- <u>For the space $V = [H^1(\Omega)]^3$:</u>

<u>Lemma 3.4:</u> (Korn's inequality)

> Let $\Omega \subset \mathbb{R}^d$ be a bounded Lipschitz domain.
> Then there exists a constant $c_K = c_K(\Omega) = \text{const} > 0$:
>
> (7) $$\int_\Omega \varepsilon_{ij}(v)\varepsilon_{ij}(v)\,dx + \|v\|_0^2 \geq c_K^2 \|v\|_1^2 \quad \forall v \in [H^1(\Omega)]^d.$$

<u>Proof:</u> is very technical!
$\longrightarrow$ see literature

[ ] Duvaut G., Lions J.-L.:
Les inéquations en Mécanique et en Physique. Dunod, Paris 1972

[ ] Nitsche J. A.: On Korn's second inequality.
RAIRO Anal. Numér., 1981, v. 15, 237-248.

<u>Remark:</u>
Korn's inequality (7) yields the following norm equivalence:

$$c_K \|v\|_1 \leq |\!|\!| v |\!|\!| := \left(\|\varepsilon(v)\|_0^2 + \|v\|_0^2\right)^{1/2} \leq \|v\|_1$$

$$\forall v \in V := [H^1(\Omega)]^3.$$