

- 1) Polypropylene is used for pallet strapping to keep contents tightly secured to the pallet during to shipment. Long-term warehouse storage tests have found that tensile stress in polypropylene straps drops to 10% of its initial value after 1 year. Estimate how many days it will take for the stress to drop to 50% of its original value. Assume that polypropylene behaves as a Maxwell solid and that temperature in the warehouse remains constant over a year. Hint: you will need to find a value for E/η .



Figure 1. Picture of a pallet strapping machine (blue). Yellow straps are made from polypropylene and used to secure the cardboard box to the wooden pallet at the bottom.

- 2) Dowling, Problem 13.10 (a). Figure 13.9 (a) is an example plot of the stress distribution versus distance y at the maximum moment. Figure 13.9 (c) is an example plot of the residual stresses versus the distance y .