

Basic tensor multiplications

Product	Tensorial Notation	Index Notation	Result
Dyadic product	$A \otimes B$ or AB	$A_{ij}B_{kl}$	C_{ijkl} Fourth order tensor
Single contraction	$A \cdot B$	$A_{ik}B_{kj}$	C_{ij} Second order tensor
Double contraction	$A : B$	$A_{ij}B_{ij}$	C Scalar
Double contraction	$A : B$	$A_{ijkl}B_{kl}$	C_{ij} Second order tensor
Double contraction	$A : B$	$A_{ijmn}B_{mnkl}$	C_{ijkl} Fourth order tensor
Quadruple contraction	$A :: B$	$A_{klmn}B_{klmn}$	C Scalar

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