

Variable	Published Units	Converted Units	Updated Value	Reference
$\rho$	$g\ cm^{-3}$	$kg\ m^{-3}$	–	Barnola (1991) [2]
$A_0$	$MPa^{-3}s^{-1}$	$Pa^{-3}s^{-1}$	$2.45 \cdot 10^{-14}$	
$\lambda$	$g\ cm^{-2}year^{-1}$	$kg\ m^{-2}s^{-1}$	–	
$T$	$K$	$K$	–	
$k$	–	–	–	
$Q$	$KJ\ mol^{-1}$	$J\ mol^{-1}$	$6.0 \cdot 10^4$	
$R$	$KJ\ mol^{-1}K^{-1}$	$J\ mol^{-1}K^{-1}$	$8.3145 \cdot 10^4$	
$f$	–	–	–	
$\alpha$	$cm^9g^{-3}$	$m^9kg^{-3}$	$-3.7455 \cdot 10^{-8}$	
$\beta$	$cm^6g^{-2}$	$m^6kg^{-2}$	$9.9743 \cdot 10^{-5}$	
$\delta$	$cm^3g^{-1}$	$m^3kg^{-1}$	$-9.5027 \cdot 10^{-2}$	
$\gamma$	–	–	30.673	
$P$	$MPa$	$Pa$	–	
$n$	–	–	3	
$h$	$m$	$m$	–	
$t$	$year$	$s$	–	
$Age$	$Kyr\ BP$	–	–	
$V_i$	$cm^3g^{-1}$	$m^3kg^{-1}$	–	Arnaud (2000) [1]
$T$	$K\ or\ ^\circ C$	$K$	–	
$Z_0$	–	–	–	
$\rho\ (density)$	$g\ cm^{-3}$	$kg\ m^{-3}$	–	
$P_{eff}$	$MPa$	$Pa$	–	
$v$	0	$kg\ s^{-1}m^{-1}$	–	
$R\ (grain\ radii)$	0	$m$	–	
$r$	0	$m$	–	
$\gamma$	0	$s\ kg^{-1}$	–	
$Age$	$year$	$s$	–	
$\dot{\epsilon}$	$s^{-1}$	$s^{-1}$	–	
$\sigma$	$MPa$	$Pa$	–	
$A$	$MPa^{-3}s^{-1}$	$Pa^{-3}s^{-1}$	$7.89 \cdot 10^{-15}$	
$Q$	$KJ\ mol^{-1}$	$J\ mol^{-1}$	$6.0 \cdot 10^4$	
$R\ (gas\ constant)$	$KJ\ mol^{-1}K^{-1}$	$J\ mol^{-1}K^{-1}$	$8.3145 \cdot 10^4$	
$D$	–	–	–	
$t$	0	0	–	
$a$	–	$m^2$	–	
$P^*$	$kPa\ or\ MPa$	$Pa$	–	
$f(D)$	–	–	–	
$n$	–	–	–	
$temp_{mean}$	$^\circ C$	$K$	–	
$a_c$	$g\ m^{-2}yr^{-1}$	$kg\ m^{-2}s^{-1}$	–	
$load\ pressure$	$Mg\ m^{-3}$	$kg\ m^{-3}$	–	
$depth$	$m$	$m$	–	

$\beta$	–	–	–	H & L (1980) [4]
$S_v$	0	$m^2$	–	
$G(r)$	0	0	–	
$\rho$	$Mg\ m^{-3}$	$kg\ m^{-3}$	–	
$A(accum.\ rt.)$	$m\ yr^{-1}$	$m\ s^{-1}$	–	
$temp$	$^{\circ}C$	$K$	–	
$C$	0	0	–	
$C'$	0	0	–	
$a$	–	–	–	
$b$	–	–	–	
$k$	0	0	–	
$Z_0$	0	0	–	
$\rho$	$g\ cm^{-3}$	$kg\ m^{-3}$	–	Goujon (2003) [3]
$V_c$	0	$m^3$	–	
$D$	–	–	–	
$T_s$	$K$	$K$	–	
$u, v, w$	0	$m\ s^{-1}$	–	
$Q$	$W\ m^{-3}$	$W\ m^{-3}$	–	
$K$	$W\ m^{-1}K^{-1}$	$W\ m^{-1}K^{-1}$	–	
$c$	$J\ K^{-1}kg^{-1}$	$J\ K^{-1}kg^{-1}$	–	
$z$	$m$	$m$	–	
$H$	$m$	$m$	–	
$w_b(melt)$	$m\ yr^{-1}$	$m\ s^{-1}$	$10^{-6} \cdot 31536^{-1}$	
$w_b(no\ melt)$	$m\ yr^{-1}$	$m\ s^{-1}$	0	
$w_s(melt)$	$m\ yr^{-1}$	$m\ s^{-1}$	<i>accum. rt.</i>	
$heat\ flux$	$mW\ m^{-2}$	$W\ m^{-2}$	–	
$P$	–	–	–	
$\gamma$	–	–	0.37	
$\lambda$	–	–	–	
$\Delta m$	$kg\ mol^{-1}$	$kg\ mol^{-1}$	–	
$\alpha$	$K^{-1}$	$K^{-1}$	–	

## References

- [1] Laurent Arnaud, Jean-Marc Barnola, and Paul Duval. Physical modeling of the densification of snow/firn and ice in the upper part of polar ice sheets. *Physics of Ice Core Records*, pages 285–305, 2000.
- [2] J.-M. Barnola, P. Pimienta, D. Raynaud, and Y. S. Korotkevich. CO2-climate relationship as deduced from the Vostok ice core: a re-examination based on new measurements and on a re-evaluation of the air dating. *Tellus B*, 43(2):83–90, 1991.

- [3] C. Goujon, J.-M. Barnola, and C. Ritz. Modeling the densification of polar firn including heat diffusion: application to close-off characteristics and gas isotopic fractionation for Antarctica and Greenland sites. *Journal of Geophysical Research*, 108(D24), 2003.
- [4] Michael Herron and Chester Langway. Firn densification: an empirical model. *Journal of Glaciology*, 25(93):373–385, 1980.