New intermetallic magnesium compounds $RE_2Ni_2Mg_3$ ($RE = \text{Gd, Dy–Tm, Lu}$) were synthesized from the elements by induction melting. They are isotypic with $\text{Tb}_2\text{Ni}_2\text{Mg}_3$. The structure of $\text{Gd}_2\text{Ni}_2\text{Mg}_3$ was refined from X-ray powder data: $Cmmm$, $a = 398.7(1)$, $b = 2121.9(7)$, $c = 368.39(9)$ pm, $R_B = 7.49\%$, 3800 data points, 23 parameters. The $RE_2Ni_2Mg_3$ intermetallics are intergrowth variants of $\text{AlB}_2$- and $\text{CsCl}$-related slabs. $\text{Gd}_2\text{Ni}_2\text{Mg}_3$ is a Curie-Weiss paramagnet above 75 K with an experimental magnetic moment of $\mu_{\text{eff}} = 8.16(1)$ $\mu_B$/Gd atom. Antiferromagnetic ordering sets in at $T_N = 42.0(5)$ K.

**Key words:** Intermetallics, Magnesium, Crystal Chemistry