

May 8, 2023

SustainabilityPRO Cover Letter for the Living Building Challenge

This document is a compiled PDF of our technical letters for various versions of the LBC.

Information for the various versions can be found on the following pages:

- Living Building Challenge 3.0 (LBC) Requirements for Cold-Formed Steel Framing
 - Pages 2-3 of this PDF
- Living Building Challenge 4.0 (LBC) Requirements for Cold-Formed Steel Framing
 - Pages 4-6 of this PDF

Best Regards,

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September 19, 2022

Living Building Challenge 3.0 (LBC) Requirements for Cold-Formed Steel Framing

Before defining the requirements for the steel framing industry, let's quickly review what the LBC is. "This certification program covers all building at all scales and is a unified tool for transformative design, allowing us to envision a future that is Socially Just, Culturally Rich and Ecologically Benign."¹ The LBC is a green building certification program that is similar to LEED, but has only one certification level which begins approximately at the Regenerative Level of performance as seen below.

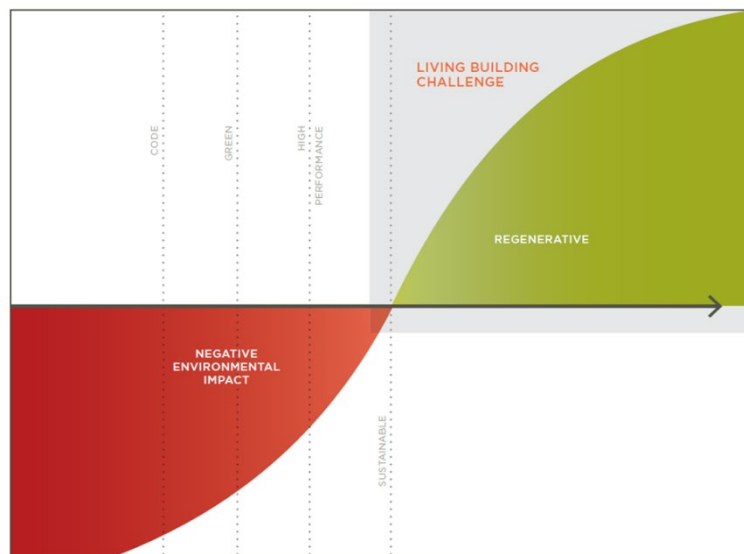


Figure 1: Living Building Challenge(SM) 3.0

"The Living Building Challenge is comprised of seven performance categories, or 'Petals': Place, Water, Energy, Health & Happiness, Materials, Equity and Beauty. Petals are subdivided into a total of twenty Imperatives, each of which focuses on a specific sphere of influence."¹ Within the Materials Petal, we find Imperative #10 which is the **Red List** and this is where we begin to see how steel framing is influenced by the LBC. The LBC version 3.0 states that the project cannot contain any of the following Red List materials or chemicals:

1. Alkylphenols
2. Asbestos
3. Bisphenol A (BPA)
4. Cadmium
5. Chlorinated Polyethylene and Chlorosulfonated Polyethylene
6. Chlorobenzenes
7. Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs)
8. Chloroprene (Neoprene)

¹ Living Building Challenge™ 2.0, Executive Summary

9. Chromium VI

10. Chlorinated Polyvinyl Chloride (CPVC)
11. Formaldehyde (added)
12. Halogenated Flame Retardants (HFRs)
13. Lead (added)
14. Mercury
15. Polychlorinated Biphenyls (PCBs)
16. Perfluorinated Compounds (PFCs)
17. Phthalates
18. Polyvinyl Chloride (PVC)
19. Polyvinylidene Chloride (PVDC)
20. Short Chain Chlorinated Paraffins
21. Wood treatments containing Creosote, Arsenic or Pentachlorophenol
22. Volatile Organic Compounds (VOCs) in wet applied products

Steel sheet coils are galvanized at the steel mill, and then as an industry standard an **additional passivation coating**, variations all commonly known as “chem treat”, is applied at the steel mill before it is shipped to their customers such as ClarkDietrich. Currently, it is also an industry standard for these additional passivation coatings to contain Chromium VI which is #9 on the Red List above, so these standard coils will **NOT** qualify for use under LBC 3.0. Chromium VI was not listed on earlier versions of the Red List, so these standard coils do qualify under LBC 2.1 and earlier.

Please note that the **maximum** content of Chromium VI passivation by product weight is 0.005%.

ClarkDietrich will consider supplying LBC 3.0 compliant materials if they are ordered in 40,000 pound increments per gauge. Our sales department will not accept any LBC 3.0 compliant orders without a project specific letter written by our Technical Services department (support@clarkdietrich.com) after they have reviewed the project requirements. Be aware that LBC 3.0 compliant materials are special order coils that ClarkDietrich does not keep in stock and are not commonly produced at the steel mill, thus they will have extended lead times and upcharges.

Please note that steel ordered without “chem treat” will have degraded corrosion resistance performance, and will start to show signs of white rust (zinc oxide) earlier than steel framing that has “chem treat” applied to it.

Best Regards,

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September 19, 2022

Living Building Challenge 4.0 (LBC) Requirements for Cold-Formed Steel Framing

Before defining the requirements for the steel framing industry, let's quickly review what the LBC is.

“The Living Building Challenge (LBC) is a certification program, advocacy tool, and philosophy defining the most advanced measure of sustainability in the built environment today. As a certification program, it addresses all buildings at all scales and is an inclusive tool for transformative design. Whether the project is a single building, a renovation, an infrastructure project, or a park, the Living Building Challenge (LBC) provides a framework for design, construction, and improvement of the symbiotic relationships between people and all aspects of the built and natural environment.”¹ The goal is for construction projects to move beyond being “less bad” for the environment to become truly regenerative.

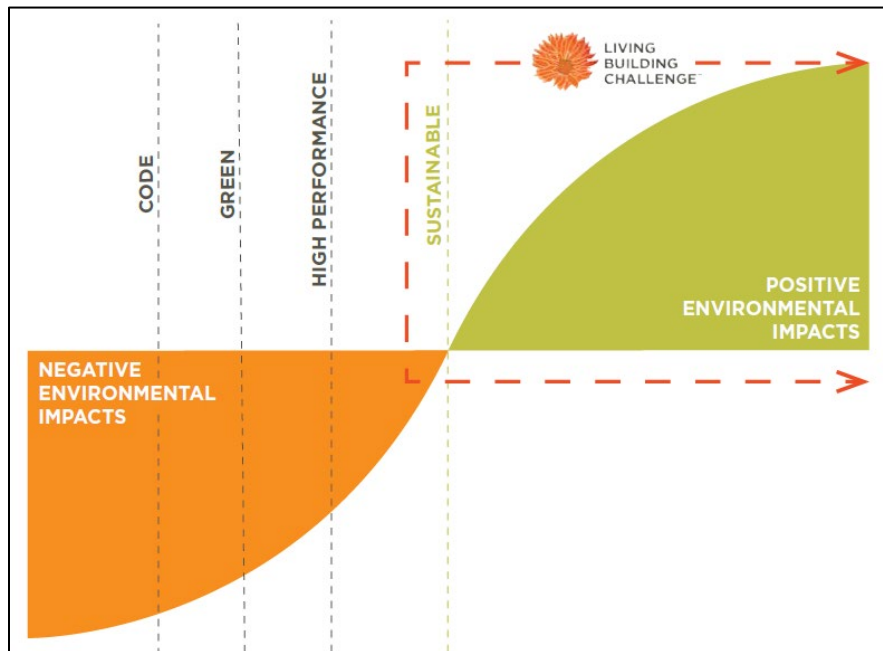


Figure 1: Living Building Challenge (SM) 4.0

“The Living Building Challenge consists of seven performance categories, or ‘Petals’: Place, Water, Energy, Health & Happiness, Materials, Equity and Beauty. Each Petal is subdivided into Imperatives, for a total of twenty Imperatives in the Challenge.”¹ Within the Materials Petal, we find Imperative #13 which is the **Red List** and this is where we begin to see how steel framing is influenced by the LBC. The LBC version 4.0 states that “all projects must avoid the following Red List chemical classes in 90% of the project’s new materials by cost. In situ materials do not need to be removed or vetted for Red List chemical classes.”¹

¹ Living Building Challenge 4.0 dated June 2019 and the Petal Handbook, July 2022

Red List Chemicals

1. Antimicrobials (marketed with a health claim)
2. Alkylphenols and related compounds
3. Asbestos compounds
4. Bisphenol A (BPA) and structural analogues
5. California-banned solvents
6. Chlorinated Polymers, including:
 - a. Chlorinated polyethylene (CPE)
 - b. Chlorinated polyvinyl chloride (CPVC)
 - c. Chloroprene (neoprene monomer)
 - d. Chlorosulfonated polyethylene (CSPE)
 - e. Polyvinylidene chloride (PVDC)
 - f. Polyvinyl chloride (PVC)
7. Chlorobenzenes
8. Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs)
9. Formaldehyde (added)
10. Monomeric, polymeric, and organophosphate halogenated flame retardants (HFRs)
11. Organotin Compounds
12. Perfluorinated and Polyfluorinated Alkyl Substances (PFAS) / Perfluorinated Compounds (PFCs)
13. Phthalates (orthophthalates)
14. Polychlorinated biphenyls (PCBs)
15. Polycyclic aromatic hydrocarbons (PAHs)
16. Short-chain and medium-chain chlorinated paraffins
17. Toxic heavy metals:
 - a. Arsenic
 - b. Cadmium
 - c. **Chromium**
 - d. Lead (added)
 - e. Mercury
18. Volatile organic compounds (VOCs) in wet- applied products
19. Wood Treatments containing creosote or pentachlorophenol

Steel sheet coils are galvanized at the steel mill, and then as an industry standard an **additional passivation coating**, variations all commonly known as “chem treat”, is applied at the steel mill before it is shipped to their customers such as ClarkDietrich. Currently, it is also an industry standard for these additional passivation coatings to contain Chromium VI which is #17.c on the Red List above, so these standard coils will **NOT** qualify for use under LBC 4.0. Chromium VI was not listed on earlier versions of the Red List, so these standard coils do qualify under LBC 2.1 and earlier.

Please note that the **maximum** content of Chromium VI passivation by product weight is 0.005%.



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ClarkDietrich will consider supplying LBC 4.0 compliant materials if they are ordered in 40,000 pound increments per gauge. Our sales department will not accept any LBC 4.0 compliant orders without a project specific letter written by our Technical Services department (support@clarkdietrich.com) after they have reviewed the project requirements. Be aware that LBC 4.0 compliant materials are special order coils that ClarkDietrich does not keep in stock and are not commonly produced at the steel mill, thus they will have extended lead times and upcharges.

Please note that steel ordered without “chem treat” will have degraded corrosion resistance performance, and will start to show signs of white rust (zinc oxide) earlier than steel framing that has “chem treat” applied to it.

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