofs however ensure secure stacking during transport and transfer in warehouses and outdoors – saving customers valuable time and prevents transport damage such as leaks.



Conclusion

- safer storage outside at all locations
- best possible protection for the product against external elements
- perfect appearance for the customer's product

Test series

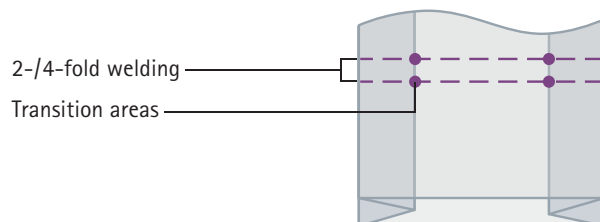
The tests were performed in a test series on the HSA-Vario coordinate machine of the Möllers Group Academy, at the customer's premises and in collaboration with original film manufacturer.



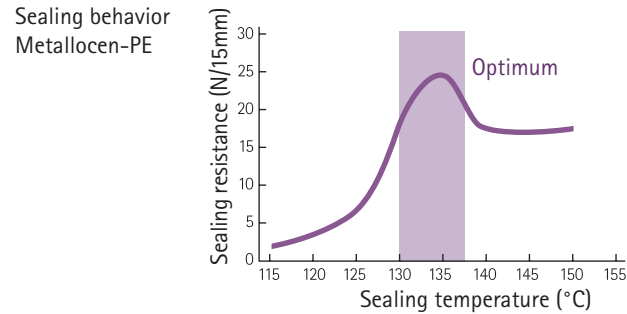
The following areas were examined:

1. Changes in weld strip construction
2. Optimized process flow
3. Adjustment of the stretch curve
4. Determining the optimal film for the customer

Our theoretical considerations have been confirmed by laboratory examinations and analyses of the weld-seams of various film suppliers and machine parameters: weak point is the transition area between 2-fold and 4-fold welding. For when forming the hood, the seam in the gusset area is welded 4-fold.



The machine settings were specifically examined, adjusted and optimized with regard to the three main influencing parameters pressure, time and temperature on the seal-seam strength.



Frequently block layering is employed outside whereby the packs are stacked directly on top of one another.



Consequently, the inclusion of the uppermost pack by the forklift carries the risk of piercing the respective inner edges of the lower stack.

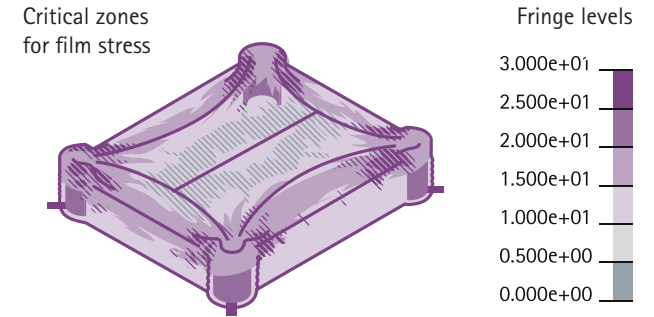
In addition, when transporting on open trucks, the wind created during the journey poses the threat of damage to the protective film – which entails ingress of moisture.

1. Changes in weld strip construction

The design of the weld strip has been adapted to reduce pressure uniformly over the entire length of the film during welding.

2. Optimized process flow

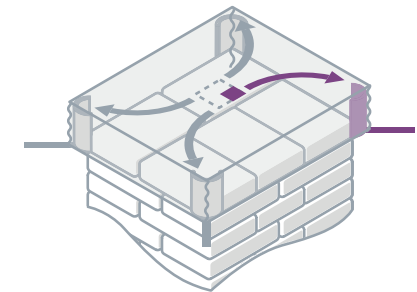
As part of the optimized process, quality is enhanced by active cooling immediately after the welding process – with simultaneous maximum welding tightness.



3. Adjustment of the stretch curve

The optimum stretch point is approached either linearly or response curve. The HSA-Vario is doubly flexible: thanks to optimum selection and adjustment of hose variant to pallet size.

In sum, the required reduction in the edges is recruited from the optimal stretch parameters obtained in the research.



4. Determining the optimal film for the customer

Taken for granted by the Möllers Group Academy team: there the ideal film is identified for the respective product – they respond to the stringent requirements regarding economy and security.