



## Supplementary Materials

Table S1. Chemical composition of AISI 1045 steel.

| Elements | wt%       | Elements | wt%    | Elements | wt%       |
|----------|-----------|----------|--------|----------|-----------|
| C        | 0.42–0.50 | Ni       | ≤0.25  | Si       | 0.17–0.37 |
| Cr       | ≤0.25     | P        | ≤0.035 | Cu       | ≤0.25     |
| Mn       | 0.50–0.80 | S        | ≤0.035 | Fe       | Other     |

Table S2. Properties of AISI 1045 steel.

|                                       |          |                         |                        |
|---------------------------------------|----------|-------------------------|------------------------|
| Tensile strength $\sigma_b$           | ≥600 Mpa | Brinell hardness HB     | ≤197                   |
| yield strength $\sigma_s$             | ≥355 Mpa | Modulus of elasticity E | 210 Gpa                |
| Extensibility $\delta$                | ≥16%     | Poisson ratio $\nu$     | 0.269                  |
| Reduction of crosssection area $\psi$ | ≥40%     | Density $\rho$          | 7.85 g/cm <sup>3</sup> |

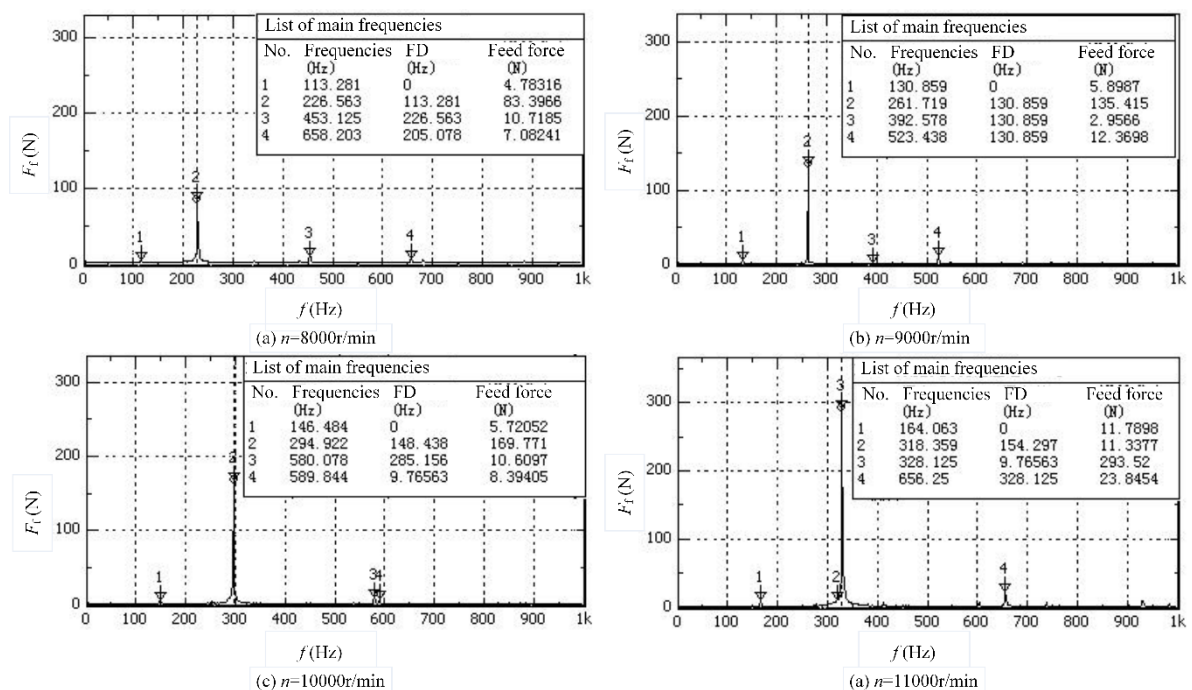


Figure S1. The amplitude spectrum of feed force  $F_t$  with different spindle speed when the feed per tooth is 4.44  $\mu\text{m/z}$  and axial depth of cut is 0.6 mm.