

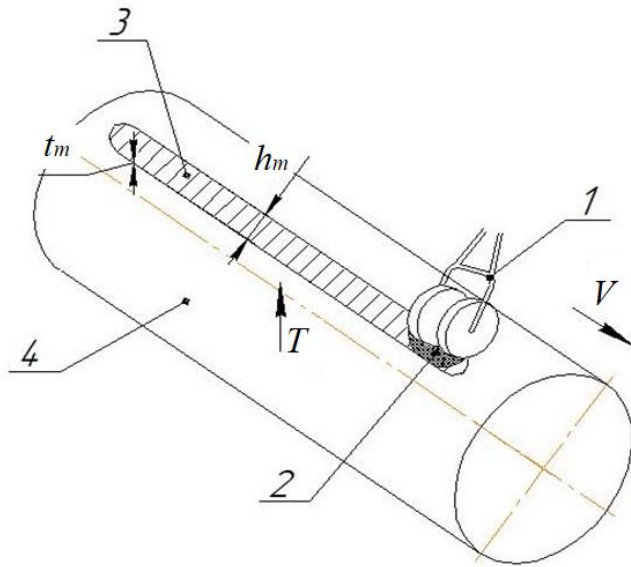
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PRELIMINARY LOCAL THERMAL IMPACT AS A SURFACE QUALITY ASSURANCE FACTOR

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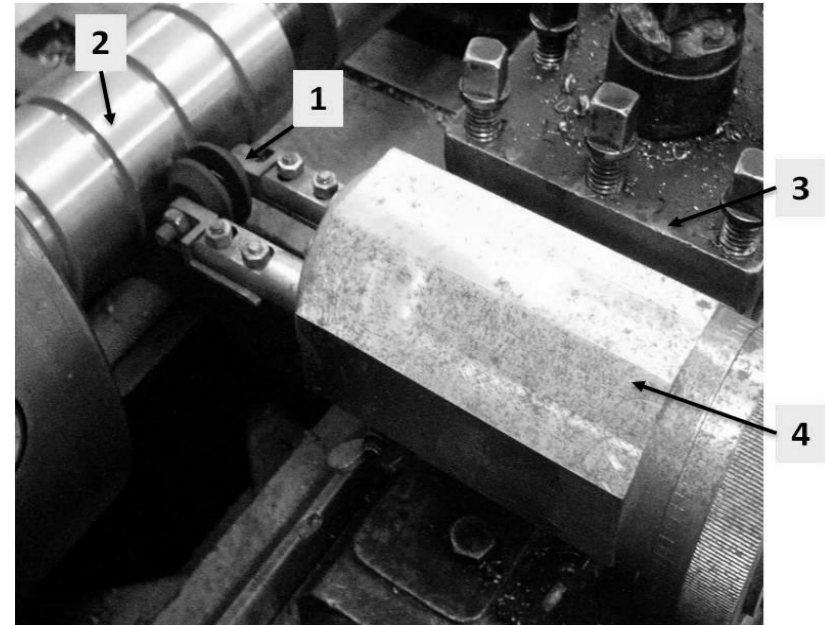
Saint-Petersburg Mining University
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Scheme of application of preliminary local thermal impact



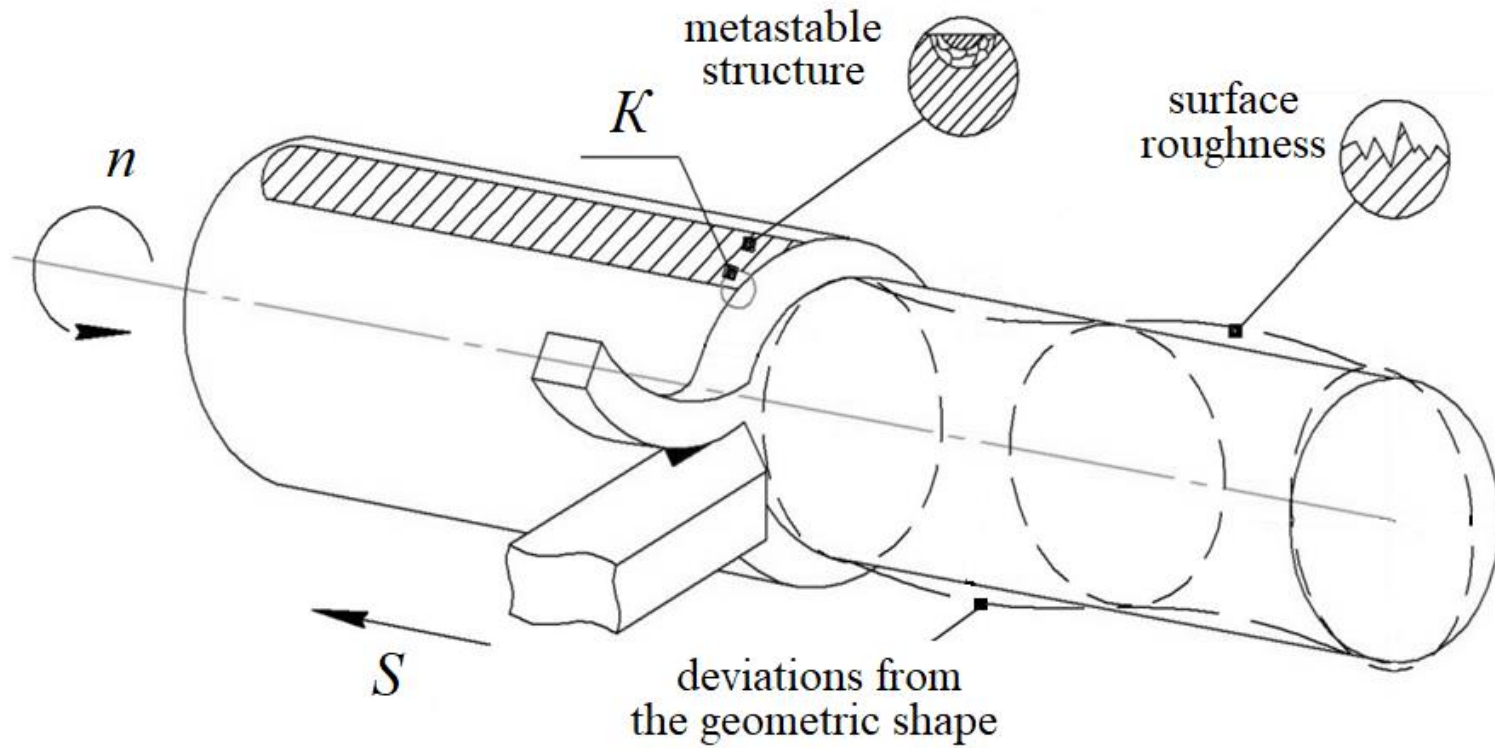
1 - heat source; 2 - zone of local impact; 3 - zone with metastable structure; 4 - workpiece

Process of applying local thermal impact

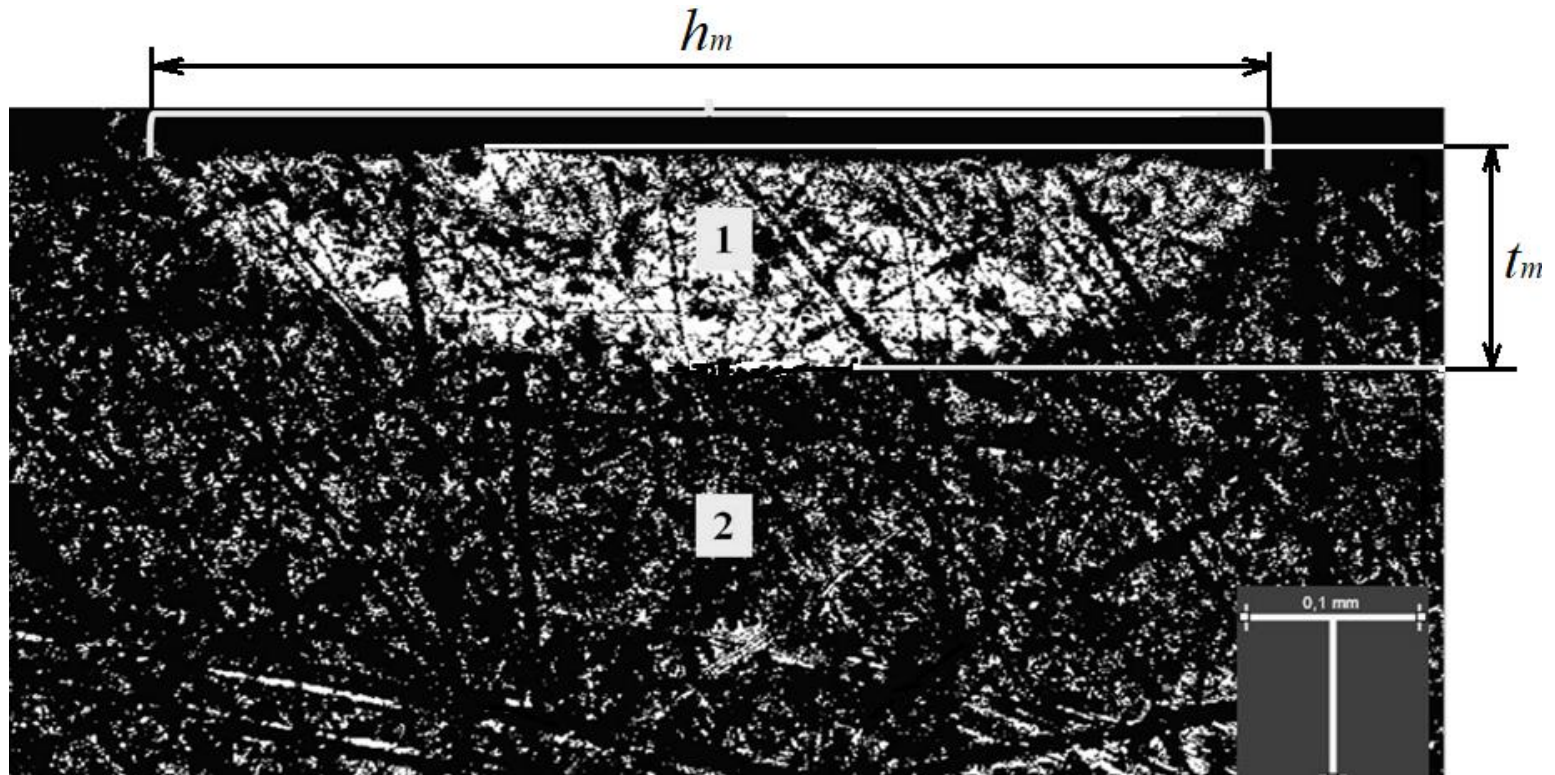


1 - contactors are devices for applying a local thermal effects;
2 - workpiece (material - steel 45);
3 - tool holder;
4 - device for applying local thermal effects

Mechanical processing scheme with preliminary local thermal impact applied

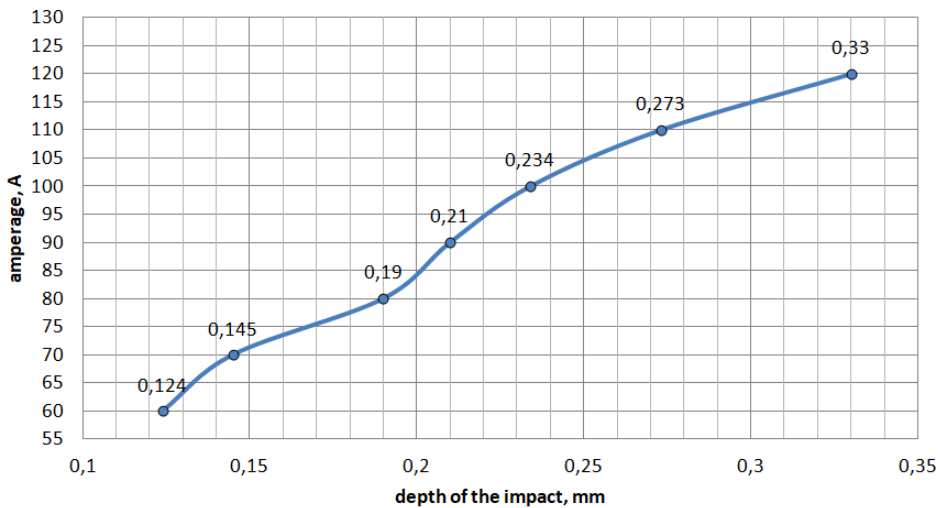


Structural changes in the material of the workpiece (steel 45) in the area of local thermal impact

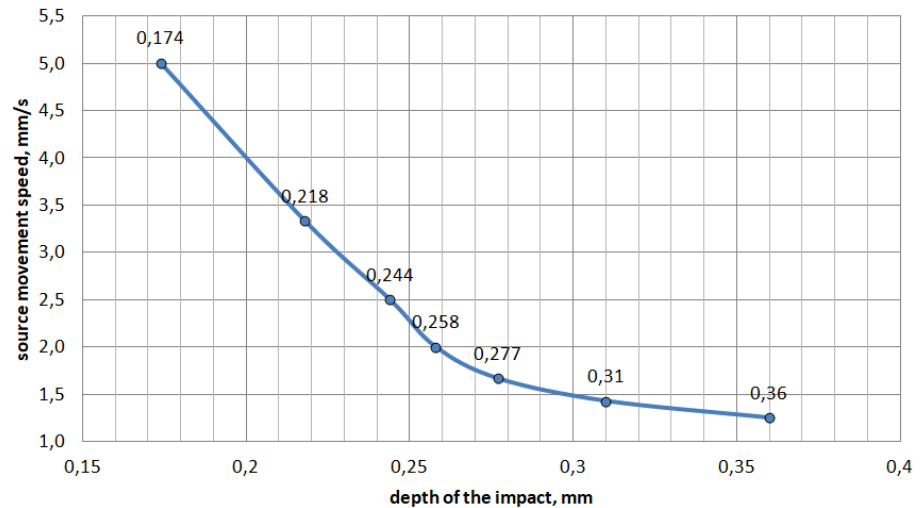


- 1 - zone of increased hardness;
- 2 - layer not affected

Dependence of local thermal depth on current strength for steel 45



Dependence of the depth of the local thermal impact on the speed of movement of the device, implementing the process of applying the local thermal impact line for steel 45



Conclusion

The graphs created allow the rational assignment of operating modes of the device, implementing the process of applying the local heat-affected line to the surface of the workpiece before its edge cutting machining to ensure the specified depth of the local heat-affected line. Application of preliminary local thermal impact will assure the specified quality of the surface of the treated workpiece at semi-finishing and finishing edge cutting machining modes and stable segmentation of the flow chips