

# From Bauhaus to Gearbox?

**Faithful Addendum readers are well aware of its intent: to provide gear-related humor; whimsy; information; history; outside-the-box thinking — and whatnot.**

Here's a serving of whatnot.

Arguably the city of Chicago's most compelling, dynamic period — early 1930s -1960 — is dramatically evoked in Thomas Dya's 2013 book, *THE THIRD COAST — When Chicago Built the American Dream*.

What might make that period of particular — if somewhat offbeat — interest to Addendum readers is the fact that Chicago at the beginning of that time found itself a safe haven for German intellectual emigrés escaping to America after the Gestapo in 1933 had shut down the Bauhaus school of art and design in Weimar, celebrated for its form follows function approach — especially to architectural design.

But you thought this was a *gear* magazine — not *Architectural Digest*. But stay with us here. Berlin architect Walter Gropius (1883-1969) founded Bauhaus in 1919 with the ultimate aim of merging creative imagination with practical craftsmanship, art and *technology*. What's more, Bauhaus courses taught students to focus on the productivity of design.

This got us to thinking — some might say wool-gathering — whether there were a strain of Bauhaus DNA to be found in the make-up of mechanical engineers — i.e., gear designers and engineers.

Today, back in Germany where it belongs, (re-named in 1996) Bauhaus-Universität Weimar actually includes a chair in the field of *process engineering* — bringing it that much closer to our world of gears. Examples of discrete product processes include the casting, molding, forging and surface finishing of the component piece parts of end products or of the end products themselves.

While we think the above indicates a linkage between Bauhaus theory and gear world reality, we decided to bring in some back-up. We called upon Dr. Hermann J. Stadtfeld, vice president, bevel gear technology, R&D, Gleason Corp. Here's his impartial, clear-eyed response to this question: *Have any of the design principles of Bauhaus design theory found their way into gear design — even in subtle ways?*

- “The University of Ilmenau in Germany, where I teach my gear class each year, is only a few miles away from Weimar. Weimar was, in the 1800s, until WWII, one of the significant European centers of intellectual thinking and creation; e.g.,

(German writer and statesman Johann Wolfgang von) Goethe worked there. Still today, there is the Bauhaus School of Design. For people that like the modern Neo-Classic architecture — such as the Gleason Headquarters at 1000 University Avenue in Rochester, NY — the Bauhaus movement was a scary step further into modern, simplistic design.

“However, the Bauhaus style established a synergy between form and function; i.e. — no pedestals or ornaments which don't contribute to the strength of a building or to its functionality are acceptable in Bauhaus creations. As such, it is a very technical- and engineering-dominated style to architect a building. Bauhaus architects are more engineers than artists.

“This particular school of thinking was adopted by engineers in designing of gearboxes, castings for machine components, etc.

“If you study 1700 to 1900 mechanical constructions, you will notice on gearboxes and also machine tools those pedestals and even ornaments in order to design a more esthetic creation. This part of the Bauhaus movement can be found in mechanical structures that often are the surroundings of gears.

“However, two points have to be made:

“Engineering thinking went through a general evolution between 1850 and 1930. None of the Bauhaus teachings found their way into mechanical engineering, but they were part of the same trend in the scene of creatively engaged professionals in Central Europe.

“The function-oriented thinking at this time did not have any influence on gear design, because by the 1700s gear design was already strictly function-oriented, with involutes and rounded root fillets; with face width and tooth thickness as a result of the required torque transmission.

“This would even allow the reverse conclusion, which is that the general trend — *which also led to Bauhaus* — was a result of mechanical designs like gears, internal combustion engines, electrical generators and motors — which from the beginning had been function-oriented.”

Thus I believe the case is made that blurs the distinction between the “theoretical” world of Bauhaus and the “real” world of the gear designer/engineer. And that is why some would say:

In every good gear designer/engineer burns the soul of an artist. ⚙️