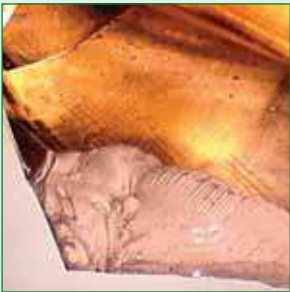


| problem                                                                                                                              | source                      | solution                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>drill breakage</b><br><br>                       | <b>clamping chuck</b>       | <ul style="list-style-type: none"> <li>Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> </ul>                                                                             |
|                                                                                                                                      | <b>workpiece movement</b>   | <ul style="list-style-type: none"> <li>Stabilise workpiece chucking and check stability of machine tool.</li> </ul>                                                                                                                            |
|                                                                                                                                      | <b>wrong drill</b>          | <ul style="list-style-type: none"> <li>Check drill type, drilling depth, cooling system, and workpiece material.</li> </ul>                                                                                                                    |
|                                                                                                                                      | <b>insufficient coolant</b> | <ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.</li> </ul> |
|                                                                                                                                      | <b>cutting conditions</b>   | <ul style="list-style-type: none"> <li>Check cutting values, and possibly reduce feed.</li> </ul>                                                                                                                                              |
|                                                                                                                                      | <b>clamping chuck</b>       | <ul style="list-style-type: none"> <li>Check torque transmission. Use hydraulic clamping chuck or high-precision chucking system.</li> </ul>                                                                                                   |
| <b>splintering on the cutting corners</b><br><br> | <b>workpiece movement</b>   | <ul style="list-style-type: none"> <li>Stabilise workpiece chucking and check stability of machine tool.</li> </ul>                                                                                                                            |
|                                                                                                                                      | <b>wrong drill</b>          | <ul style="list-style-type: none"> <li>Check drill type, drilling depth, cooling system, and workpiece material. Possibly use longer drill.</li> </ul>                                                                                         |
|                                                                                                                                      | <b>insufficient coolant</b> | <ul style="list-style-type: none"> <li>Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides.</li> </ul> |
|                                                                                                                                      | <b>cutting conditions</b>   | <ul style="list-style-type: none"> <li>Check cutting values, and possibly reduce feed.</li> </ul>                                                                                                                                              |