On the Clark integral representation of functionals of Brownian motion with explicit view of integrand

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We investigate the problem of Clark integral representation for the square integrable Brownian functional F under the condition of Malliavin differentiability only of its conditional expectation $E[F \mid G_t^B]$, where (G_t^B) is the natural filtration of the Brownian motion $B = (B_t), t \in [0,T]$. We obtain the explicit form of integrands. As an illustration our result we consider the indicator $I(B_T \le x), x \in R$, which have not in general Malliavin derivative. Also applications are given. We represent the formula

$$\Phi(x)(1-\Phi(x)) = \frac{1}{2\pi}\int_0^1 \frac{e^{-\frac{x^2}{1+t}}}{(1-t^2)^{1/2}}dt,$$

which follows from our result. Here $\Phi(x)$ is the standard normal distribution function.