

FORMAÇÃO DE CAVACOS

SEP0279 – PORCESSAMENTO DE MATERIAIS II - USINAGEM DOS METAIS

AULA-5: Formação de Cavacos

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FORMAÇÃO DE CAVACOS

Formação de cavacos



FORMAÇÃO DE CAVACOS

Formação de cavacos

P

Steel



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Formação de cavacos

M

Stainless steel

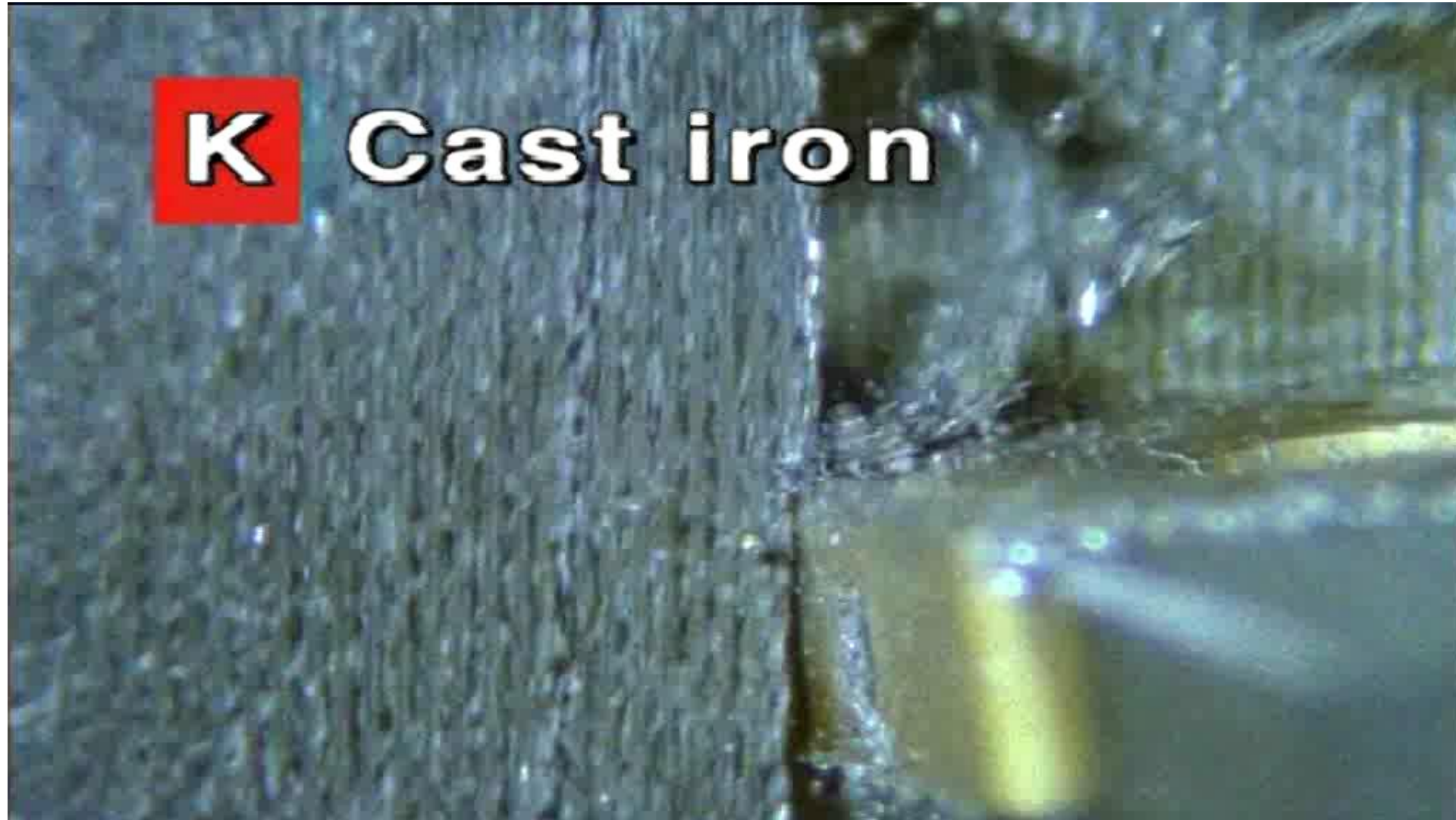


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Formação de cavacos

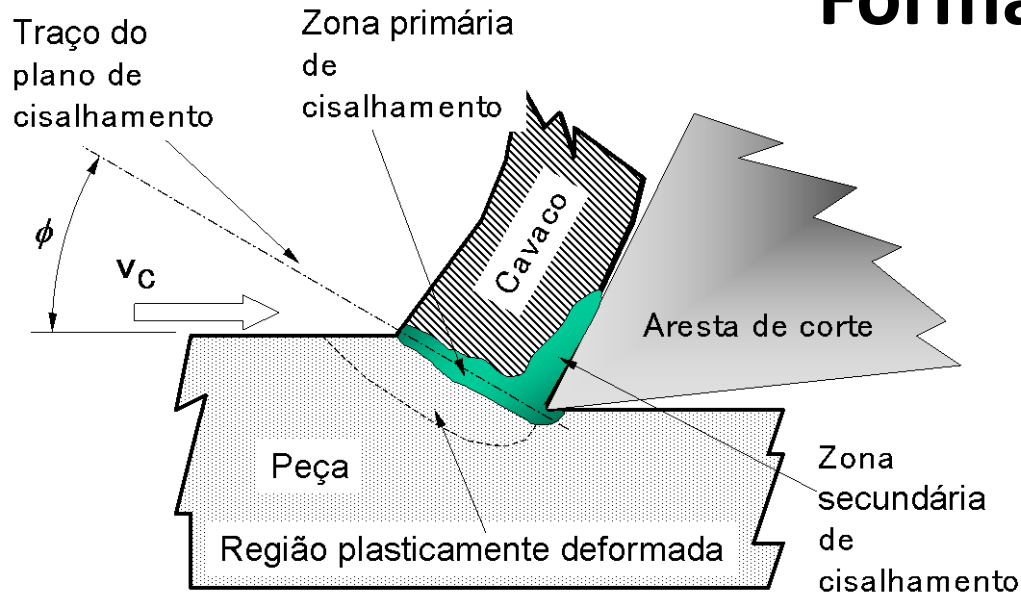
K

Cast iron



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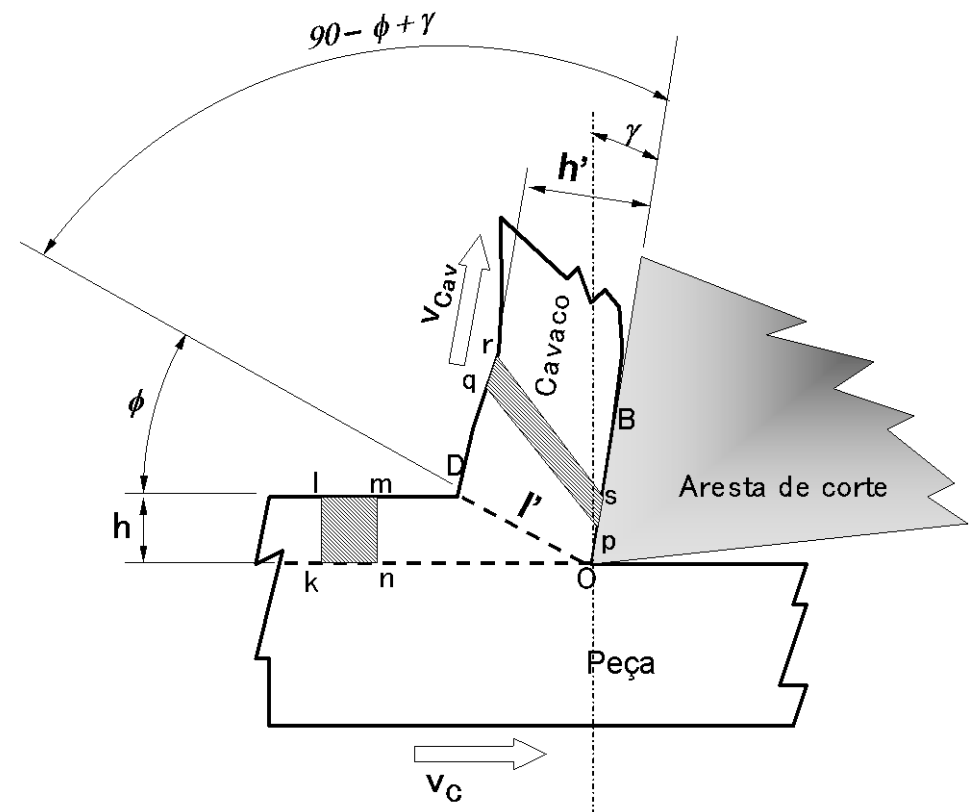
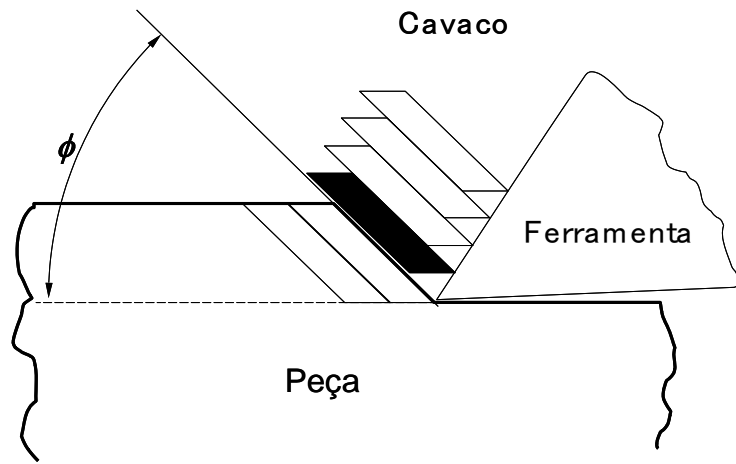
Formação do cavaco



- 1) Recalque inicial.
- 2) Deformação e ruptura
- 3) Deslizamento das lamelas
- 4) Saída do cavaco

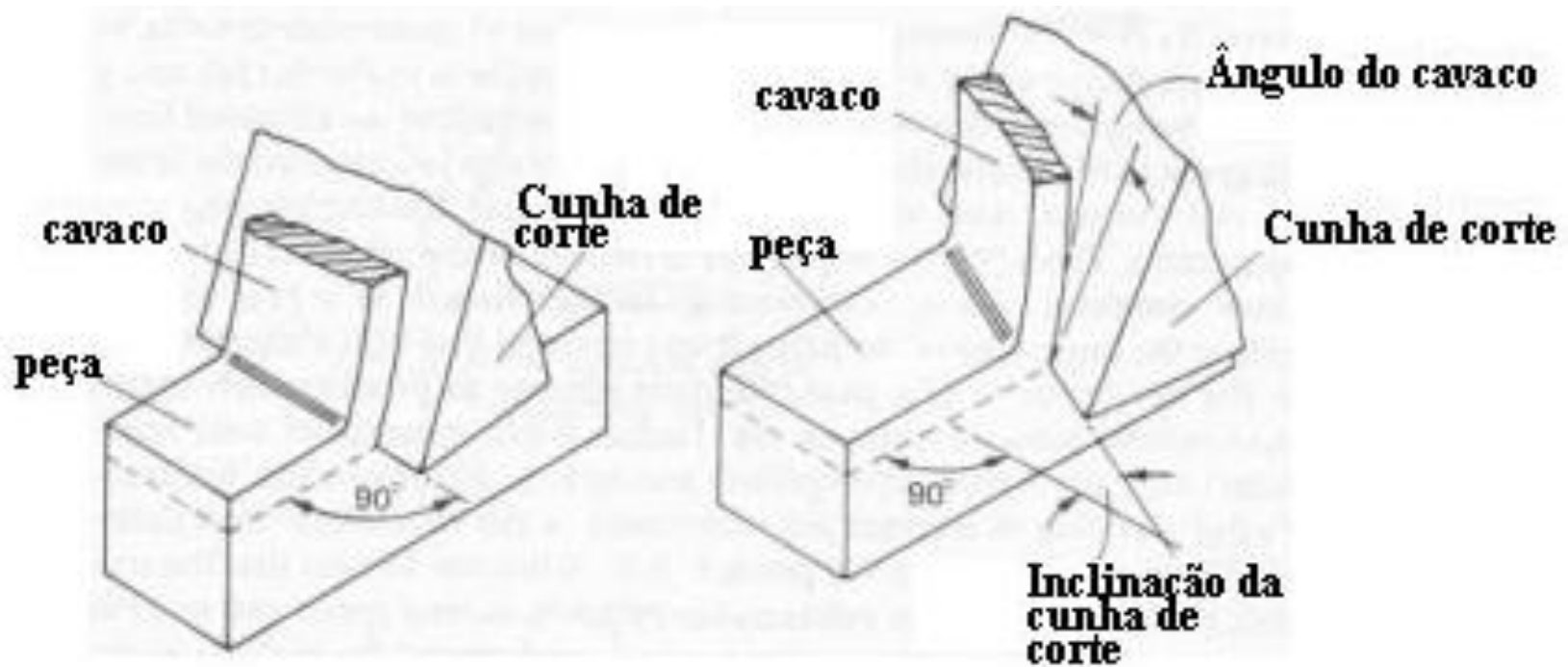
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Modelo teórico de formação do cavaco



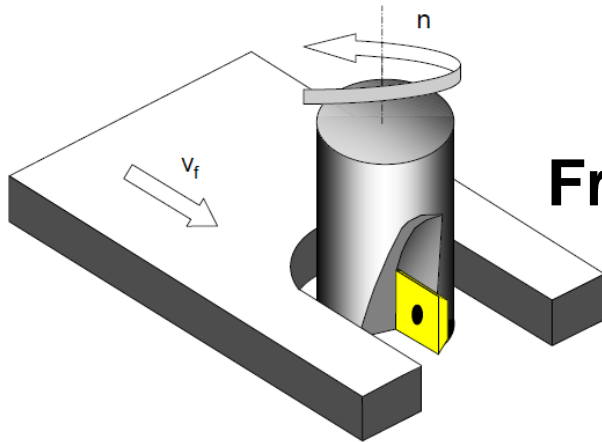
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CORTE ORTOGONAL E OBLÍQUO



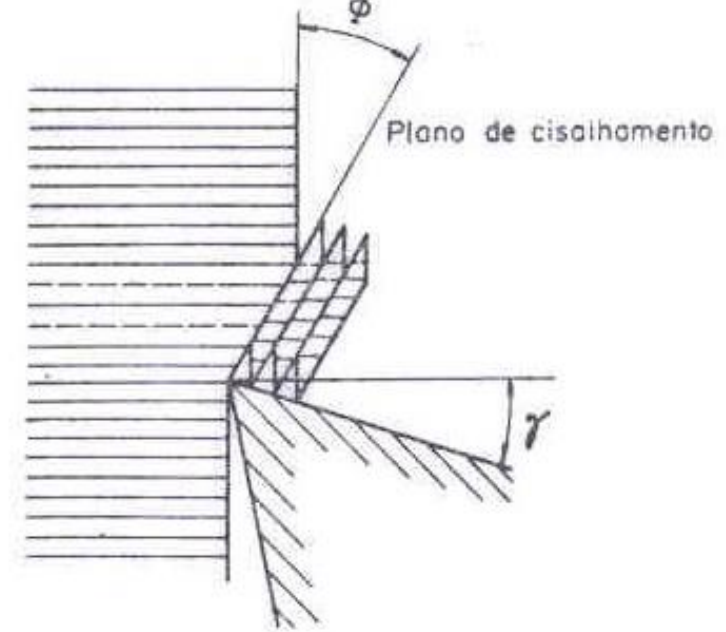
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Corte ortogonal

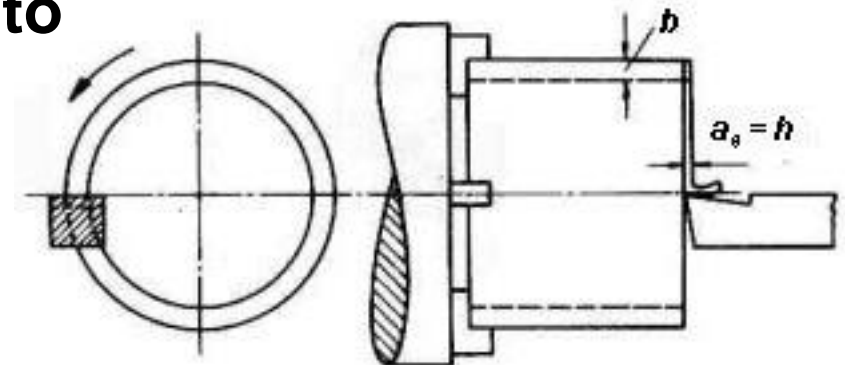
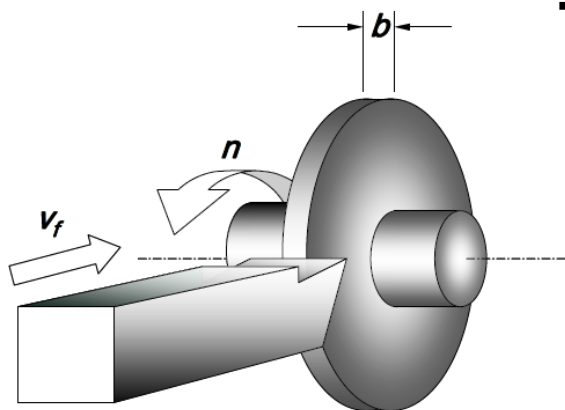


Fresamento

Modelo Teórico



Torneamento



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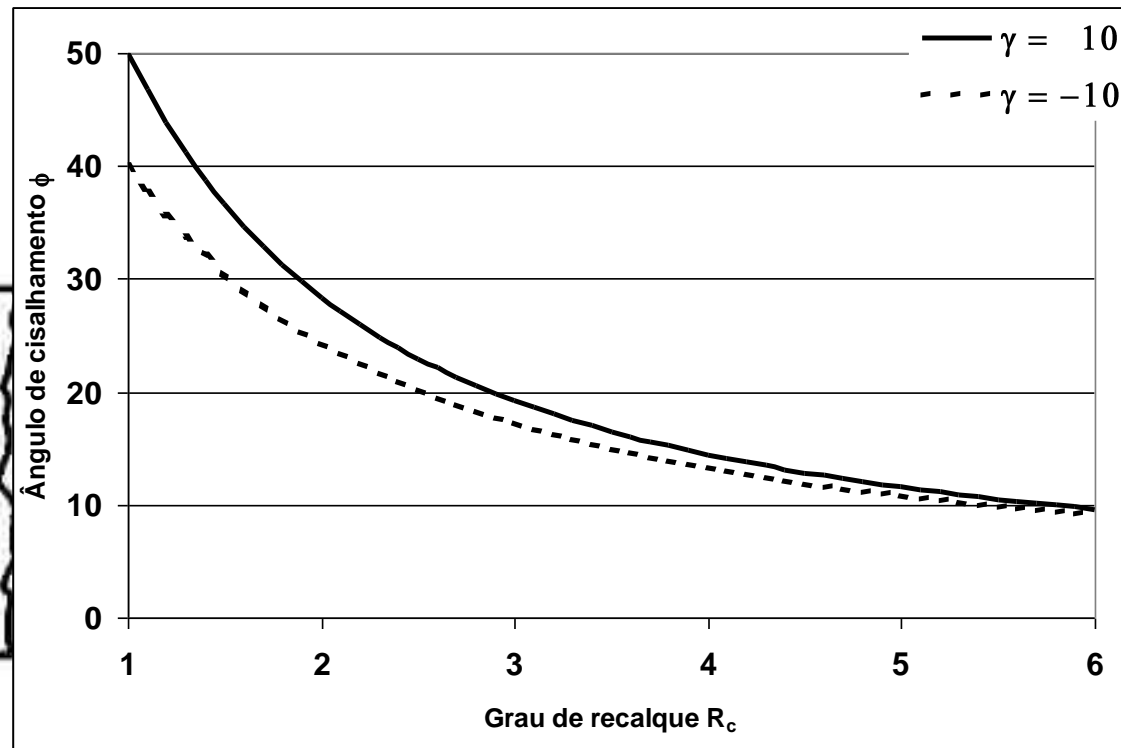
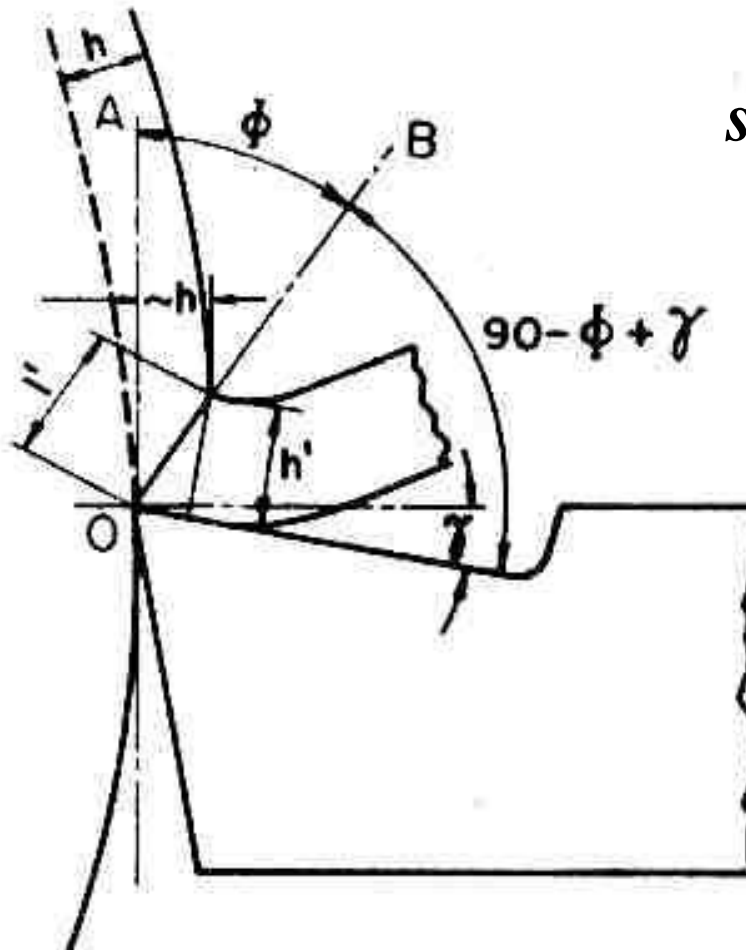
Modelo Teórico – Relações geométricas

$$\operatorname{tg} \phi = \frac{\cos \gamma}{R_c - \operatorname{sen} \gamma}$$

$$\operatorname{sen} \phi = \frac{h}{l'}$$

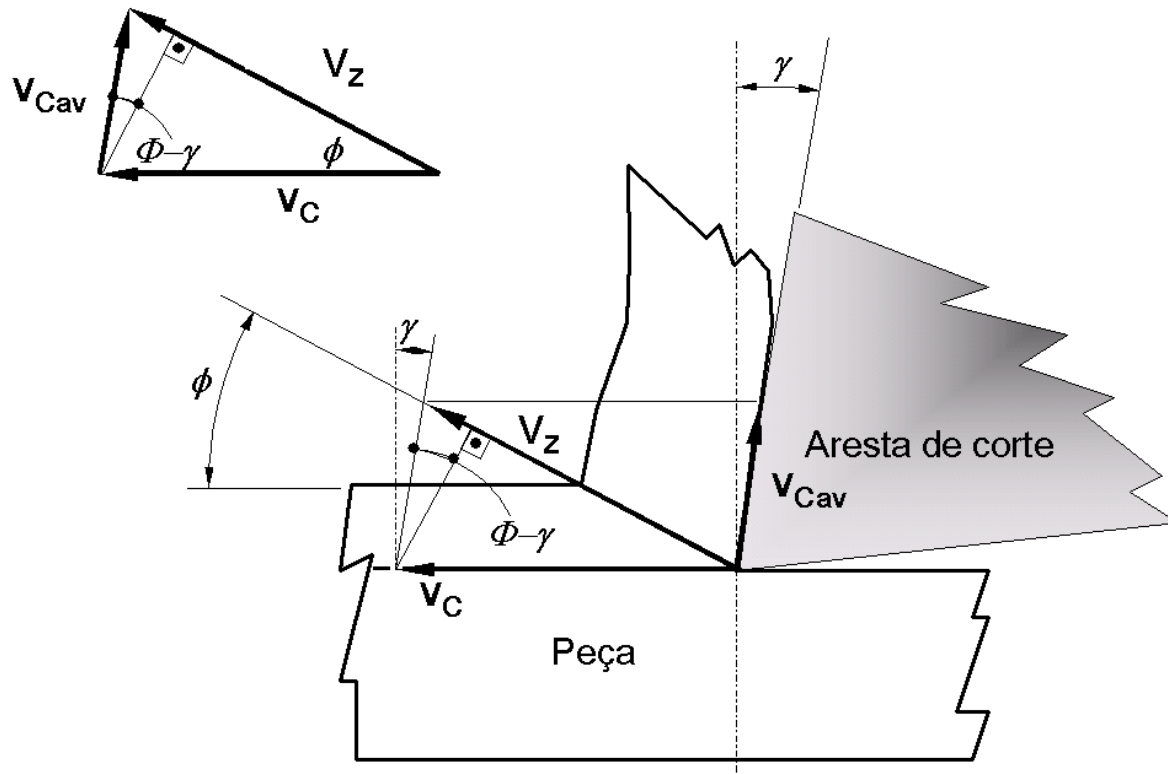
$$\operatorname{sen}(90 - \phi + \gamma) = \frac{h'}{l'}$$

$$R_c = \frac{h'}{h}$$



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Modelo Teórico – Relações de Velocidade



$$v_{Cav} = v_c \cdot \frac{\text{sen}\phi}{\cos(\theta - \gamma)}$$

$$v_z = v_c \cdot \frac{\cos \gamma}{\cos(\theta - \gamma)}$$

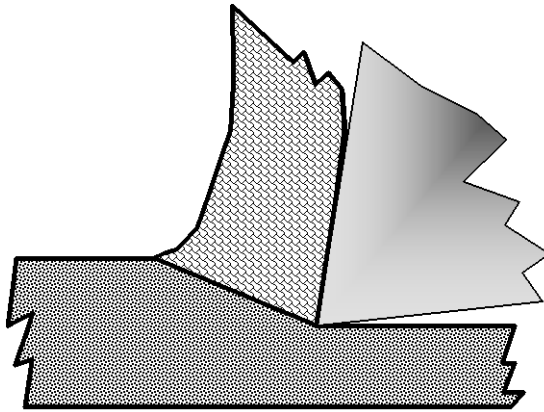
$$v_{Cav} = \frac{v_c}{R_c}$$

v_{cav} = Velocidade de saída do cavaco

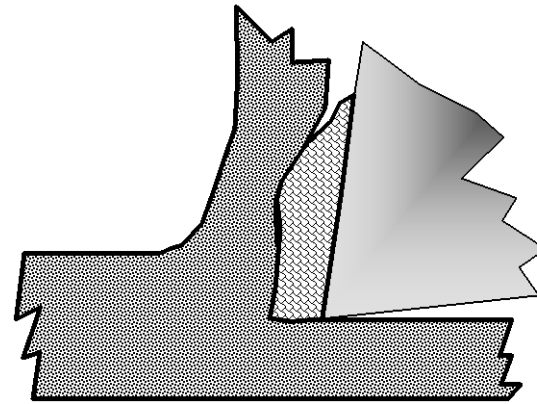
v_{cs} = Velocidade de cisalhamento

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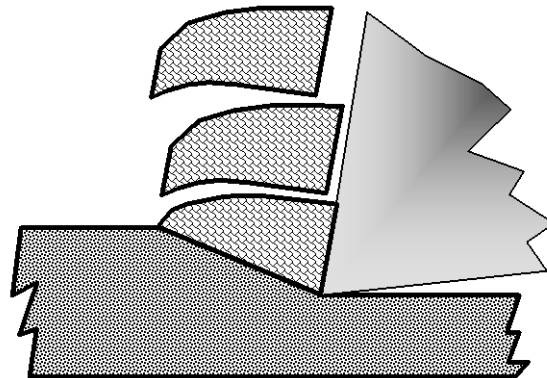
Tipos de cavacos e sua formação



(a) Cavaco Contínuo



(b) Cavaco Contínuo com APC



(c) Cavaco Descontínuo

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Formas de cavaco



(a) Cavaco em fita



(b) Cavaco helicoidal



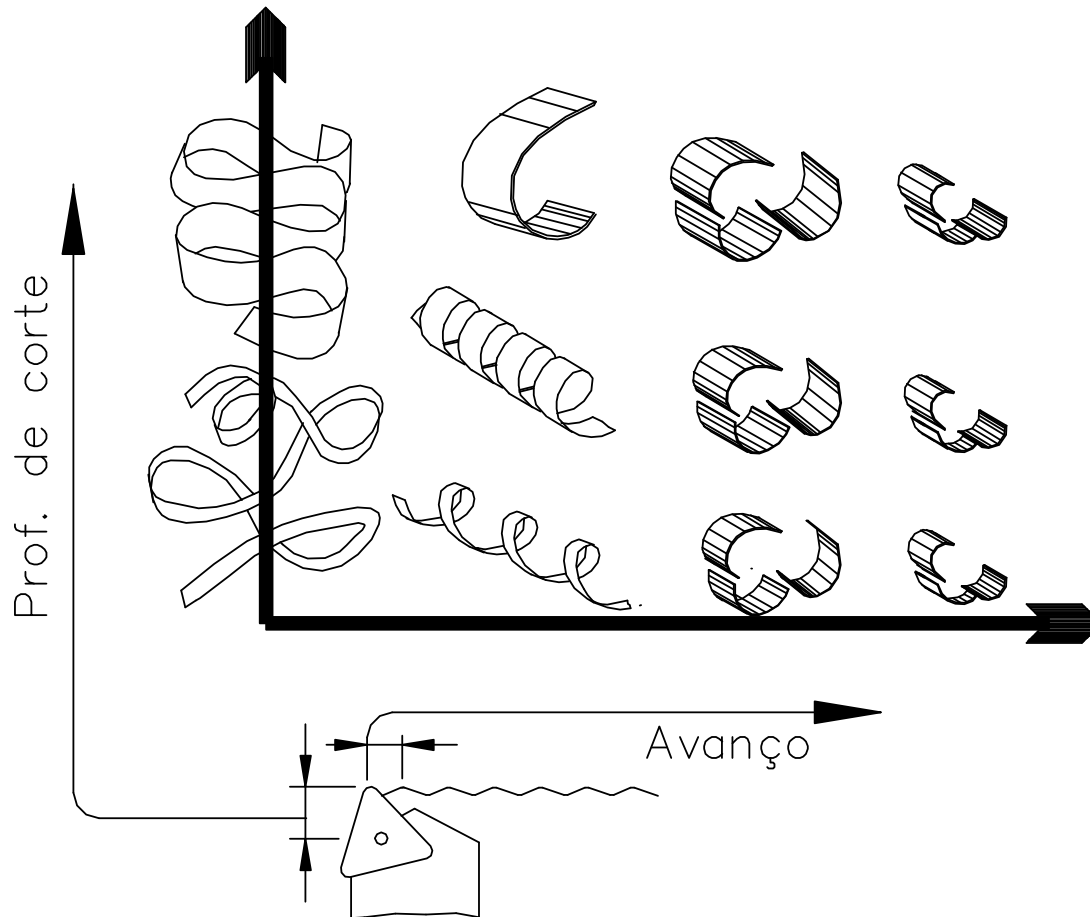
(c) Cavaco espiral



(d) Cavaco em lascas

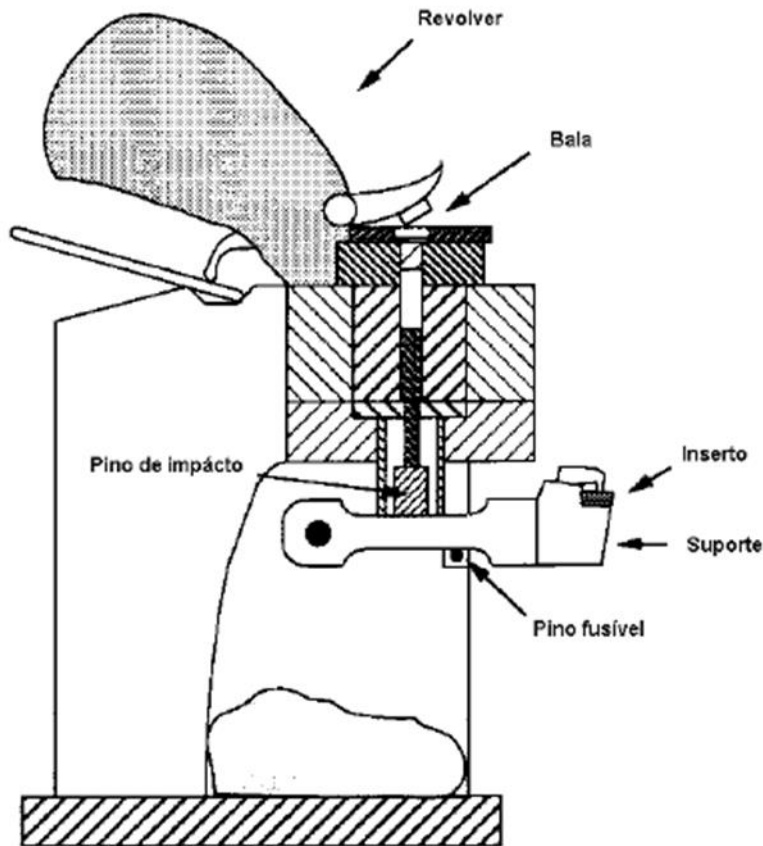
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Formas de cavaco em função das condições de corte

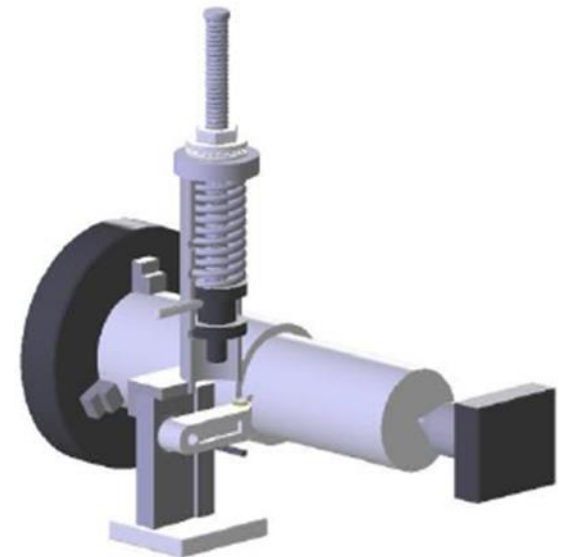


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Estudo da formação de cavacos – Quick Stop



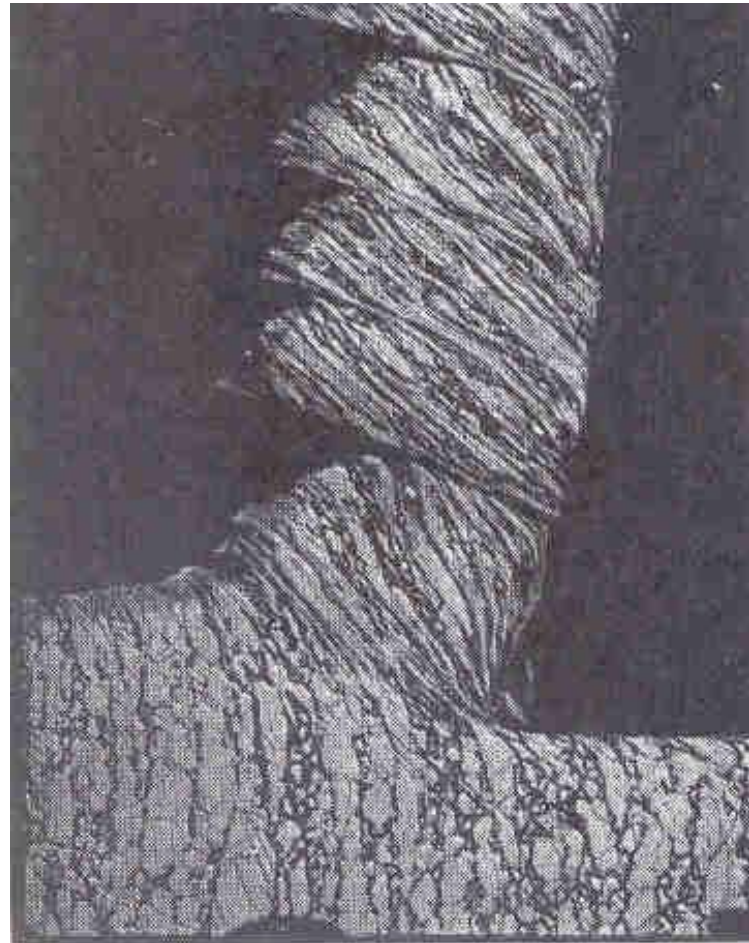
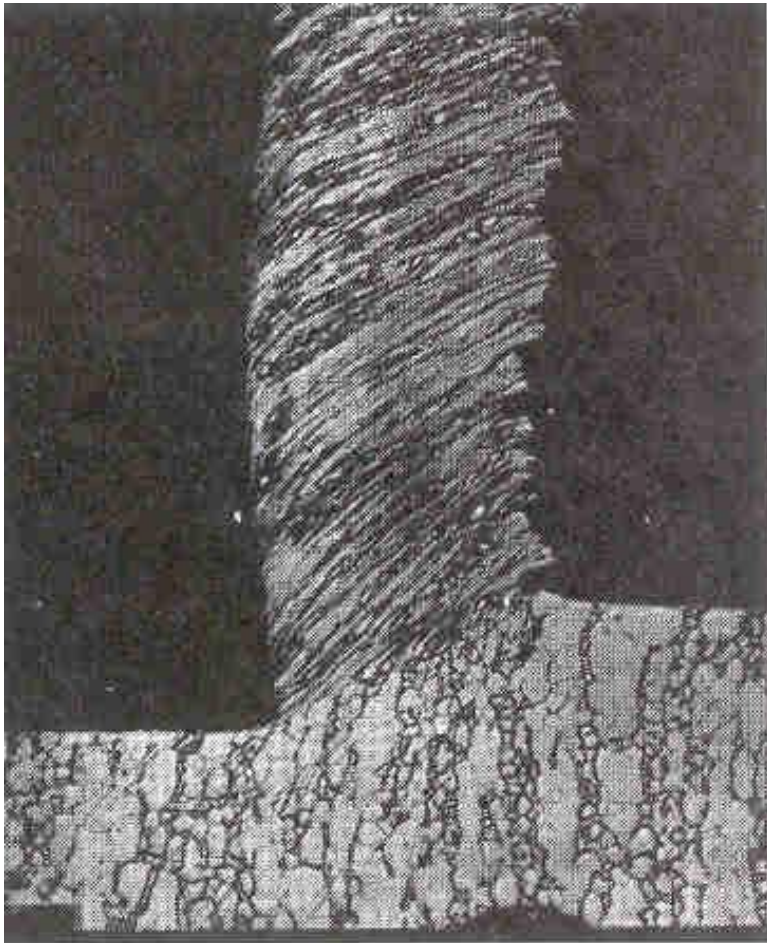
(a) Ruptura por explosão



(b) Ruptura por força de mola

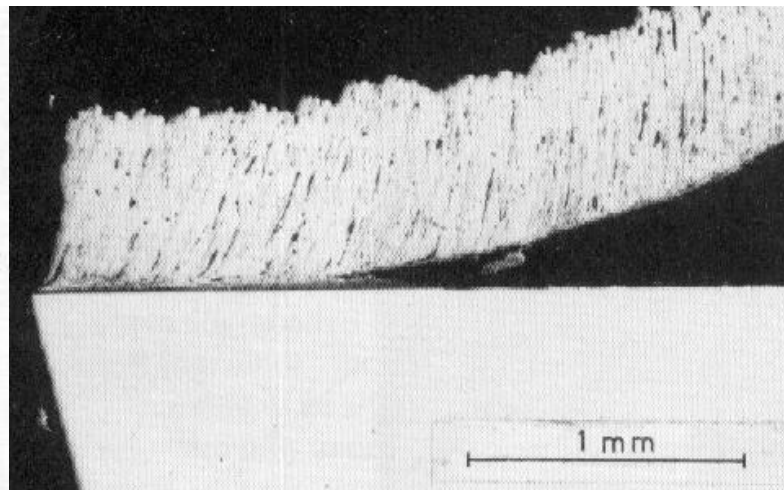
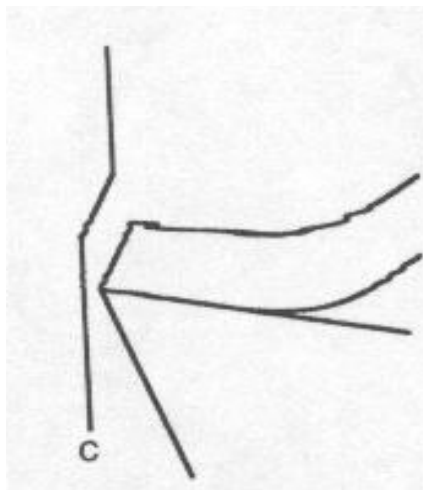
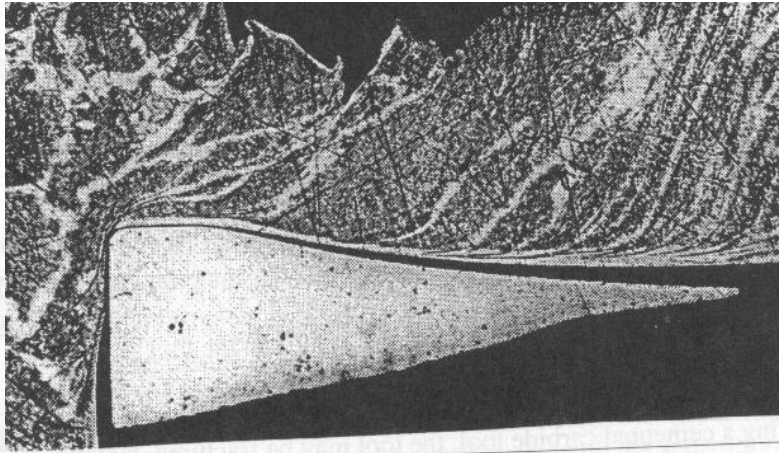
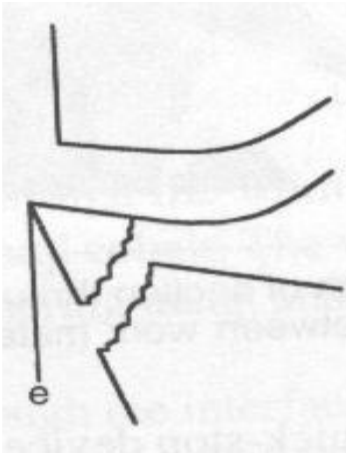
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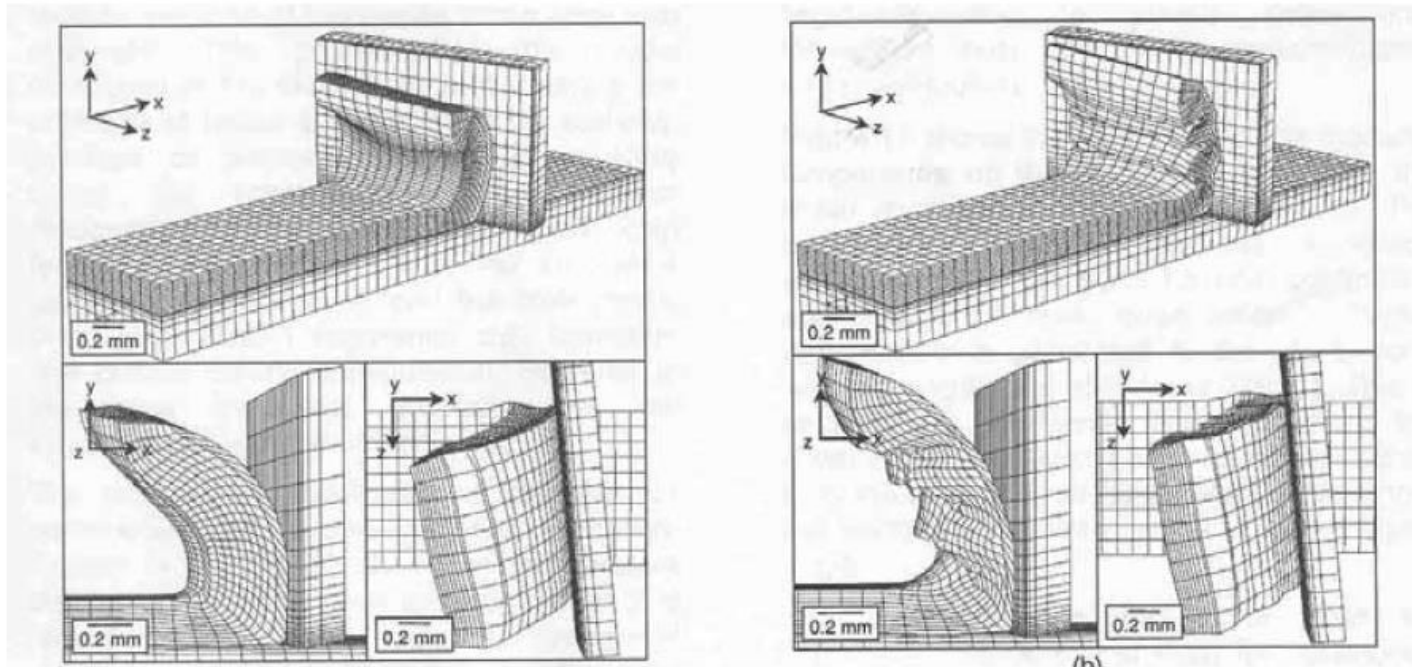
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Interface Cavaco-Ferramenta



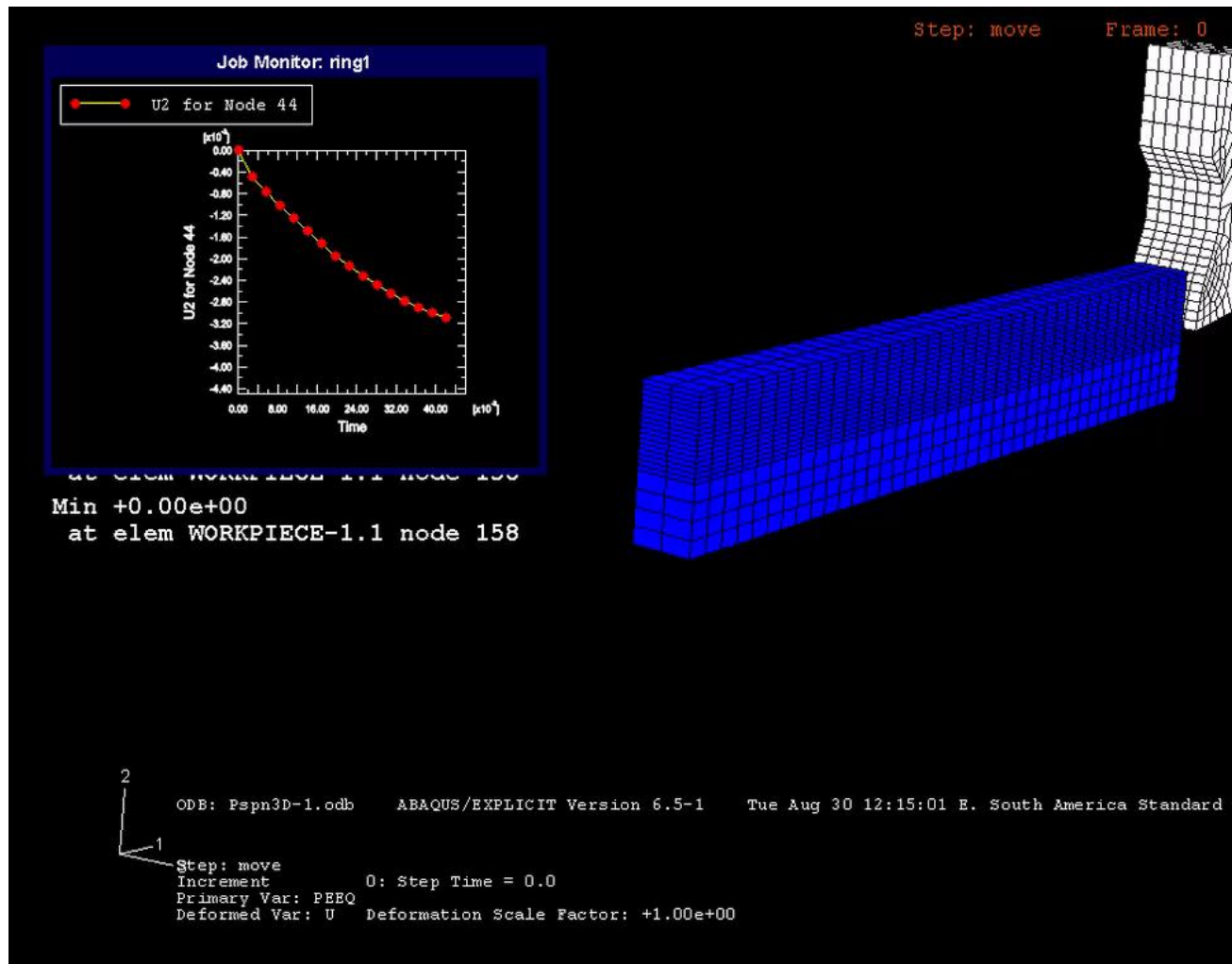
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Modelos de formação de cavacos em FEM



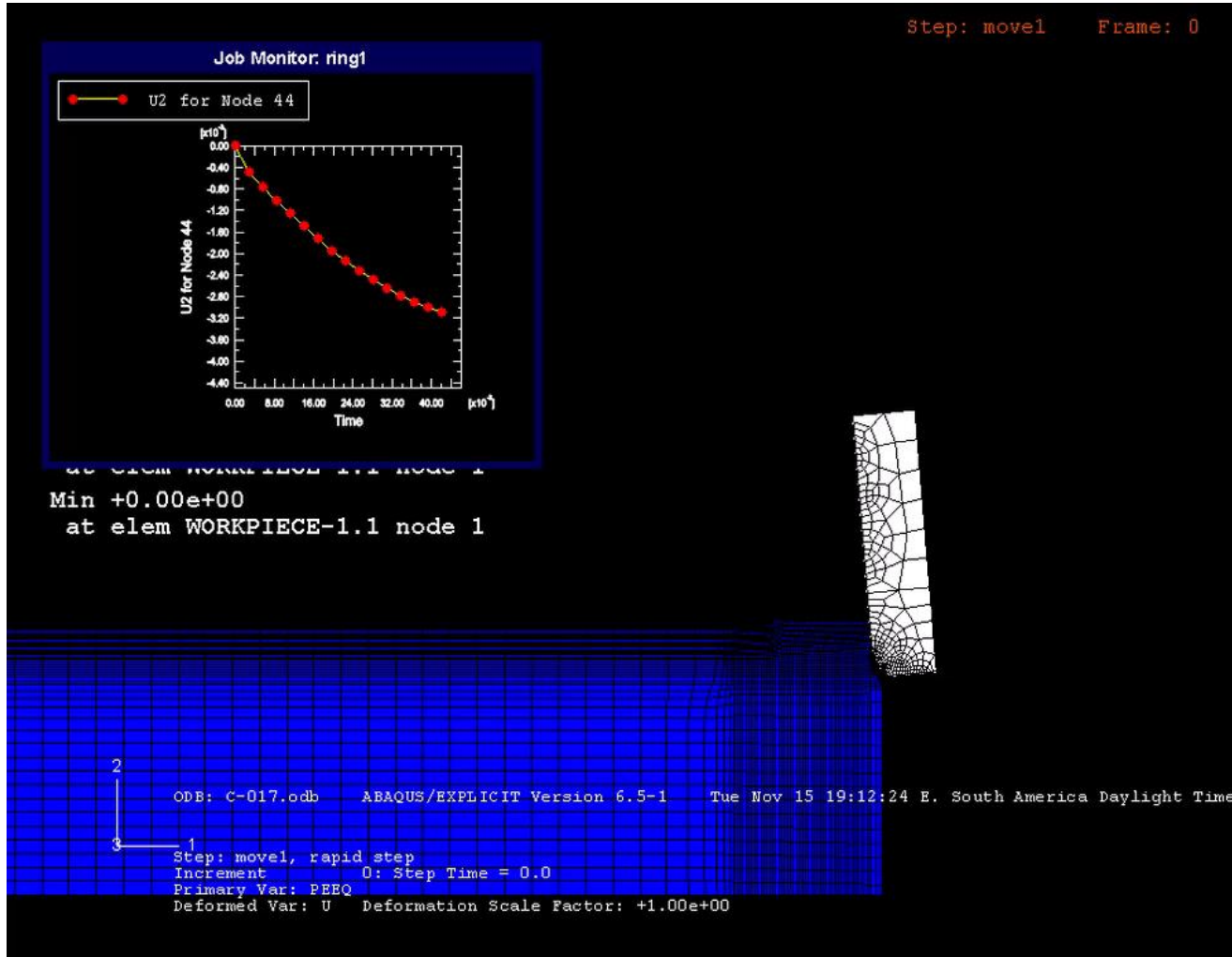
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