

Chapter 11

Assessment of Properties of Films on Cylindrical Testing Rods

In effort to replace the chromium plating by plasma spraying in case of the columns of metal die casting machines 5 powder types were applied onto the rods made of material 12 050 and with the dimensions of \varnothing 16–300 mm.

The testing rods were subjected to the following:

- tests of fatigue properties which were performed with the tensile machine with the pulsator ZD-10 PU,
- tensile tests in the sphere of plastic deformations. The tests were performed by the tensile testing machine ZD-40.

The testing conditions were selected so that they severalfold exceed standard operation loading of the material. Adhesion of the films was observed visually. In realization of the fatigue tests in order of 10^5 – 10^6 cycles with loading of $F_{\min} = 4$ kN– $F_{\max} = 70$ kN the film disturbance did not occur. The microcracks and disturbance of compactness of the films could be observed with the loadings ranging from 63 up to 80 kN. In case of the hard chromium film the microcracks occurred with the loading by the applied force of 120 kN and substantial film disturbance occurred with the loading of 127 kN.