Chapter 6
Surface Preparation Process

6.1 Definition of Process and Target Parameters

6.1.1 Process Parameters

Blast cleaning can be considered to be an erosion process. Erosion is a tribological term, and it can be discussed based on a tribological system. The tribological system for solid particle erosion is schematically shown in Fig. 6.1. The tribological system features the loading collective, the wear parameters and the bodies involved in the process. The loading collective characterises the \textit{process parameters}.

The blast cleaning process is characterised by numerous process parameters that determine efficiency, economy and quality of the whole process. Therefore, optimisation of the process is a primary requirement for a successful application. Generally, the process parameters in blast cleaning divide as listed below (see also Fig. 6.2).

1. Pneumatic parameters:
   - air (nozzle) pressure, $p$;
   - nozzle diameter, $d_N$;

2. Process parameters:
   - stand-off distance, $x$;
   - impact angle, $\varphi$;
   - exposure time, $t_E$;
   - number of passes, $n_S$;

3. Abrasive parameters
   - abrasive mass flow rate, $\dot{m}_P$;
   - abrasive particle diameter, $d_P$;
   - abrasive particle size distribution, $f(d_P)$;
   - abrasive particle shape;
   - abrasive particle hardness, $H_P$;
   - abrasive recycling capacity.
6.1.2 Target Parameters

The tribological system shown in Fig. 6.1 also features wear parameters, which are basically parameters describing material loss and parameters characterising surface modifications. Parameters for the description of surface modifications are discussed in Chap. 7.12.2. Material loss parameters are denoted target parameters in this chapter.

Target parameters are illustrated in Fig. 6.2. The most important target parameter in blast cleaning applications is the cleaning rate, which is given as follows: