

New sketcher style

[Issue 10100](#) is a major flaw of the sketcher workbench. While the situation is not as bad as it used to be, there are still a lot of problem. The intent of this proposal is to define a plan to finally solve it.

1) The problems

There is a problem of contrast between the default colors and the default background. For example the construction geometry blue that can be nearly invisible against the bluish gradient.

There are also a lot of different colors used to distinguish between line type, constrain status, and error status. Until recently, everything was color coded while every line had the same style and width.

Dimensions and constrains use a different color just for them, and dimensions have four different colors depending on what they are: normal, reference, expression-driven, and deactivated.

The two main axis add color that need to be taken into account.

The grid is too visible.

2) What the industry does

Other CAD program use few colors for sketches, hardly more than 4, and they are used to code for status only: unconstrained, partially constrained, fully constrained, redundancy, error. There are a few exceptions like Catia that has a slightly muted color for construction geometry and a different color for external geometry. In general, when the color is different for a reason other than status, the difference is not great, it's used to catch the eye while remaining out of the way. Dimensions and constrains follow this. Sometimes constrains have icons that are quite different from everything else. In Fusion 360 they are muted icons. In Solidworks, they are icons in green squares. In Catia, they have the same color as fully-defined geometry.

Other program heavily use line style to distinguish geometry type. Normal geometry is thick and continuous. Construction geometry is thin and dashed. Normal points and construction points are different. Dimensions are thin as well, as they should be in technical drawings although sketchers are different.

3) A solution

What I propose is to follow common industry practice:

- color is used for status only,
- line style and width is used for geometry type,
- normal points are no longer round.

There should be 6 colors. In parentheses the proposed one for classic, dark, and light in this order.

1. normal (white/white/black): for unconstrained geometry,
2. constrained(lt green/lt green/md green): for constrained geometry, active dimensions, and constrains,
3. external (blue): for external geometry, with low to medium contrast with the normal color,

4. error (red): for geometry that have redundant constrains and dimensions (and relevant constrains and dimensions) or for geometry, constrains and dimensions with an error (for example lines that are perpendicular and parallel at the same time),
5. deactivated (dk grey): for OVPs and deactivated constrains,
6. temporary (if needed): for helpers requested in [issue 11414](#).

I make the choice to add a visual distinction for external geometry. It doesn't exist in all CAD programs. For example, Alibre doesn't show a difference. Deactivated and temporary colors don't really count as they shouldn't be there for long. Most of the time, users will see 3 colors plus the temporary one.

There should be 3 line styles:

1. continuous: for normal geometry, including external geometry,
2. dashed: for construction geometry, including external geometry,
3. long dash, dash: for revolution axis, could be used for [issue 7334](#).

Long dash, dash, line style doesn't exist currently, it's dash dot.

There should be 2 line weights:

1. thick: for normal geometry and normal external geometry,
2. thin: for construction geometry, construction external geometry, and dimensions.

There should be 2 point types:

1. normal point: a cross,
2. construction point: round as current implementation.

There have been a soft rejection for this: see [issue 11919](#). I maintain that it will be necessary once hole patterns driven by points are implemented. Of course the difference should be visible when the sketch is closed.

Because all dimensions will have the same color (constrained), they should be distinguished as follow:

1. normal dimensions: just the text as today,
2. reference dimension: value between parentheses,
3. expression-driven: with a symbol near the value,
4. deactivated dimensions: strike-through value.

For dimensions, see [issue 12036](#).

The grid should have the thinnest lines. Major lines are continuous and minor lines are dotted. The color should have low contrast with the background to avoid clashing with the sketch, and low saturation.

To avoid contrasting problems with the gradient background in classic theme, I propose to have a plain color by default, the same as the top color of the gradient. BTW even Catia has contrast problems with its gradient.

Main sketch axis are discussed in [issue 12456](#). I propose making them as infinite construction lines, and adding short arrows indicating H or V instead of X/Y/Z color code.

I also propose to reconsider negative and positive space of sketches, as presented in [issue 11482](#).

3) Roadblocks

Besides non implemented feature request presented above, there are two major roadblocks that are going to need a lot of work to get rid of. The one that needs less talk is normal external geometry that only exist in the Link branch currently. The other one is presented in issue [13391](#). Solving the duplicate points issue would be a major architecture change, but it would be for the better. It would remove most coincident constrains (remaining one could then have the icon near them), with the price of having to implement a "cut" feature to separate two lines with a common vertex.