

## Operators involving two quarks and one or more bosons

Operator	Definition	WC	Processes affected
$\dagger O_{u\varphi}^{(ij)}$	$\bar{q}_i u_j \tilde{\varphi} (\varphi^\dagger \varphi)$	$c_{t\varphi} + ic_{t\varphi}^I$	$t\bar{t}H, tHq$
$O_{\varphi q}^{1(ij)}$	$(\varphi^\dagger \overleftrightarrow{D}_\mu \varphi) (\bar{q}_i \gamma^\mu q_j)$	$c_{\varphi Q}^- + c_{\varphi Q}^3$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, tHq, t\bar{l}q$
$O_{\varphi q}^{3(ij)}$	$(\varphi^\dagger \overleftrightarrow{D}_\mu^I \varphi) (\bar{q}_i \gamma^\mu \tau^I q_j)$	$c_{\varphi Q}^3$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, tHq, t\bar{l}q$
$O_{\varphi u}^{(ij)}$	$(\varphi^\dagger \overleftrightarrow{D}_\mu \varphi) (\bar{u}_i \gamma^\mu u_j)$	$c_{\varphi t}$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, t\bar{l}q$
$\dagger O_{\varphi ud}^{(ij)}$	$(\tilde{\varphi}^\dagger iD_\mu \varphi) (\bar{u}_i \gamma^\mu d_j)$	$c_{\varphi tb} + ic_{\varphi tb}^I$	$t\bar{t}H, t\bar{l}q, tHq$
$\dagger O_{uW}^{(ij)}$	$(\bar{q}_i \sigma^{\mu\nu} \tau^I u_j) \tilde{\varphi} W_{\mu\nu}^I$	$c_{tW} + ic_{tW}^I$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, tHq, t\bar{l}q$
$\dagger O_{dW}^{(ij)}$	$(\bar{q}_i \sigma^{\mu\nu} \tau^I d_j) \varphi W_{\mu\nu}^I$	$c_{bW} + ic_{bW}^I$	$t\bar{t}H, t\bar{t}l\bar{l}, tHq, t\bar{l}q$
$\dagger O_{uB}^{(ij)}$	$(\bar{q}_i \sigma^{\mu\nu} u_j) \tilde{\varphi} B_{\mu\nu}$	$(c_{Wc_{tW}} - c_{tZ})/s_W + i(c_{Wc_{tW}}^I - c_{tZ}^I)/s_W$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, tHq, t\bar{l}q$
$\dagger O_{uG}^{(ij)}$	$(\bar{q}_i \sigma^{\mu\nu} T^A u_j) \tilde{\varphi} G_{\mu\nu}^A$	$c_{tG} + ic_{tG}^I$	$t\bar{t}H, t\bar{t}l\nu, t\bar{t}l\bar{l}, tHq, t\bar{l}q$

## Operators involving two quarks and two leptons

Operator	Definition	WC	Processes affected
$O_{\ell q}^{1(ijkl)}$	$(\bar{\ell}_i \gamma^\mu \ell_j) (\bar{q}_k \gamma^\mu q_\ell)$	$c_{Q\ell}^{-(\ell)} + c_{Q\ell}^{3(\ell)}$	$t\bar{t}l\nu, t\bar{t}l\bar{l}, t\bar{l}q$
$O_{\ell q}^{3(ijkl)}$	$(\bar{\ell}_i \gamma^\mu \tau^I \ell_j) (\bar{q}_k \gamma^\mu \tau^I q_\ell)$	$c_{Q\ell}^{3(\ell)}$	$t\bar{t}l\nu, t\bar{t}l\bar{l}, t\bar{l}q$
$O_{\ell u}^{(ijkl)}$	$(\bar{\ell}_i \gamma^\mu \ell_j) (\bar{u}_k \gamma^\mu u_\ell)$	$c_{t\ell}^{(\ell)}$	$t\bar{t}l\bar{l}$
$O_{e\bar{q}}^{(ijkl)}$	$(\bar{e}_i \gamma^\mu e_j) (\bar{q}_k \gamma^\mu q_\ell)$	$c_{Qe}^{(\ell)}$	$t\bar{t}l\bar{l}, t\bar{l}q$
$O_{eu}^{(ijkl)}$	$(\bar{e}_i \gamma^\mu e_j) (\bar{u}_k \gamma^\mu u_\ell)$	$c_{te}^{(\ell)}$	$t\bar{t}l\bar{l}$
$\dagger O_{\ell equ}^{1(ijkl)}$	$(\bar{\ell}_i e_j) \varepsilon (\bar{q}_k u_\ell)$	$c_t^{S(\ell)} + ic_t^{SI(\ell)}$	$t\bar{t}l\bar{l}, t\bar{l}q$
$\dagger O_{\ell equ}^{3(ijkl)}$	$(\bar{\ell}_i \sigma^{\mu\nu} e_j) \varepsilon (\bar{q}_k \sigma_{\mu\nu} u_\ell)$	$c_t^{T(\ell)} + ic_t^{TI(\ell)}$	$t\bar{t}l\nu, t\bar{t}l\bar{l}, t\bar{l}q$