

# 제 14 장

문제 1, 2 은 제 14장 본문참조

문제 3 풀이

$$G_r = \frac{\Lambda_w}{\Lambda_t} = \frac{Z_w / F_t}{Z_t / F_t} = \frac{Z_w}{Z_t}$$

$$\begin{aligned} \therefore Z_t &= \frac{Z_w}{G_r} = \frac{l \cdot A_p \cdot h/t}{G_r} \\ &= \frac{A_p \times 0.5 \times 0.5/t}{30 \text{ p.m}^3/\text{cm} / 20 \text{ p.m}^3/\text{cm}} \end{aligned}$$

$$\begin{aligned} \text{숫돌 마모량} &= Z_t \cdot t = \frac{A_p \times 0.5 \times 0.5}{50/20} \\ &= \frac{A_p \times 0.5 \times 0.5}{2.5} = \frac{\pi}{4} (d_1^2 - d_2^2) \cdot A_p \end{aligned}$$

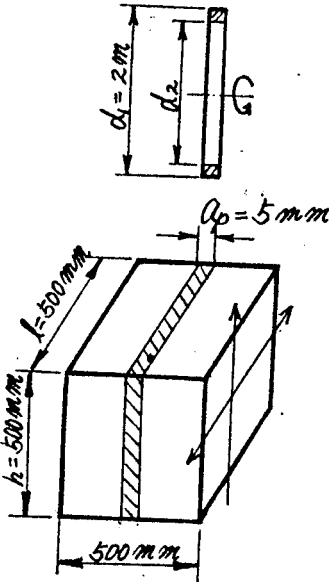
단,  $d_1$  : 숫돌의 초기직경 = 2m  
 $d_2$  : 숫돌의 최후직경

$$\frac{0.5 \times 0.5}{2.5} = \frac{\pi}{4} (d_1^2 - d_2^2)$$

$$\therefore d_2 = \sqrt{4 - \frac{4}{\pi} \times \frac{0.5 \times 0.5}{2.5}} = 1.968 \text{ m}$$

$$\begin{aligned} \therefore \text{숫돌 반경의 변화량} &= \frac{d_1}{2} - \frac{d_2}{2} = \frac{2}{2} - \frac{1.968}{2} \\ &\doteq 16 \text{ mm} \end{aligned}$$

$$\text{필요의 총이송량} = h + 16 = 500 + 16 = 516 \text{ mm}$$



$$\text{연삭 행정수} = \frac{516 \text{ mm}}{2 \text{ mm/stroke}} = 258 \text{ strokes}$$

$$\text{가공시간 } t_m = \frac{258 \text{ strokes}}{0.2 \text{ stroke/sec}} = 1290 \text{ sec}$$

$$\text{실제 이송량 } f = \left( \frac{300}{516} \right) \times 2 \text{ mm/stroke} = 1.938 \text{ mm/stroke}$$

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$$\begin{aligned} \therefore Z_w &= A_p \cdot f \cdot V_{\text{trav}} = (5 \times 10^{-3}) \times (1.938 \times 10^{-3}) \times (150 \times 10^3) \\ &= \underbrace{\Delta w}_{50 \times 10^{-2}} (F_t - \underbrace{F_{t_0}}_{900 \text{ N}}) \end{aligned}$$

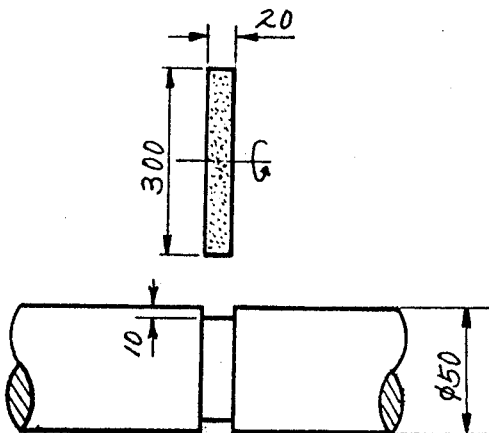
$$\therefore F_t = \frac{1.454 \times 10^{-6}}{50 \times 10^{-2}} + 900 \approx 30000 \text{ N}$$

[답]

$$t_m = 1290 \text{ sec}$$

$$F_t \approx 30000 \text{ N}$$

문제 4 풀이



$$\begin{aligned} d_e &= \frac{d_t}{1 + d_t/d_w} \\ &= \frac{300}{1 + \frac{300}{50}} \\ &= 42.86 \text{ mm} \\ &= 0.04286 \text{ m} \end{aligned}$$

