For a harmonic sound field, if the complex 3-D vector ***specific*** admittance $\vec{\tilde{y}}_a(\vec{r},\omega)=\vec{\tilde{u}}(\vec{r},\omega)/\tilde{p}(\vec{r},\omega)=1/\vec{\tilde{z}}_a(\vec{r},\omega)$ at the point $\vec{r}$ happens to be very ***high***, for a fixed complex scalar over-pressure $\tilde{p}(\vec{r},\omega)$, this tells us that the complex 3-D vector particle velocity $\vec{\tilde{u}}(\vec{r},\omega)$ at that point must therefore be very ***large***, and hence the corresponding complex 3-D vector acoustic mass current density $\vec{\tilde{J}}_a(\vec{r},\omega)=\rho_o\vec{\tilde{u}}(\vec{r},\omega)$ at that point must also be very ***large***.

Conversely, if for a harmonic sound field the complex 3-D vector ***specific*** acoustic admittance $\vec{\tilde{y}}_a(\vec{r},\omega)=\vec{\tilde{u}}(\vec{r},\omega)/\tilde{p}(\vec{r},\omega)=1/\vec{\tilde{z}}_a(\vec{r},\omega)$ at the point $\vec{r}$ happens to be very ***low***, for a fixed complex scalar over-pressure $\tilde{p}(\vec{r},\omega)$, this tells us that the complex 3-D vector particle velocity $\vec{\tilde{u}}(\vec{r},\omega)$ at that point must therefore be very ***small***, and hence the corresponding complex 3-D vector acoustic mass current density $\vec{\tilde{J}}_a(\vec{r},\omega)=\rho_o\vec{\tilde{u}}(\vec{r},\omega)$ at that point must also be very ***small***.

The Real and Imaginary Components of Complex 3-D Vector *Specific* Acoustic Immittances:

As in the case for *AC* electrical circuits, the complex scalar electrical impedance $\tilde{Z}_e$ and complex scalar electrical admittance $\tilde{Y}_e=1/\tilde{Z}_e$ can be written out explicitly in terms of their real and imaginary components:

$\tilde{Z}_e \equiv R_e + iX_e\ (\Omega)$ where $R_e=\mathrm{Re}\{\tilde{Z}_e\}$ is the ***resistance*** and $X_e=\mathrm{Im}\{\tilde{Z}_e\}$ is the ***reactance***.
$\tilde{Y}_e \equiv G_e + iB_e\ (\Omega^{-1})$ where $G_e=\mathrm{Re}\{\tilde{Y}_e\}$ is the ***conductance*** and $B_e=\mathrm{Im}\{\tilde{Y}_e\}$ is the ***susceptance***.

Similarly, for the case a complex harmonic sound field $\tilde{S}(\vec{r})$, the complex 3-D vector ***specific*** acoustic impedance $\vec{\tilde{z}}_a(\vec{r})$ and complex 3-D ***specific*** acoustic admittance $\vec{\tilde{y}}_a(\vec{r})=1/\vec{\tilde{z}}_a(\vec{r})$ can be written out explicitly in terms of their real and imaginary components:

$$\vec{\tilde{z}}_a(\vec{r},\omega)\equiv\vec{r}_a(\vec{r},\omega)+i\vec{\chi}_a(\vec{r},\omega)\quad(\Omega_a)\ \text{where:}$$

$\vec{r}_a(\vec{r},\omega)=\mathrm{Re}\{\vec{\tilde{z}}_a(\vec{r},\omega)\}$ is the 3-D ***specific*** acoustic ***resistance*** at the point $\vec{r}$ and:
$\chi_a(\vec{r},\omega)=\mathrm{Im}\{\tilde{z}_a(\vec{r},\omega)\}$ is the 3-D ***specific*** acoustic ***reactance*** at the point $\vec{r}$.

$$\vec{\tilde{y}}_a(\vec{r},\omega)\equiv\vec{g}_a(\vec{r},\omega)+i\vec{b}_a(\vec{r},\omega)\quad(\Omega_a^{-1})\ \text{where:}$$

$\vec{g}_a(\vec{r},\omega)=\mathrm{Re}\{\vec{\tilde{y}}_a(\vec{r},\omega)\}$ is the 3-D ***specific*** acoustic ***conductance*** at the point $\vec{r}$ and:
$\vec{b}_a(\vec{r},\omega)=\mathrm{Im}\{\vec{\tilde{y}}_a(\vec{r},\omega)\}$ is the 3-D ***specific*** acoustic ***susceptance*** at the point $\vec{r}$.