

$$\text{Costo} = \text{PVa} \cdot \text{Costo/Anno (a rate costanti)}$$

$$\lambda = \frac{1}{\text{MTTF}} \left[\frac{\text{guasti}}{h} \right]$$

$$R = e^{-\lambda t}$$

$$\text{MTTF} = \frac{N_g(t_g)^* t_g}{\sum N_g}$$

$$\text{MTTR} = \frac{1}{\mu} \text{ (tempo di riparo)}$$

$$A = \frac{\mu}{\mu + \lambda} = \frac{\text{MTTF}}{\text{MTTF} + \text{MTTR}}$$

$$R_{\text{serie}} = \prod_i R_i$$

$$A_{\text{serie}} = \prod_i A_i$$

$$R_{\text{par}} = 1 - \prod_i [1 - R_i]$$

$$A_{\text{par}} = 1 - \prod_i [1 - A_i]$$

$$\frac{k}{n} \rightarrow \text{somma probabilità del funzionamento di k su n}$$

$$C = C_0 \left(\frac{P}{P_0} \right)^m$$

Dimensionamento accumulatore:

$$R(t) \rightarrow R_{\text{cum}}(t) \rightarrow P_{\text{med}} \rightarrow P_{\text{cum}} \rightarrow \Delta V = P_{\text{cum}}(t) - R_{\text{cum}}(t) \rightarrow V_{\text{serb}} = \Delta V_{\text{max}} - \Delta V_{\text{min}}$$

$$V_0 = -\Delta V_{\text{max}}$$

Material Handling:

$$P \left[\frac{UdC}{t_{\text{ciclo}}} \right] = \frac{Q \left[\frac{UdC}{\text{ciclo}} \right]}{T_c \left[\frac{\text{tempo}}{\text{ciclo}} \right]}$$

$$T_{\text{ciclo}} = T_{\text{var}} + T_{\text{fisso}}$$

$$T_{\text{var}} = t_{\text{mov}} \text{ orizzontale} + t_{\text{mov}} \text{ verticale}$$

$$T_{\text{fisso}} = \text{tempo curve} + \text{tempo carico/scarico etc.}$$

$$PM_{car} = \frac{FU}{T_{ciclo}}$$

$$N. carr = \frac{PM_{richiesto}}{PM_{carr}}$$

$$P = \frac{Q \cdot V}{d} \rightarrow d = \text{dist.media tra pacchi}$$

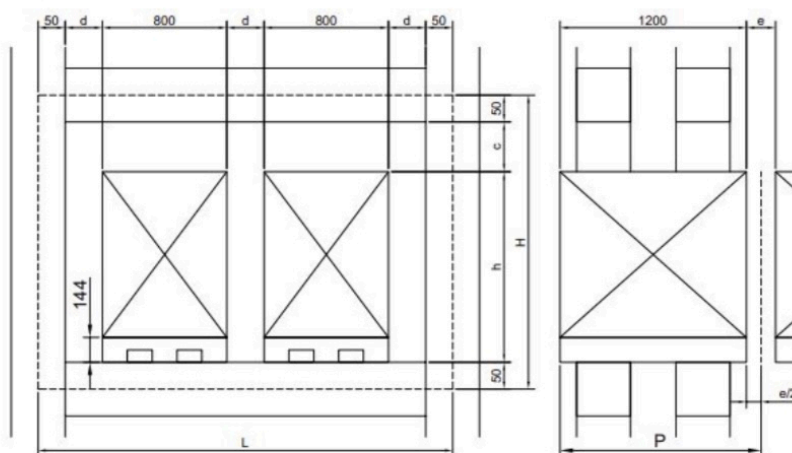


Figura 5.4: Cella di stoccaggio per 2 Europallet a singola profondità

$c=100\div150$ mm $d=75\div150$ mm $e=200\div300$ mm $H=900-1200-1500-1800-2100-2400$ mm

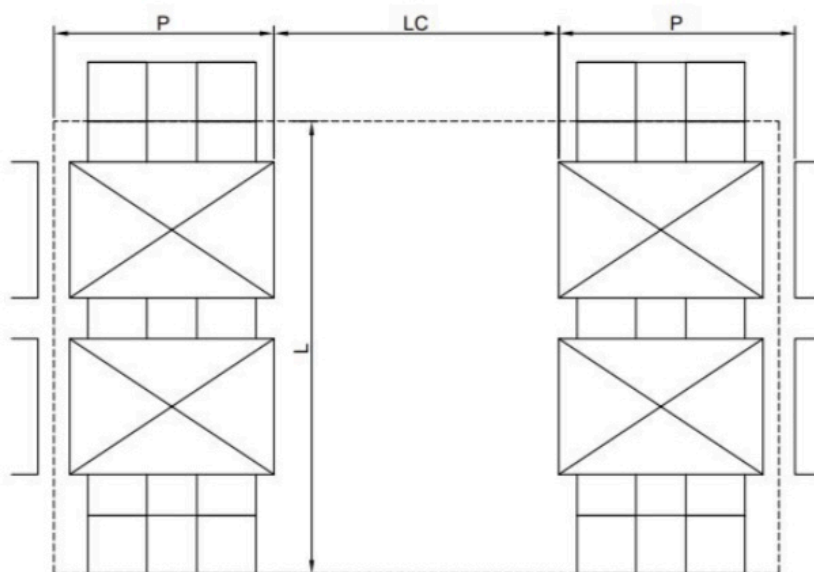


Figura 5.5: Modulo unitario per celle di 2 Europallet a singola profondità

$$A_{modulo\ unitario} [m^2] = L \cdot (LC + 2 \cdot P)$$