Exstrusion loss

Extrusion time	$t_{ext} := 4s$
Pelletizer's power	$N_{pel} := 7.5kW$
Выделяемое тепло при экструзии	$Q_{heat\_ext} := N_{pel} \cdot t_{ext} = 30000\,J$
Heat generated during extrusion	$G_{pell} := 120\,\frac{kg}{hr}$
Time of one cycle	$t_{cycle} := 24s$
Mass of pellets produced in one cycle	$m_{pellets} := G_{pell} \cdot t_{cycle} = 0.8\,kg$
Specific heat of evaporation (sublimation)	$k_{sub} := 590000 \cdot \frac{J}{kg}$
Mass of evaporated dry ice from heat per cycle	$m_{sub} := \frac{Q_{heat\_ext}}{k_{sub}} = 0.051\,kg$
Percentage of evaporated ice by mass of ice per cycle	$\chi := \frac{m_{sub}}{m_{pellets}} = 6.4 \cdot \%$
Mass of ice evaporated in an hour of work	$G_{sub} := \frac{m_{sub}}{t_{cycle}} = 7.6 \cdot \frac{kg}{hr}$
Weight of ice for 220 days for 5 hours of operation	$m_{DI220\_5} := G_{sub} \cdot 5hr \cdot 220 = 8390\,kg$

Cooling loss

Weight of the pressing block	$m_{block} := 130kg$
Heat capacity of steel	$c_{st} := 460 \cdot \frac{J}{kg \cdot K}$
Cooling temperature difference	$\Delta T := 100K$
The cold required for cooling the pressing block	$Q_{cool} := m_{block} \cdot c_{st} \cdot \Delta T = 5980000\,J$
The mass of ice required for cooling the block	$m_{DI} := \frac{Q_{cool}}{k_{sub}} = 10\,kg$
Dry ice mass loss in 220 days (220 launches)	$m_{DI220} := m_{DI} \cdot 220 = 2230\,kg$