two draughts by formula 3.1. Draughts to be used are the maximum draught amidships referred to as UIWL and the minimum draught amidships referred to as LIWL, as defined in section 2.2. In the calculations, the ship's parameters which depend on the draught must be determined at the appropriate draught, but *L* and *B* must be determined only at the UIWL. The engine output shall be no less than the greater of these two outputs.

$$P_{min} = K_e \frac{(R_{CH}/1000)^{3/2}}{D_p} \text{ [kW]}, \qquad (3.1)$$

where K_e shall be given a value according to Table 3-1.

Table 3-1: Values of K_e for conventional propulsion systems

Number of propellers	CP propeller or electric or hydraulic propulsion machinery	FP propeller
1 propeller	2.03	2.26
2 propellers	1.44	1.60
3 propellers	1.18	1.31

These K_e values apply to conventional propulsion systems. Other methods may be used for determining the required power for advanced propulsion systems (see 3.2.5).

R_{CH} is the ice resistance in Newton of the ship in a channel with brash ice and a consolidated surface layer.

$$R_{CH} = C_1 + C_2 + C_3 C_\mu (H_F + H_M)^2 (B + C_\psi H_F) + C_4 L_{PAR} H_F^2 + C_5 \left(\frac{LT}{B^2}\right)^3 \frac{A_{wf}}{L}, \qquad (3.2)$$

where

$C_\mu = 0.15 cos\varphi_2 + \sin\psi \sin\alpha$, C_μ has a value equal to or larger than 0.45

$C_\psi = 0.047\psi - 2.115$ and $C_\psi = 0$ if $\psi \leq 45°$

$H_F = 0.26 + (H_M B)^{0.5}$

H_M = 1.0 m for ice classes IA and IA Super
= 0.8 m for ice class IB
= 0.6 m for ice class IC

C_1 and C_2 take account of a consolidated upper layer of brash ice. C_1=0 and C_2=0 for ice classes IA, IB and IC.

For ice class IA Super:

$$C_1 = f_1 \frac{BL_{PAR}}{2\frac{T}{B}+1} + (1 + 0.021\phi_1)(f_2 B + f_3 L_{BOW} + f_4 BL_{BOW}),$$

$$C_2 = (1 + 0.063\phi_1)(g_1 + g_2 B) + g_3 \left(1 + 1.2\frac{T}{B}\right)\frac{B^2}{\sqrt{L}}.$$

For a ship with a bulbous bow, φ_1 = 90°.