Increasing focus on environmental issues in industrial production has urged a number of sheet metal forming companies to look for new tribo-systems in order to substitute hazardous lubricants such as chlorinated paraffin oils. The problems are especially pronounced, when forming tribologically difficult sheet materials such as high strength steels and stainless steels, and when the forming process itself due to high normal pressures causes substantial temperature increase in the tool/work piece interface. Higher temperatures lead to thinner lubricant films and the risk of galling, i.e. breakdown of the lubricant film causing pick-up of work piece material on the tool surface and scoring of subsequent work piece surfaces. The present paper gives an overview of more than 10 years work by the authors’ research group through participation in national as well as international framework programmes on developing and testing environmentally friendly lubricants and tool materials and coatings inhibiting galling. Partners in the programmes come from Germany, United Kingdom, Finland, Poland, Slovenia, Spain and Denmark. They represent lubricant developers, testing experts and industrial end users as well as numerical modelling experts simulating fundamental lubrication mechanisms and computing basic process parameters. The authors’ group has especially been involved in the development of a system of tribo-tests for sheet metal forming and in testing and modelling of friction and limits of lubrication of new, environmentally friendly lubricant.