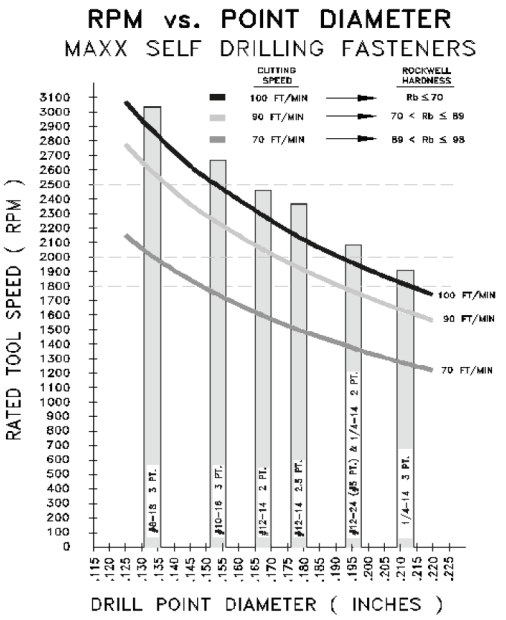
Self Drilling Screw "Burnout" Causes and Prevention

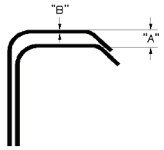
Research on the ability of a fastener to drill through several ply's of hardened steel in todays market expose problems associated with the technological advances in materials and equipment. Light gauge steel being manufactured is made harder to increase its strength, yet with this hardness comes a tradeoff in reduced ductility creating a more brittle alloy, along with greater difficulty penetrating these materials with self drilling screws. In addition to the increased hardness of the cold formed members, tools for installation have undergone a transformation to lighter tools with faster drill speeds. The latest trend in the marketplace are tools which include a percussion action to beat the fastener as it drills through the hardened material. This vertical "hammer" or rotational "impact" action in addition to the higher speed at which these tools drill, puts increased stress on the cutting edges of the drill points, along with chipping off the protective coating finish on the hex heads, over compressing the washers, and even breaking the screw. A drill point is designed to cut the softer steel away as it advances through the base material. If the cutting edge of the drill point is moving faster than it can cut away the steel, the point will "burnout", due to the friction as it spins out, instead of cutting. Slowing the RPM's down will allow the drill point to cut through the steel. The chart shows the relationship between steel hardness, screw diameter and the recommended drill speed for optimal performance.



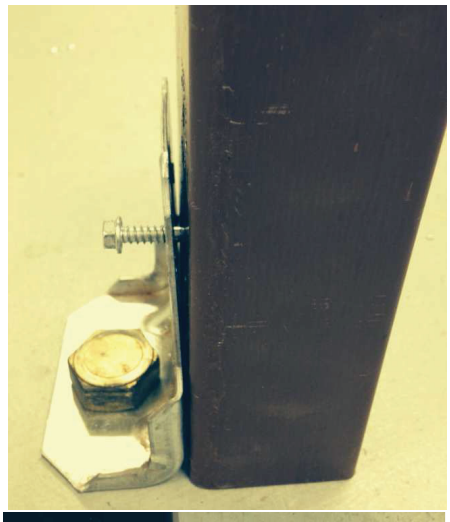
There are other problems affecting a screws performance. Screws should be installed as close to perpendicular to the substrate as possible to prevent binding or tip breakage. Additionally when a drill screw is required to penetrate 2 or more pieces of material, there is typically a gap between the seperate pieces. The drill point must be longer than the total thickness of all materials plus any gaps, to prevent the threads of the screw from engaging before drilling completely through the last piece. This is evident with "NESTED" PURLINS as shown in the illustration. When erecting mini-storage warehouse, the clip to girt/post installation, if the clip angle is not stiff enough to hold its shape before the point can penetrate the material, the clip can slightly "bend"as the point pushes the second piece away. If the threads happen to engage in the first piece, the screw will advance faster than it can drill and push the material away from each other. This can cause the screw to burnout or bind between the parts, possibly breaking the tip off. When attaching a small loose clip to a larger piece, where placement is critical, the smaller piece should have a pre-drilled "clearance" hole located for the first fastener to avoid mis-alignment or distortion when the threads engage. A easy way to prevent separation of the materials to be attached, is to clamp the pieces together to hold them in close contact throughout the drilling process. A pair of "C" clamp locking pliers as shown, is a inexpensive and quick way to prevent the separation problem mentioned.

"NESTED" PURLINS

PURLIN GA.	PURLIN THICKNESS SINGLE "B"	NESTED "A"
16	.063	.190-.210
14	.078	.300-.320
12	.104	.390-.420



SELF DRILLING FASTENERS MUST DRILL THROUGH BOTH PURLINS BEFORE ENGAGING THREADS IN TOP PURLIN....



6357 Reynolds Road Tyler, Texas 75708 | P.O. Box 4515, Tyler, Texas 75712 | 800-352-4864 | 800-352-3940 Fax
9950 Princeton Glendale Rd. Cincinnati, OH 45246 | 800-944-8920 | 800-352-3940 Fax
Copyright 2016© Hargis Industries Inc DBA ST Fastening Systems. All rights reserved.