UNIVERSIDADE FEDERAL DE CAMPINA GRANDE
CENTRO DE CIÊNCIAS E TECNOLOGIA
UNIDADE ACADÊMICA DE ENGENHARIA MECÂNICA

ATIVIDADES DE PESQUISA E DESENVOLVIMENTO EM MATERIAIS COMPÓSITOS : PROTÓTIPO DE BLINDAGEM BALÍSTICA, ENSAIOS MECÂNICOS, ENSAIO NÃO DESTRUTIVO, ESTRUTURA AERONAÚTICA, PROCESSAMENTO

Wanderley Ferreira de Amorim Júnior, DSc.
Unid. Acadêmica de Engenharia Mecânica - UFCG

PROTÓTIPO DE COMPÓSITO PARA USO EM PROTEÇÃO BALÍSTICA

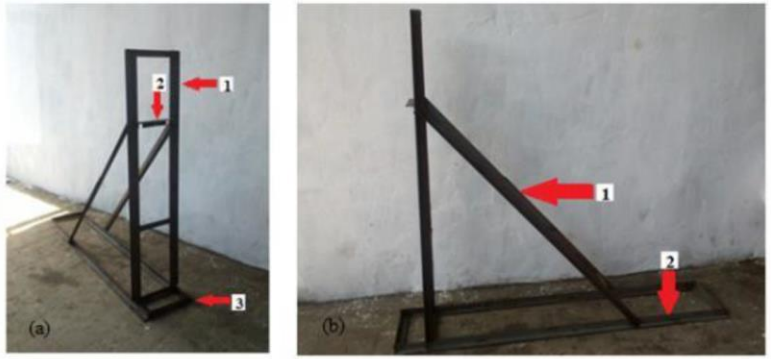


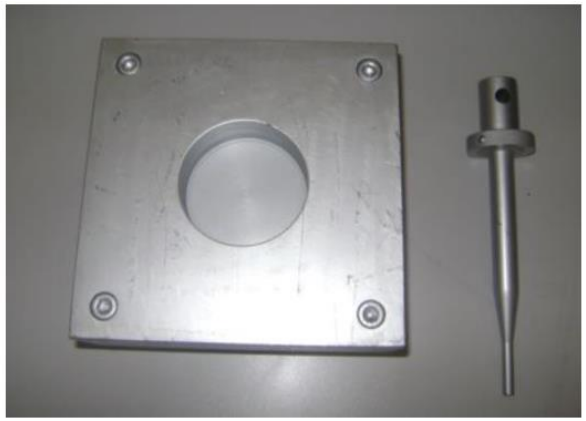
Figura 3.6 – Estrutura de suporte desenvolvida para os ensaios balísticos: (a) vista diagonal e (b) vista lateral.

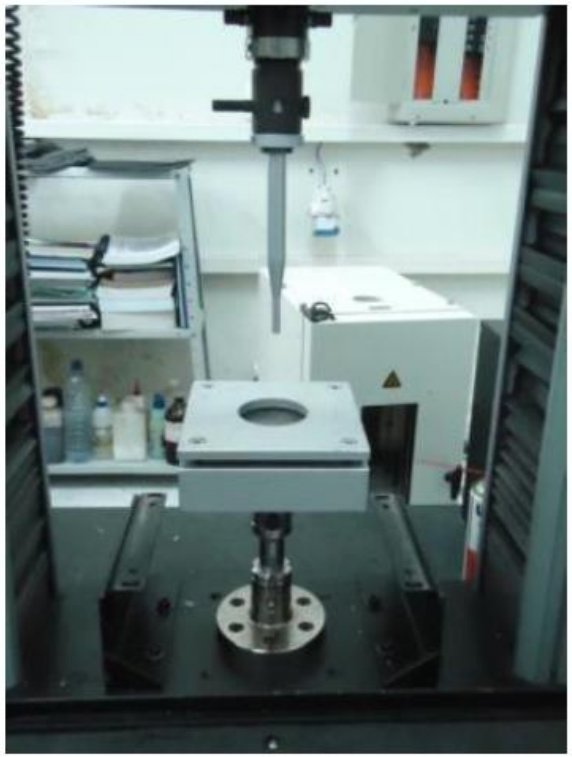
Figura 3.5 Esquema de fixação do alvo na estrutura

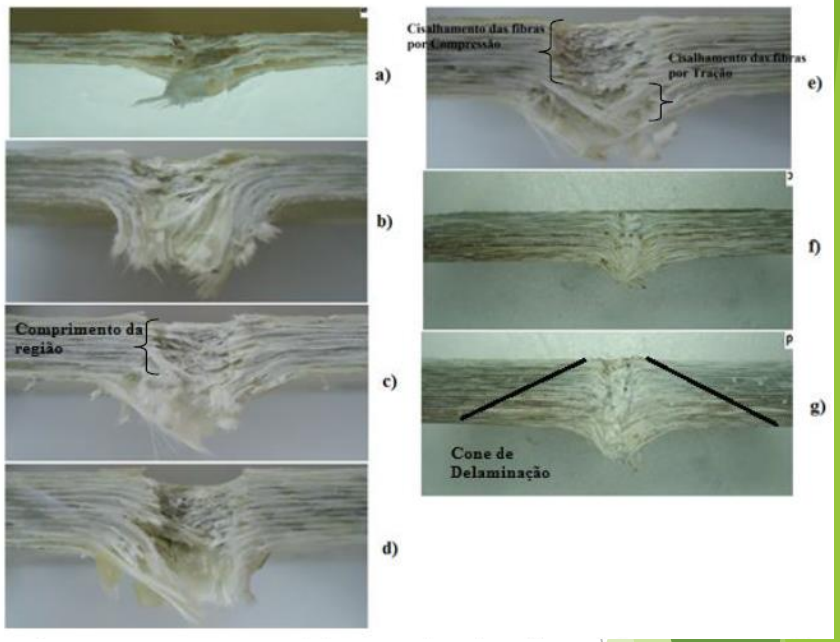
Figura 3.4 Munição 9mm Luger utilizado no ensaio Balístico

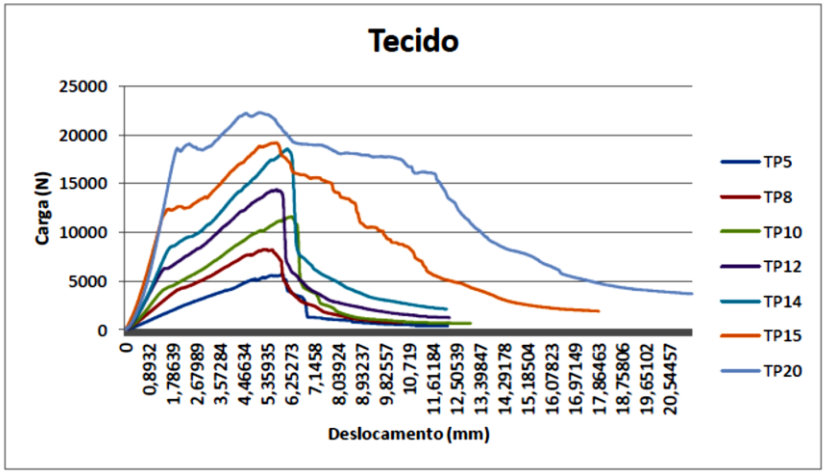
Deformed Projectile

PROJETO, FABRICAÇÃO E TESTE: ENSAIO QUASE – ESTÁTICO PUNCH SHEAR (QSPS)

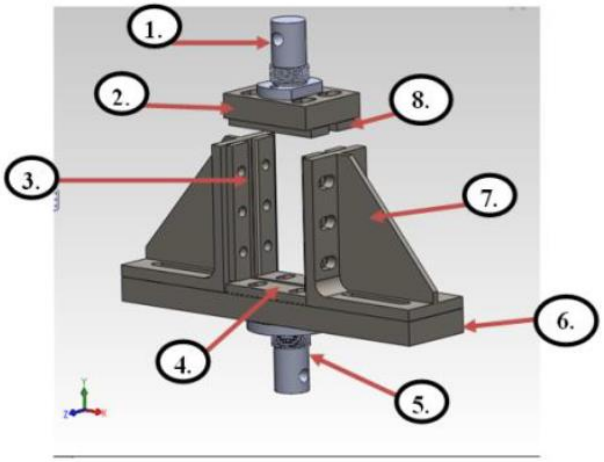


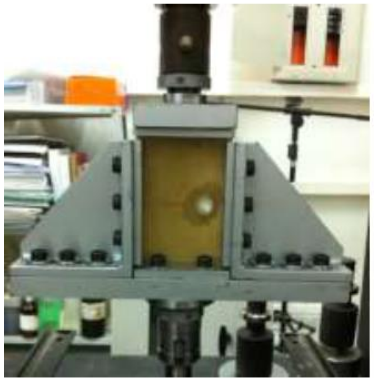


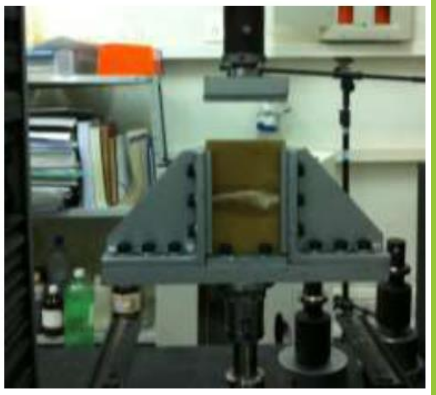


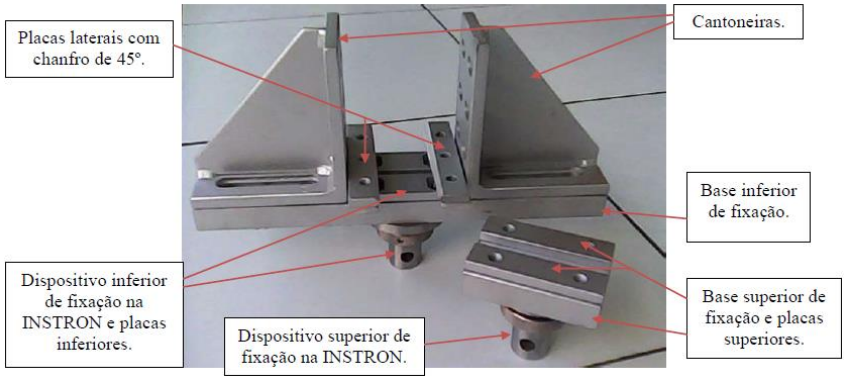


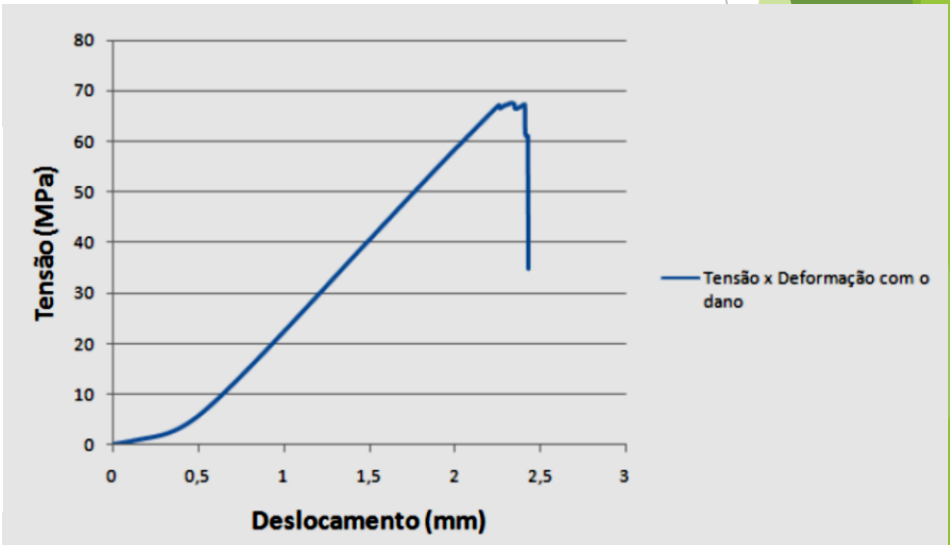
PROJETO, FABRICAÇÃO E TESTE: ENSAIO DE COMPRESSÃO APÓS IMPACTO (CAI)











DESENVOLVIMENTO DE UMA MÁQUINA DE IMPACTO POR QUEDA DE PESO PARA MATERIAIS COMPÓSITOS

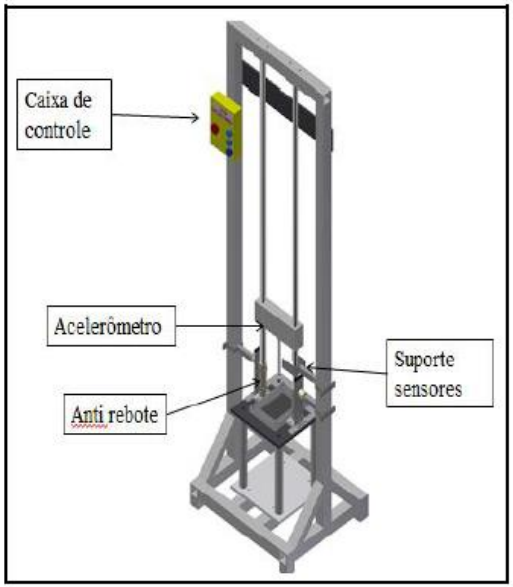
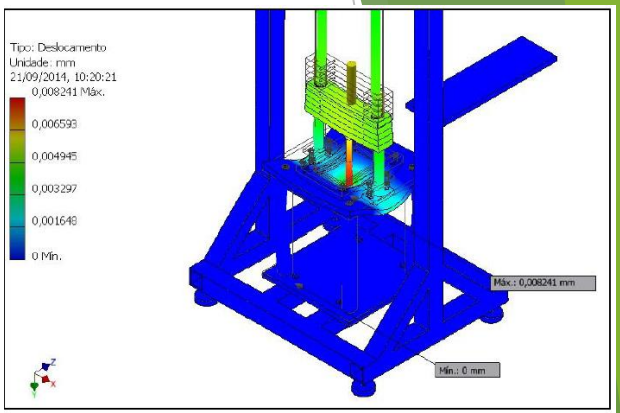
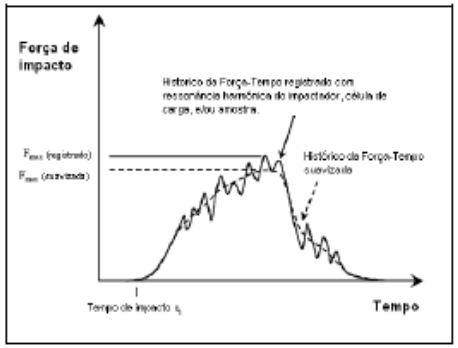
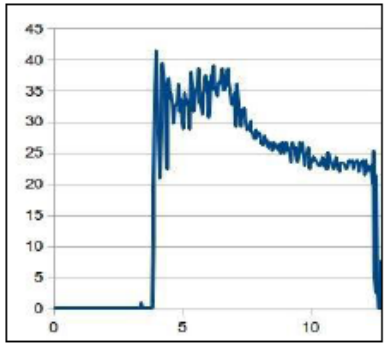


Figura 4.92 - Máquina de impacto por queda de peso desenvolvida na pesquisa.

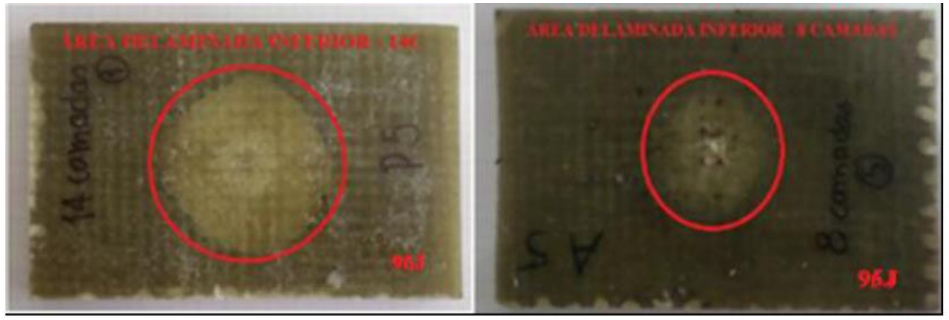






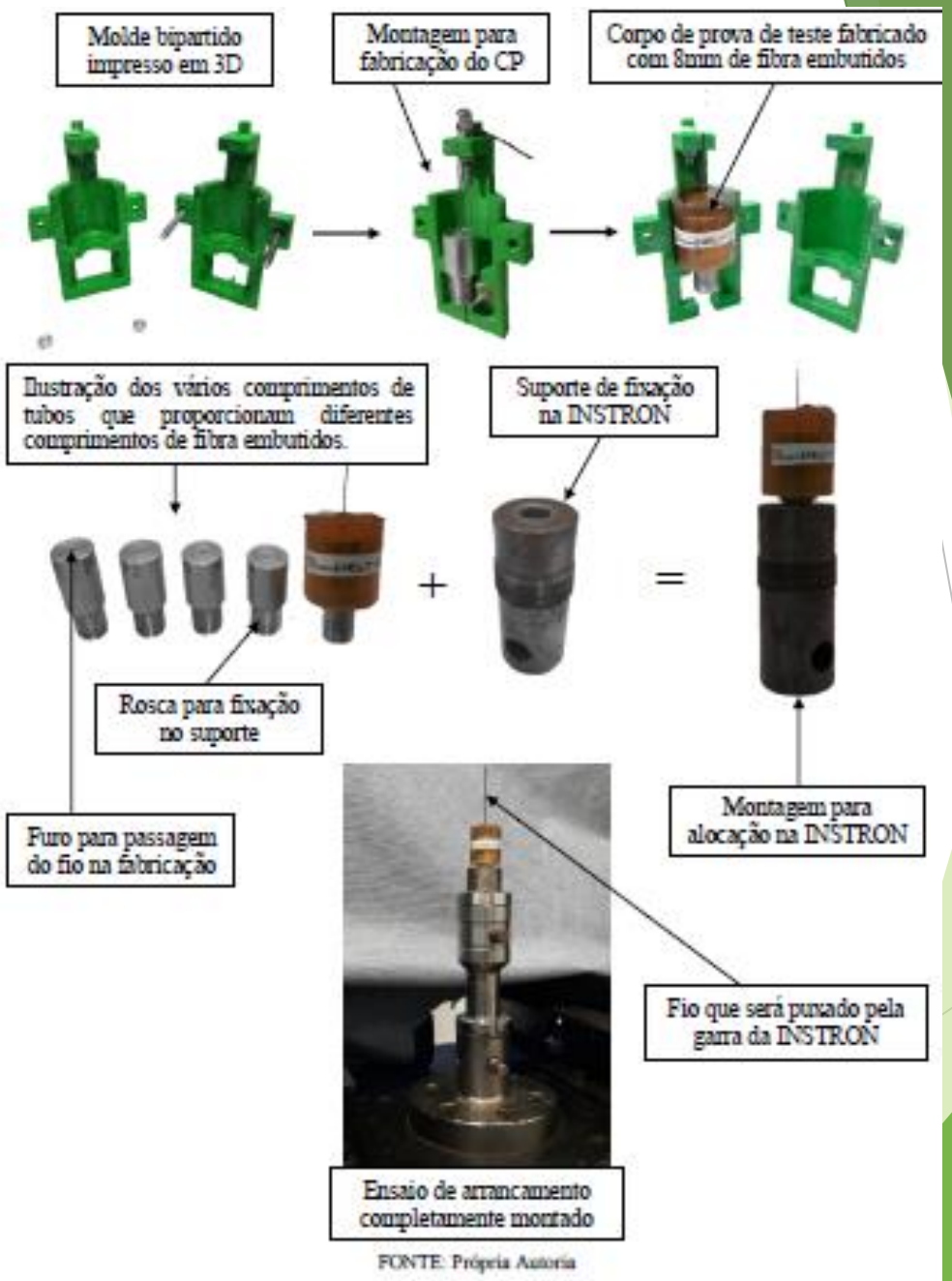
(a) (b)

Figura 4.86 - Gráficos da força de impacto em função do tempo (a) Exemplo (b) Obtido nos ensaios.



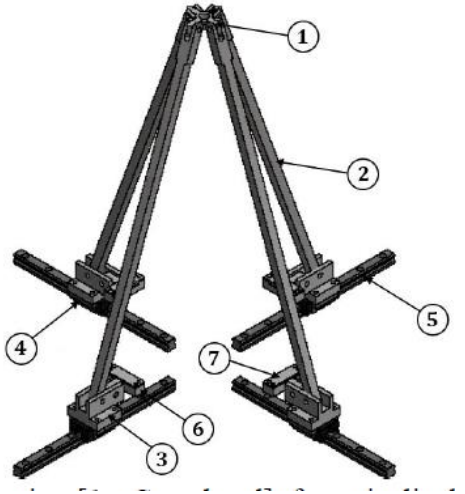
(a) (b)

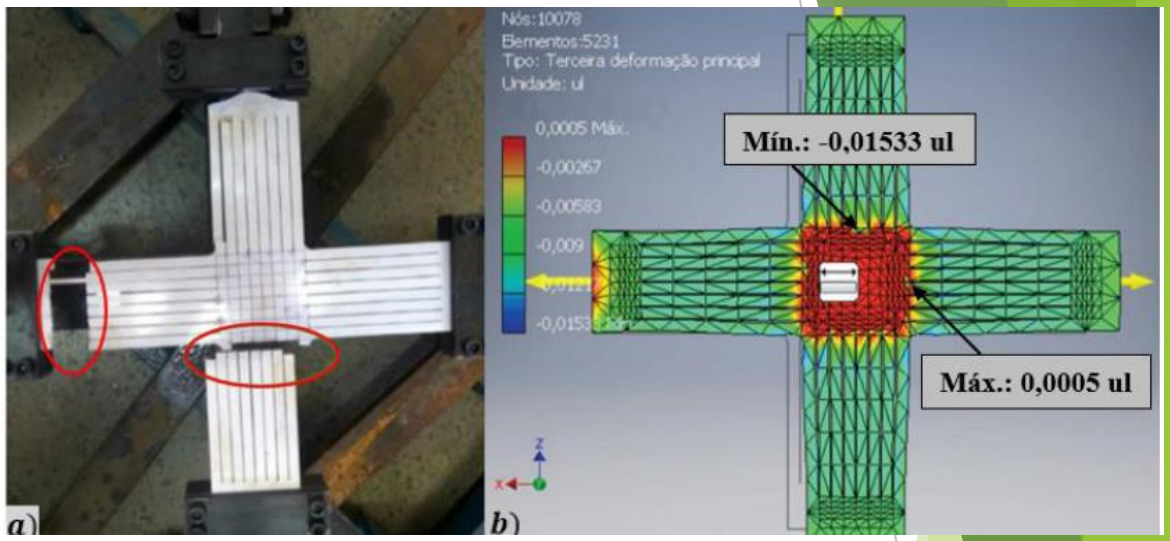
PROJETO, FABRICAÇÃO E TESTE: ENSAIO DE PULL OUT

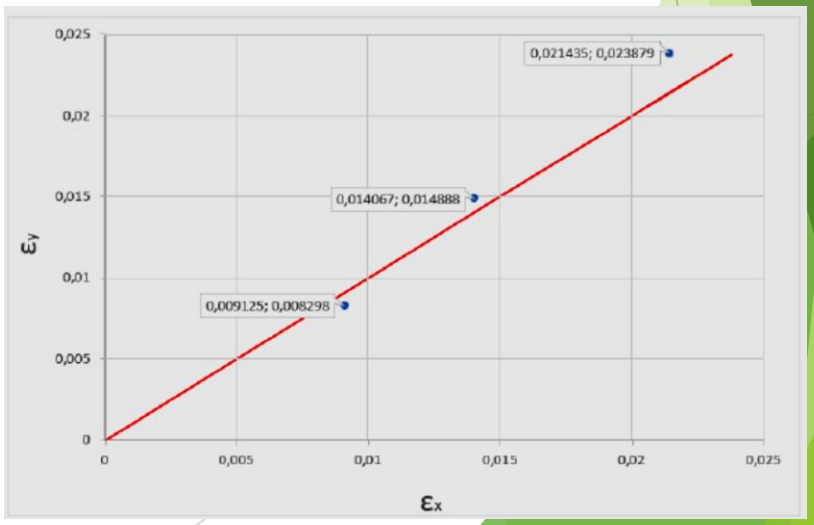


FONTE: Própria Autoria

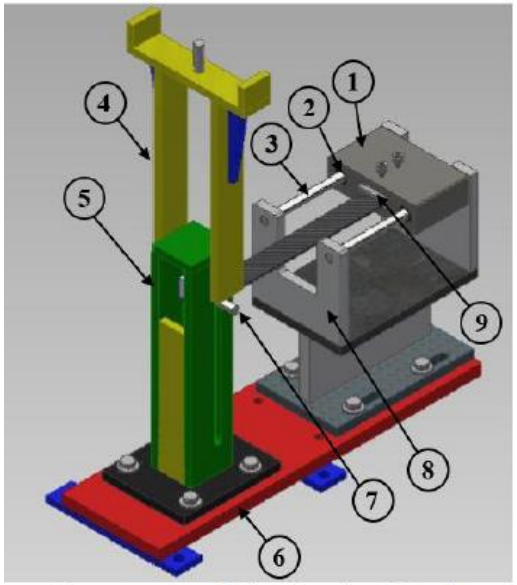
DESENVOLVIMENTO DE UM DISPOSITIVO DE TRAÇÃO BIAXIAL PARA ENSAIOS MECÂNICOS DE MATERIAIS







DESENVOLVIMENTO DE DISPOSITIVOS PARA ESTUDO DE FRATURA INTERLAMINAR MODO-I E MODO-II DE MATERIAIS DISSIMILARES



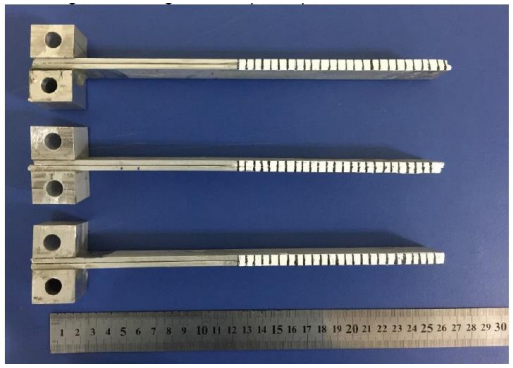
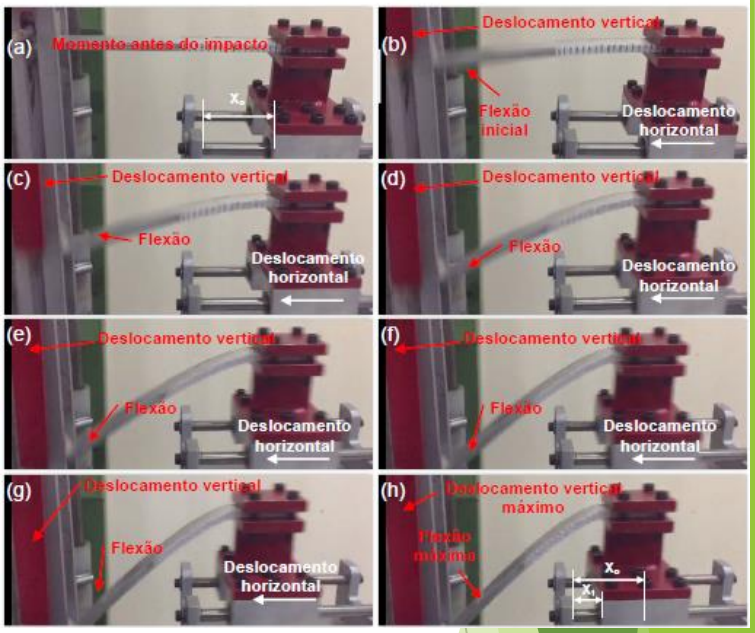
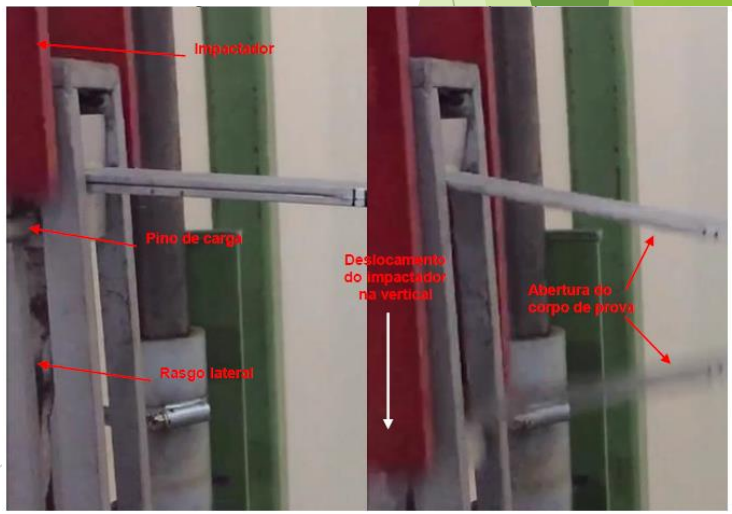


Figura 97 - Quadro a quadro do ensaio ELS com o corpo de prova CP_ELS03





DESENVOLVIMENTO DE GARRAS PARA ENSAIO DE CISALHAMENTO EM MATERIAIS COMPÓSITOS TIPO IOSIPESCU

Figura 112 - Protótipo confeccionado para o ensaio ASTM 5379.

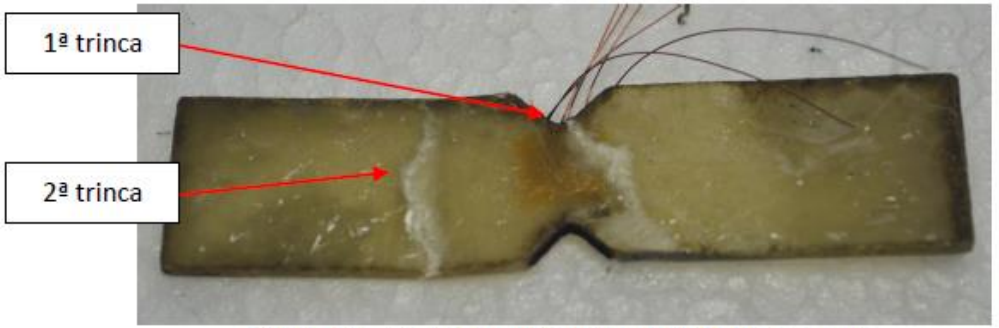


Figura 121 - Corpo de prova Iosipescu depois de ensaiado

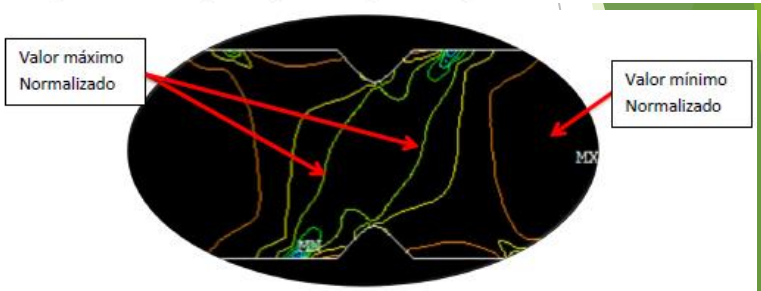


Figura 50 - detalhe da Região central do corpo de prova Iosipescu Simulado.

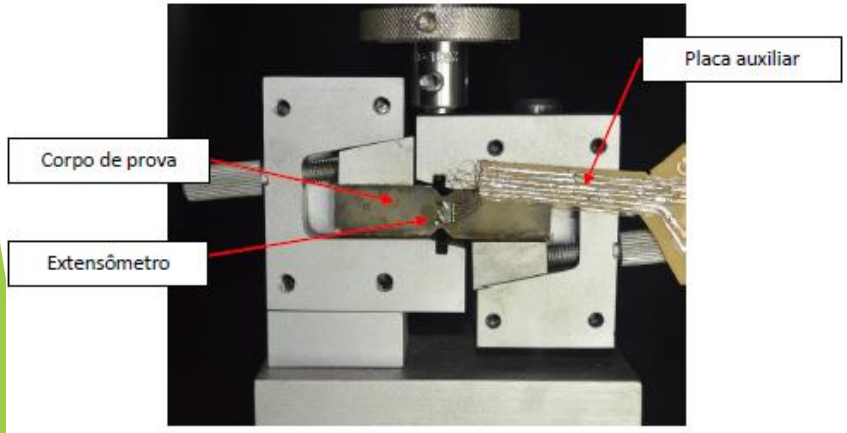


Figura 116 - montagem do ensaio Iosipescu.

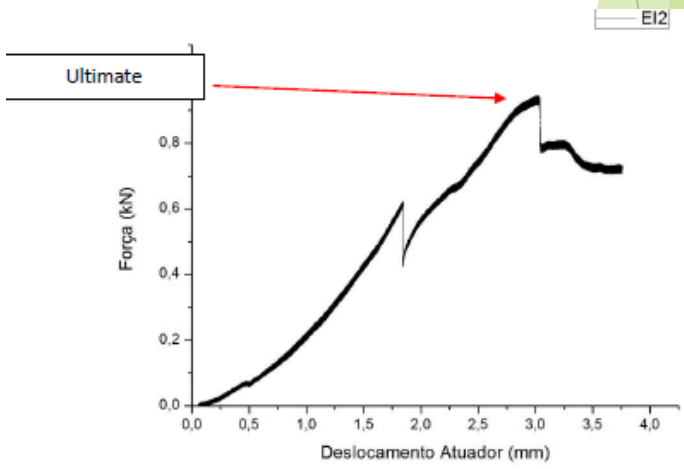


Figura 120 - Gráfico Força x Deslocamento do Ensaio Iosipescu.

DESENVOLVIMENTO DE GARRAS PARA ENSAIO DE CISALHAMENTO EM MATERIAIS COMPÓSITOS TIPO V NOTCHED RAIL

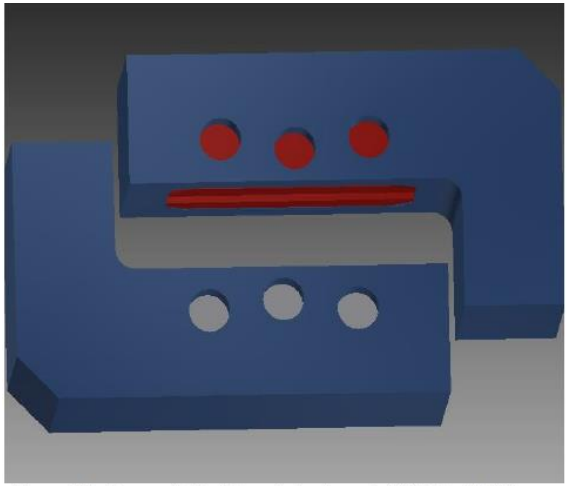
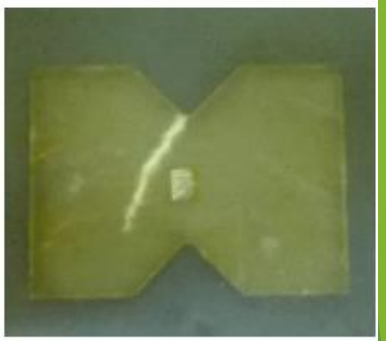


Figura 169 - Concepção final do conjunto de ensaio V-Notched Rail Shear.



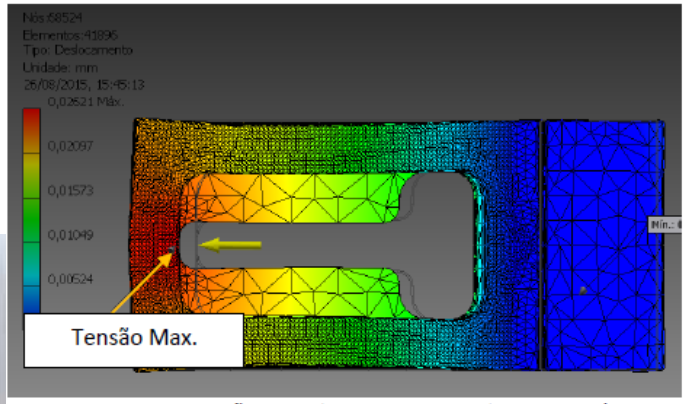
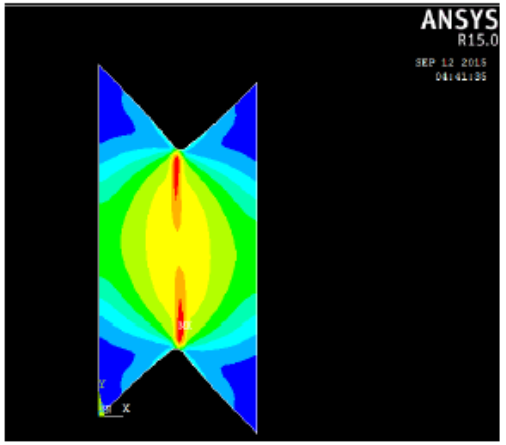
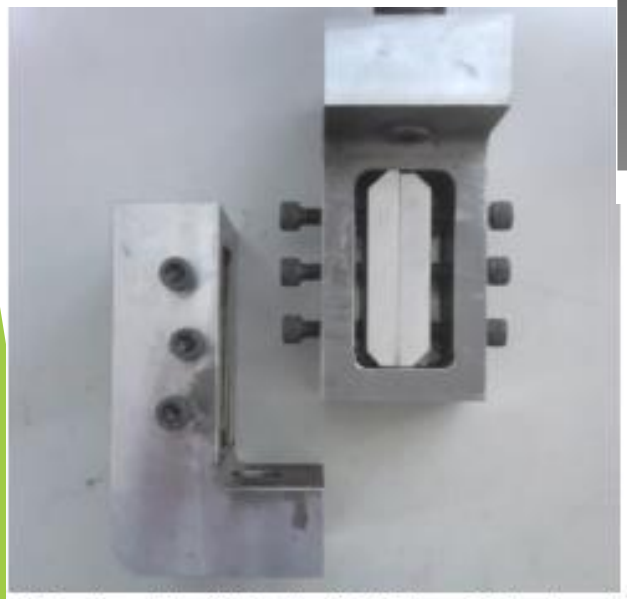


Figura 165 - Simulação computacional do elemento Fixador móvel.



ltado da simulação computacional do corpo de prova V-Notched R



173 - dispositivo V-Notched Rail Shear fabricado na UFCG.

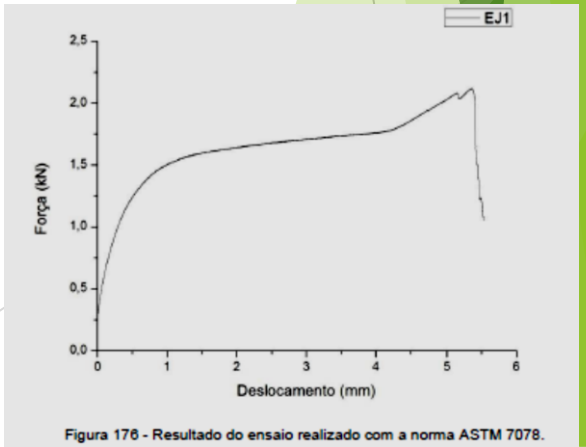
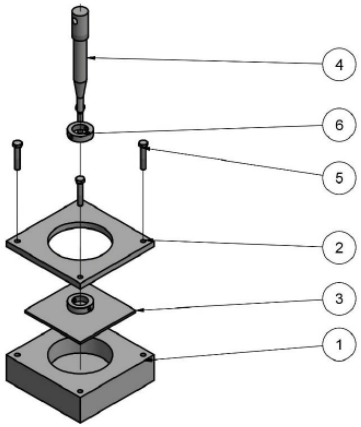
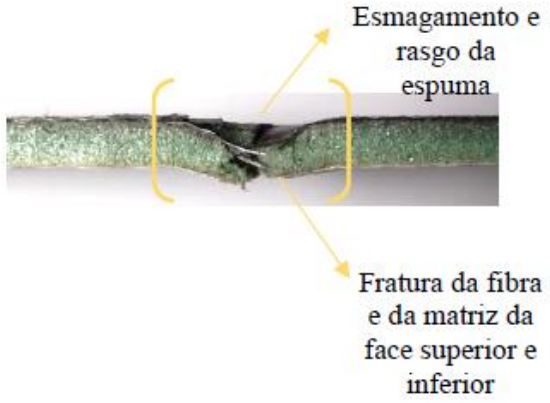
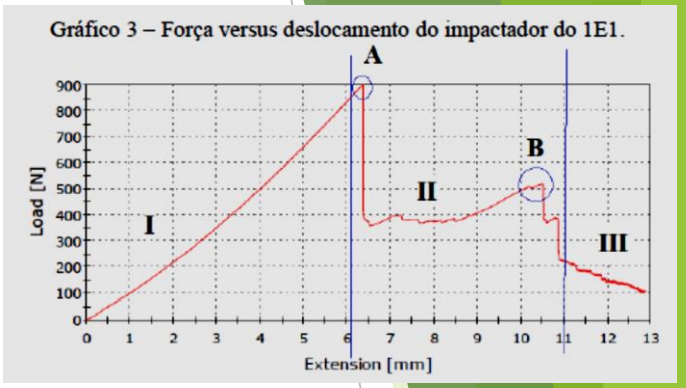


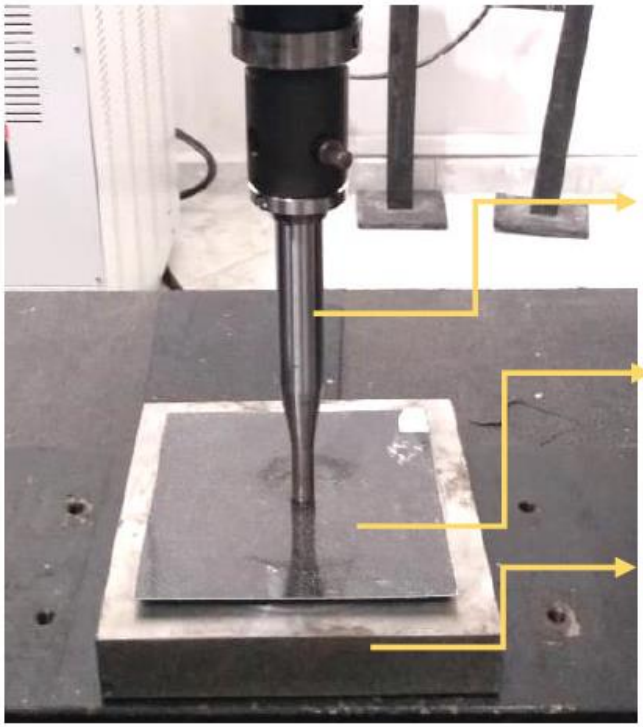
Figura 176 - Resultado do ensaio realizado com a norma ASTM 7078.

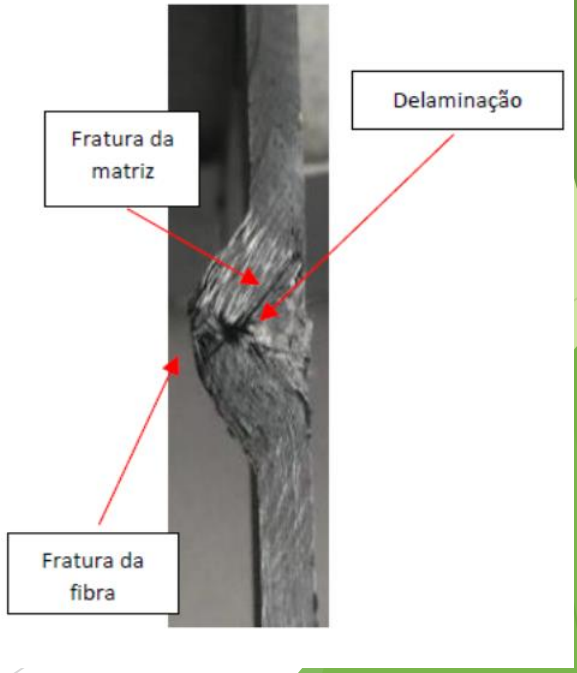
PROJETO, FABRICAÇÃO E TESTE: ENSAIO DE INDENTAÇÃO QUASE ESTÁTICA (QSI)





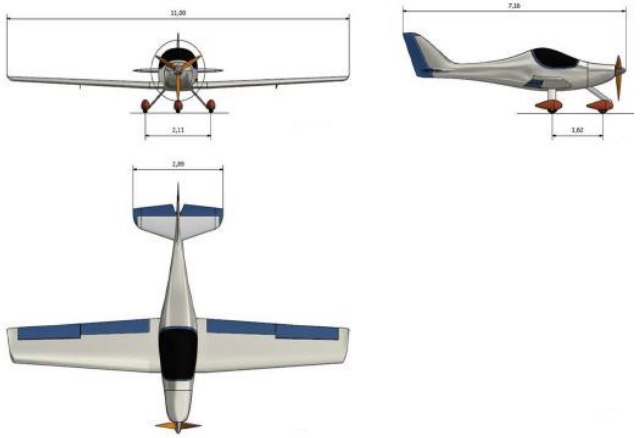






ANÁLISE ESTRUTURAL DE UMA LONGARINA COMPÓSITA PARA UMA AERONAVE ESPORTIVA LEVE

Figura 49 – Vistas principais da aeronave ST20.



Fonte – *Stratus* (2018)

Figura 76 – Deflexão total da estrutura: (a) "C" com diedro; (b) "C" sem diedro; (c) "I" com diedro; (d) "I" sem diedro; (e) em caixão

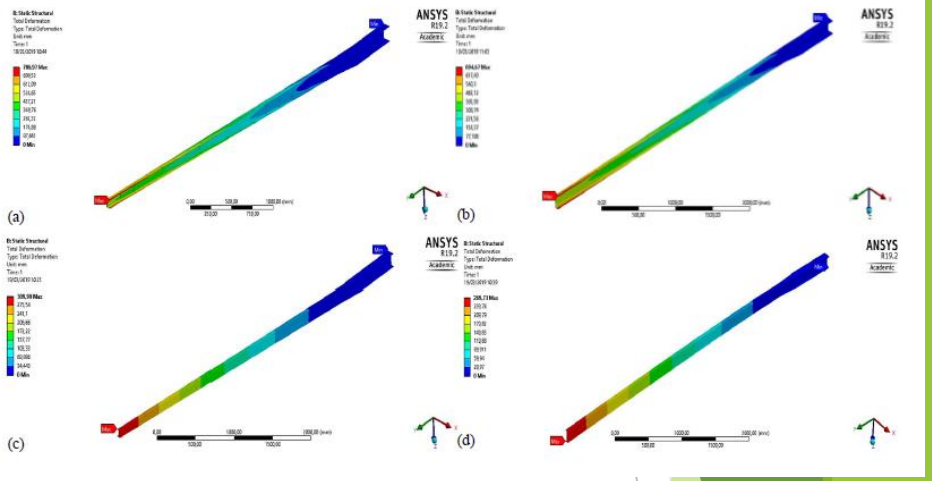
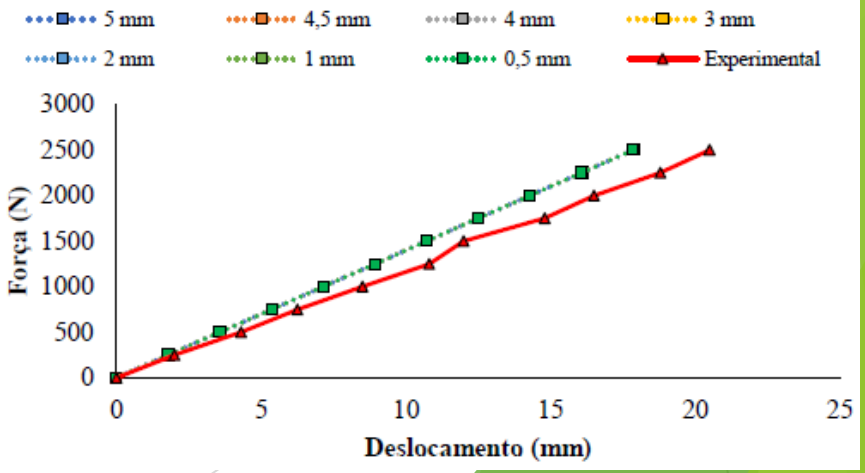


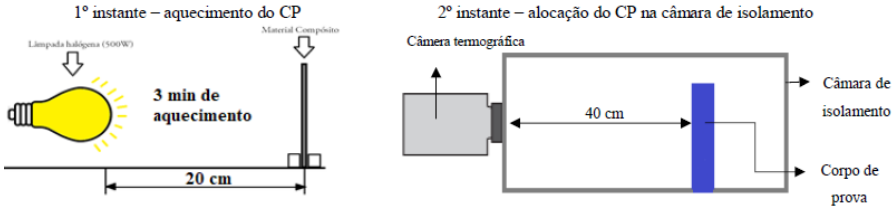
Figura 54 – Planos de simetria para a estrutura.

Fonte – Autoria própria (2018)



ESTUDO TERMOGRÁFICO DE DANOS POR IMPACTO EM MATERIAIS COMPÓSITOS

Figura 65 – Ensaio termográfico.

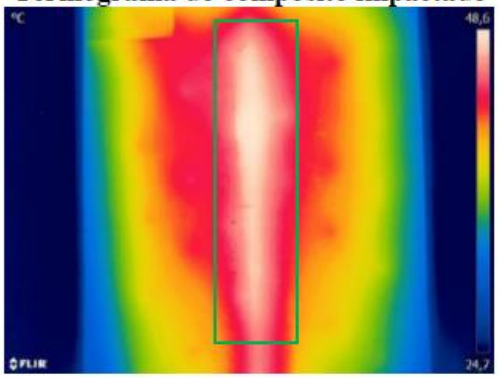


Fonte – Modificado de Batista et al (2019).

(c)

15,9 J

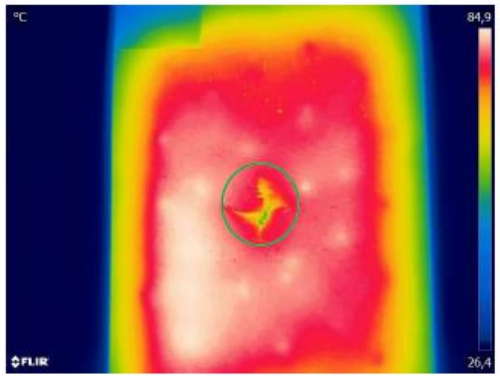
Termograma do compósito impactado



Fonte – Autoria própria.

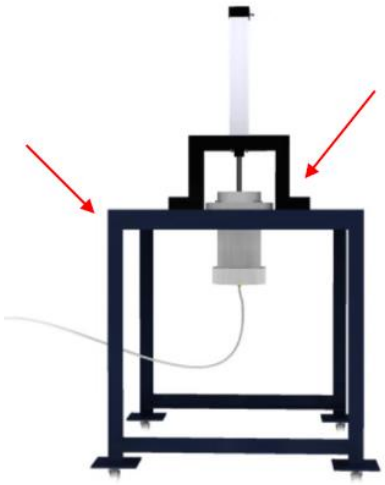
30,9 J

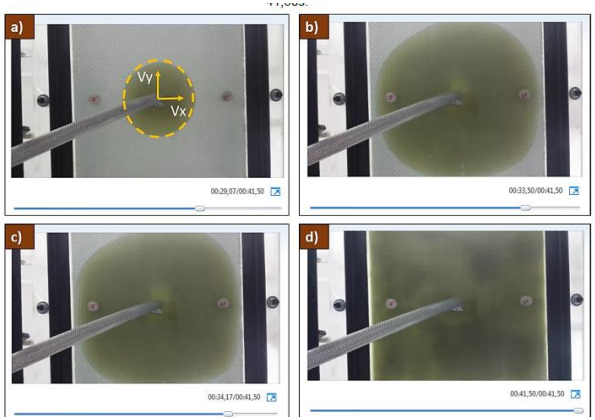
Termograma do compósito impactado

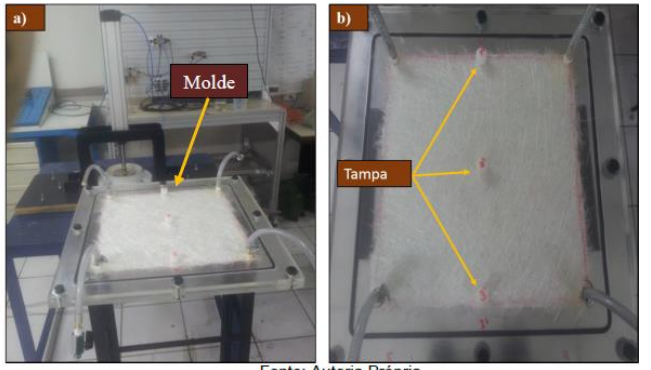


Fonte – Autoria própria.

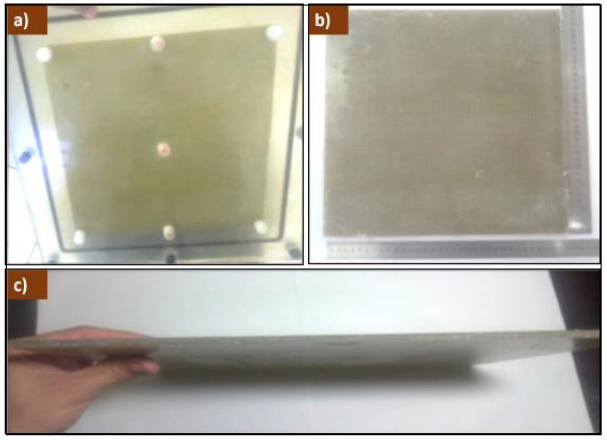
DESENVOLVIMENTO DE UM EQUIPAMENTO DE MOLDAGEM POR TRANSFERÊNCIA DE RESINA PARA USO LABORATORIAL







Fonte: Autoria Própria.



Estudo do processamento de materiais compósitos com inserts impermeáveis embebidos via RTM

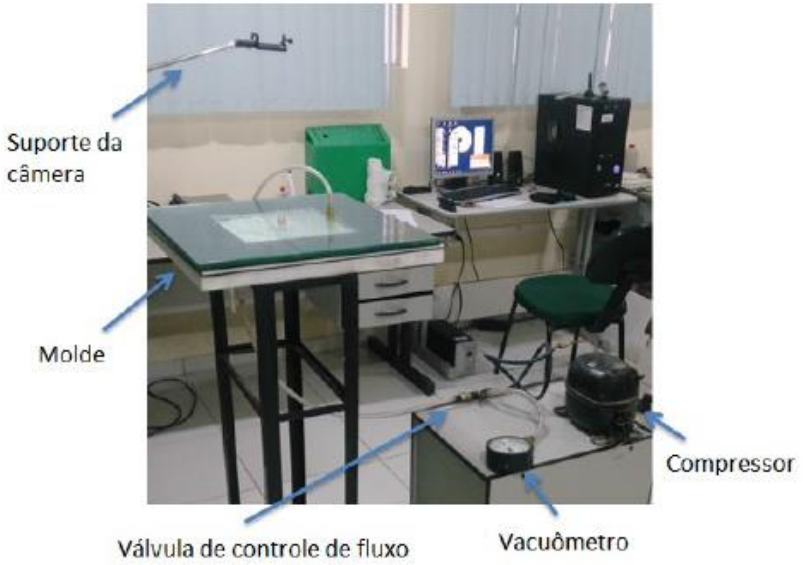
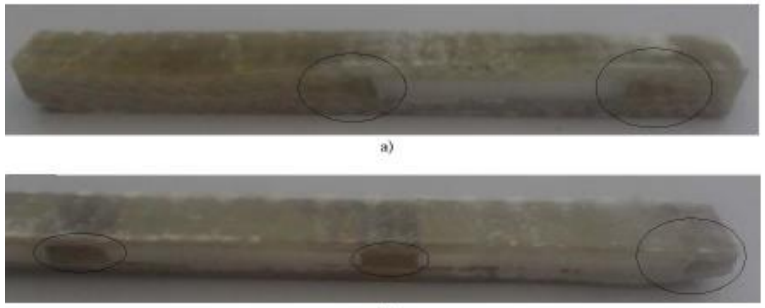


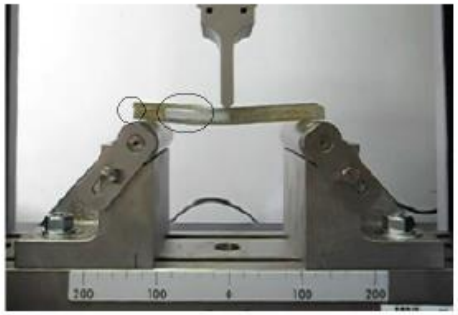
Figura 109 – Placa PVR-6: (a) vista superior e (b) vista inferior

a)

b)



a)



b)

CONTATO:

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