

SPECIFYING BLACKENED STEEL

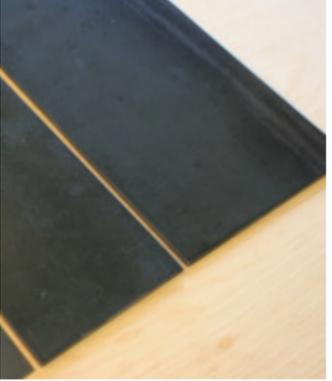
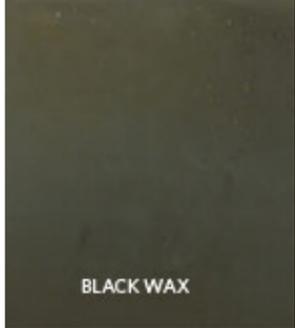
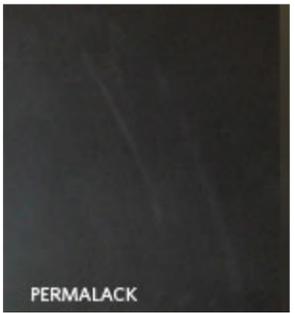
“Blackened Steel” and “Blackening” refer to a variety of treatments applied to ferrous metals to produce a dark metal finish. Unless you have a sample to match, specifying “Blackened Steel” as a finish is open to a wide range of interpretations. There are a number of possibilities depending on such variables as steel type, desired corrosion/scratch resistance, and consistency of color

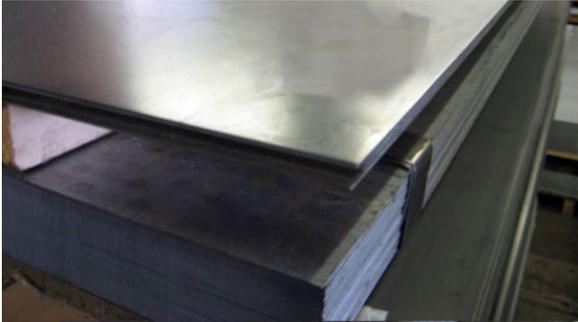
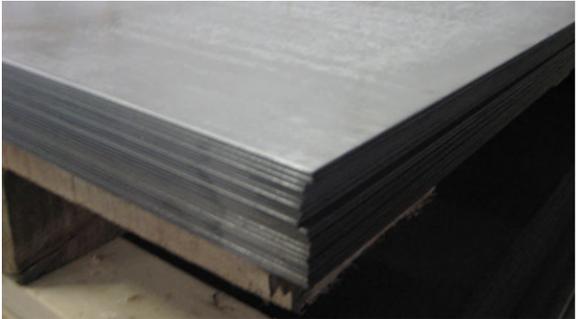
Below, is a matrix of products/processes that will give you an idea of what to specify. As an alternative to a product you may want to consider a specialized finisher that is capable of creating any or all of these finishes. A list of these vendors appears in “sources” section. Careful consideration should be given to whether the finish is to be applied in the field or in a shop. Keep in mind that “raw” steel whether HRS, CRS or P&O, varies widely from one distributor to the next. It is best to require inspection and approval of the steel. In all cases your specification should call for a minimum of (3) 12”x12” samples to show the full range.



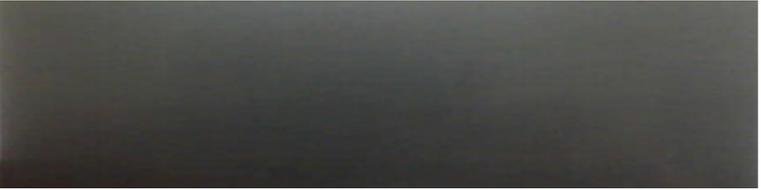
PROCESS COMPARISONS

	MEDIUM	DESCRIPTION	APPLICATION	RUST RESISTANCE AND SCRATCH RESISTANCE	OBSERVATIONS/COMMENTS	SOURCES
	BLACK OXIDE "HOT" BLACKENING	Black oxide is the conversion coating formed by a chemical reaction with the iron in steel to form an integral protective surface. This is in contrast to an applied coating which bonds to the metal but does not react chemically.	7-Step process where Steel immersed in hot caustic soda bath resulting in a thin corrosion resistant finish	A true black oxide finish will not chip, peel, flake, or rub off. Black oxide can only be removed by mechanically or chemically removing the finish itself	This is a factory applied Industrial Finish using nasty chemicals. Tends to be uniformly black	Specify a vendor: http://www.clevelandblackoxide.com
	BLACK OXIDE "COLD" BLACKENING	The "cold" black oxide process, applied at room temperature are not true oxides, but soft deposits that offer less corrosion and abrasion resistance than the "hot" oxide process	Developed as an alternative to Hot blackening this is still a multi-step process requiring rinsing and chemical disposal Applied brush-on coat or as an immersion. Requires some finesse in application	Requires a secondary protective coating (e.g. Permalac Lacquer or Wax) to prevent rust	Requires some finesse in application. Tends to be uniformly black. Available in Gel form which has the advantage of not dripping as readily when applied vertically thus creating a more even patina	Birchwood Technologies https://www.birchwoodtechnologies.com "Presto Black Gel"
	PATINAS AND STAINS	LIQUID PATINAS are pre-mixed chemical compounds that are used to produce color changes in metal and bonded metal pieces. They do not oxidize the metal in any form; they simply lay on the surface of the steel	May be used cold, as a brush-on, spray-on rub-on or immersion depending on the type used	Requires a secondary protective coating (e.g. Permalac Lacquer or Wax) to prevent rust	They do not oxidize the metal in any form; they simply lay on the surface of the steel An "artisanal" process. End result varies according to personal methods, skill and hand.	Jax http://www.jaxchemicals.com/ "Iron, Steel & Nickel Blackener" Sculpt Nouveau https://www.sculptnouveau.com "Dye Oxide Patina" "Vista Patina" "Patina Stain" "Black Magic Patina"
	WAX	formulated as final coat sealant, Clear and Colored waxes are surface applied - hot or cold Hot melt application forms a protective finish by binding with surface irregularities	An "artisanal" process. End result varies according to personal methods, skill and hand.	Hard finish resistant to rust and capable of being "touched-up"	Relatively easy/safe. Available as Clear or Black	Sculpt Nouveau "Metal Wax" https://www.sculptnouveau.com
	CLEAR TOP COATS	High-performance lacquers developed for exterior metal application will seal bare metal surfaces while enhancing the inherent Black finish of the metal	Sprayed or brushed on	Intended for exterior use, but scratching the surface can, conceivably, lead to oxidation down the road	Relative evenness of surface dependent on surface prep and steel selection. Available in Flat finish	Permalac Flat, Permalac Satin http://www.peacocklabs.com

	UNFINISHED	"HOT" BLACKENING	"COLD" BLACKENING	BLACK WAX	CLEAR TOP COATS	PATINAS AND STAINS
HOT ROLLED STEEL (HRS)	<p>Hot rolled steel comes with an oxidized outer layer called mill scale created in the cooling process. Minor surface defects are inherent in hot rolled steel</p>  <p><i>Note the "scale" on the surface of HRS</i></p>	<p>Black Oxide over mill scale, lacquer topcoat</p> 	 	 <p>CLEAR WAX</p>  <p>BLACK WAX</p>  <p>DARK WAX</p>	 <p>PERMALACK</p>	 <p>VISTA PATINA BLACK</p>  <p>PATINA STAIN</p>  <p>UNIVERSAL BLACK PATINA</p>
						
						

	UNFINISHED	"HOT" BLACKENING	"COLD" BLACKENING	BLACK WAX	CLEAR TOP COATS	PATINAS AND STAINS
COLD ROLLED STEEL(CRS)	<p>CRS starts as hot rolled sheet and is "pickled" in acid to remove the black fire scale from mill rolling. Finally it is oiled and rolled cold between polished rolls to its final dimension. CRS is somewhat harder than hot-rolled with a smooth, uniform surface</p>  					 
PICKLED & OILED STEEL(P&O)	<p>"Pickled and Oiled" is hot-rolled sheet with the additional steps of pickling to remove scale and oiling to retard rust formation. P&O steel is not cold rolled so it has a rougher surface finish than cold-rolled</p>  					

Metal Fabricators Specializing in Blackening

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Caliper Studio</p>	<p>The fabrication shop at Caliper Studio provides custom architectural metalwork to architects, general contractors, and end users. Our working method integrates seamlessly with CNC cutting and forming operations used in a majority of our projects. Through our technical knowledge, skilled craftspeople and designers, we work closely with clients to help realize every project's full potential.</p>  <p>Detail showing tonal variation intrinsic to the blackening process</p>	<p>http://www.caliperstudio.com</p> <p>Caliper Studio 67 Metropolitan Ave Second Floor Brooklyn, NY 11249</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Cleveland Black Oxide</p>	<p>We work with professionals in creating the exact "look" and finish they are seeking for a given project. Customers like the Ritz Carlton, Herman Miller and Liz Claiborne have incorporated black oxide blackened steel panels and fixtures into their design. Customers come to Cleveland Black Oxide from all over the country because of our experience with large architectural panels and other products. We work with architects, builders and contractors and offer our expertise in helping your job go smoothly. Utilizing our proprietary hot black oxide chemistry and post-process finishes, we can give your panels the look and feel you're seeking for a specific job. Cleveland Black Oxide has the largest tanks in the U.S. at 17' in length</p> 	<p>http://clevelandblackoxide.com/applications/architectural-products/</p> <p>Cleveland Black Oxide 836 Broadway Avenue Cleveland Ohil 41115</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Stuart Deane</p>	<p>The Stuart Deane Company now offers a cost effective method to oxidize stainless steel. Through a staged chemical process, a uniform oxidized (blackened) finish is achieved. The stainless steel does not have to be immersed in a chemical bath, nor are any coloring agents employed. This will offer Architects and Fabricators the ability to widen the range of finishes available to their clients. Using new and existing number 4 satin finish stainless steel, Stuart Deane can apply an oxidized (blackened) finish to the surface of the Stainless Steel. The oxidized stainless steel can also be used on the exterior of a building. This allows existing materials to be altered in place, removing the expense of replacement of the existing stainless steel. Also, any scratches or wear that may occur during the installation of new panels, can be repaired in the field.</p> 	<p>http://www.stuartdean.com/</p> <p>Stuart Deane 371 Dorchester Ave Suite175 Boston, MA 2127</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Make Architectural Metalworking</p>	<p>Make Ltd. is a Boston based architectural metal fabrication and design firm that prides itself on the knowledge and craftsmanship that has provided countless solutions in a challenging industry. We are led by extensive design, art and fabrication backgrounds that have been combining the craft of metalwork since 1990. Make Ltd. has collaborated with a diverse clientele such as architects, art institutions, public artists, contractors, designers, home owners, restoration firms, retailers and other fabricators.</p> 	<p>http://www.makearchmetal.com</p> <p>Make Architectural Metalworking 2358 Cranberry Hwy West Wareham, ma 02576</p>