

# Measurement of defects in carbon fiber reinforced polymer drilled

Victor 3 D V F M a n u e l 6 D Q Ó x c r Q 0 D U W t Q a n c D c G D Q W R V

0 D Q X I D F W X U L Q J 8 9 D Q L W F K H O D Q G N V L U D I G C H V 9 D Q Q D F B O L G ( V S

**Abstract.** , Q F U H D V L Q J O \ I D E W H U U B D Q \ I D W F H E R R J H Z L G H O \ X E H F D X V H R I W K H L U J R R G P H F K D Q L S F L D H F I S V R S M U K W H L V H V , W P D W H U L D O V W K U R X J K V F U H Z V D Q V R U P L D Y H H W D K I R O H Z K L F K L Q W K H S L H F H X V X O I O R I B A K G H U S O B E O H P A L G H X V L Q & W K H D S S H D U D Q F H R I G H I H F W V G X H W R R E W K W H D N D H F K L Q L Q J L Q W R D F F R X Q W Q V M I O H F L C O D D P L L Q C B W B B G H H Z / K S I R R U W R O D V V H P E O L Q J S D U W X F W X H G X F L Q W W X G I G V D U R I D W K Z L S Q U W K L J K Z H D U D V D V H U L H V R I V W U Z V V B X F D U K D M Z K H Q P R E H H Q S X E O L V K H G D E R X W G H O D P L Q D W U R Q V D Q G W K H D S S H D U D Q F H V R Z H D U H Q R W J R L Q J W R I R F X V R Q L W T X D Q W L I \ D Q G P H D V X U H W K H G H I H F W F S B X V Q F M D W H G Z L U H L Q I R U F H G Z L W K F D U E R Q I L E H U H W H Q V U X I O H D V L Q Q W R H D F K F D V H ) R U W K L V S X U S R V H D D S S W L F D O R R H D V X U H G L J L W D O L P D J H S U R F H V V L Q J Z L O O V Z B U X V H G W K U R X J K '

## 1 Introduction

7 K H X Q L R Q R I S L H F H P D V P D G I H D O V W R K I W K H I H U W U S H O F B U E R G S & ) 5 3 L V P D G H P D L Q O \ E \ V F U H Z V H D / Q G U A L W R W G U L I Q O Z K L S L H F H V , W L V R I Y L W D O L P S R U V P D C F H D Q R S Z W X G \ V K R Z L W I L Q D O J H R P H W U L H W B O H I U E B F B X V R I R W K H V D D Q / G I P E I O H S W L Q W H J U L W \ R I W K H D V V H P E O \ Z L O Q E G H S M Q / G H R Q / W K H I Q D S D U H D V W K H V F U H Z V R U W K H U L Y H W V > @

## 2 Experimental Procedure

) R U W K H G H Y H O R S P H G D U E R O K H E V W M G H S O D R W I F H Z O S R O H G W R W K H P D W H U L D O X V H G L Q W K H Q D I H U R V Q B X W K F D H C H L O D E X R I W K H W D I I H W D W \ S H Z L W K I L E H U H V D W 7 K H E B W Z H O I D \ M U K W U H D W P H Q W W R U H G X F H W K H G H O D B R L Q I D W L Q Q V D I W W K H X I R F X V R Q W K H G H O D P L Q D W L R Q W R S W B A V H L C W G D L Q F M K S H M W K U H H G U L O O V W Z R R I W K H P Z H U H U H I Q X D O S O D Q G W K H I H R \* • K U L Q J E U D Q G F D Q I G Q Z G I L D P H G V H E R E D O W F R D W H G 7 K H C U H V L G H G L Q W K H J H R P H W U \ W K H D Q Q C H W S H F W K H Y I S Q L Q

& R U U H V S R Q [G I L Q W B X S K R U F X D O # X Y D H V](#)



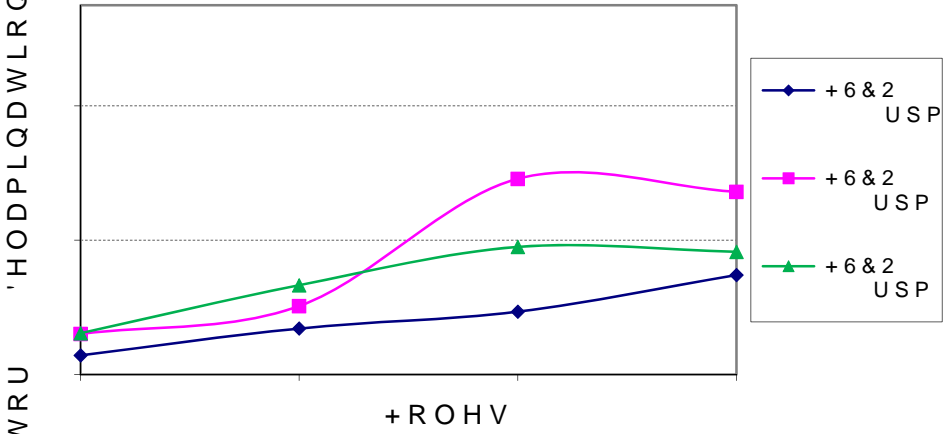


Fig. 1. 'ULOOV SHUIRUPHG DW PP UHY

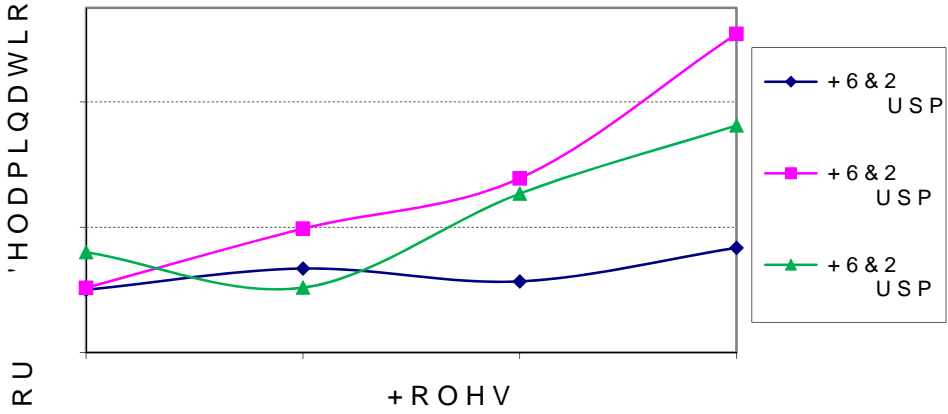


Fig. 2. 'ULOOV SHUIRUPHG DW PP UHY

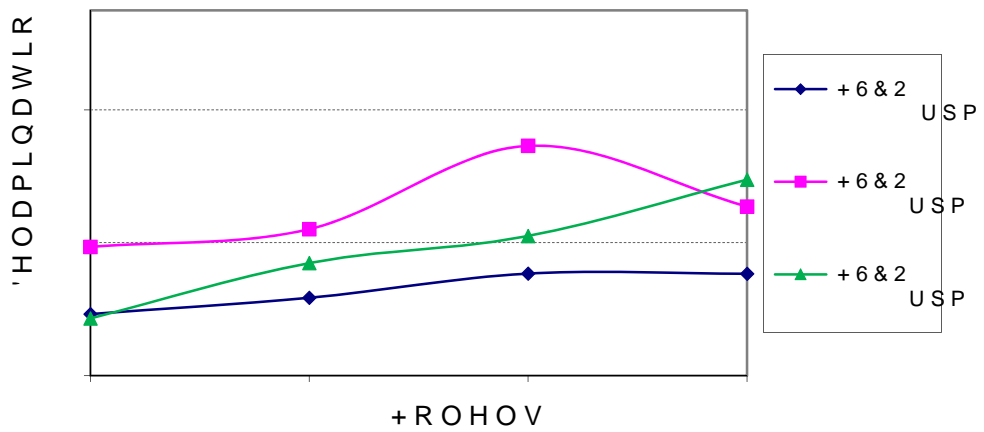


Fig. 3. 'ULOOV SHUIRUPHG DW PP UHY

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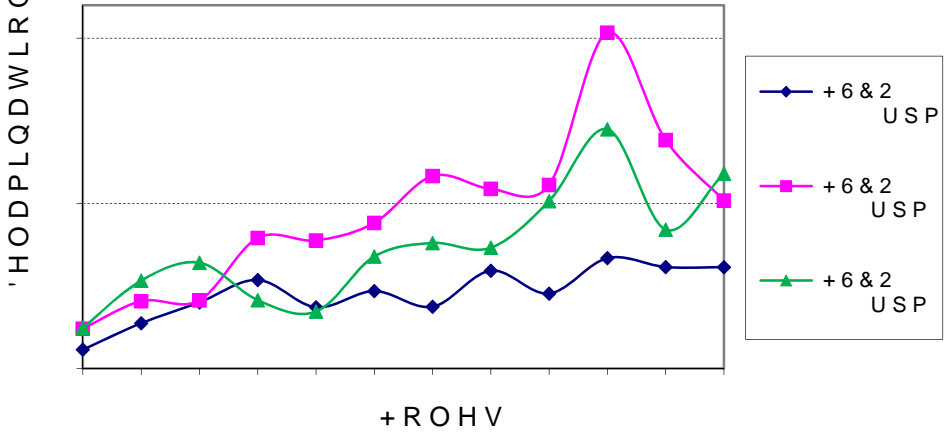


Fig. 4. 'HODPLQDWERQVLRQV KROHV

7KH GLIIHUHQW TXDOLWLHV REWDLQHG IURWKKHIFDQDZ  
 VHH ILJXUHV DQG FRUUVSRQGDQG WR WKH IODVW  
 ,W FDQ EH VHHQ KRZ WKH ZHDU RWDLQLQWRD GKDVOURIS  
 RQO\ KDYLQJ PDGH KROHV ZLWK WKDW WRRO

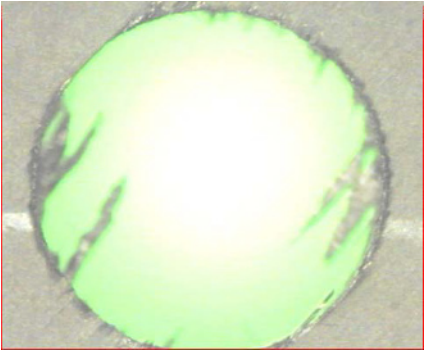


Fig. 5. )LUVW KROH LQ D VHULHV

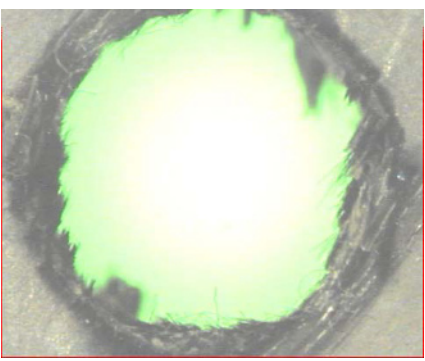


Fig. 6. /DVW KROH LQ D VHULHV

### 4 Conclusions

,I ZH IRFXVHG RQ WKH +6&2 GUKOO EFKW WIR FO ZOH UF  
 IRU USP ZHUH PXFK ORZHU WKDVQ ZMIQOV B VR VWB LQHOG  
 GDWD ZHUH DOVR ORZHU IRU WKH KLJKHU FXWWLQJ VSH  
 ,I ZH IRFXV RQ WKH FXWWLQJ VSHHGUVXP P WQZL W K  
 +6&2 GULOO SUREDEO\ GXH WR WHKH EPRW KLS UVR BRIOV %  
 IROORZHG D VLPLODU EHKDYLRU E SWRWK H6 S2HODPLQDW  
 VDPH FXWWLQJ FRQGLWLRQV ZHUHGJHQLH W D O O \ ORZHU V  
 :H FDQ VD\ WKDW WKH WRRO WLS DKLQJ JK B D WLRQ W  
 EHFDXVH XQGHU HT B D W D R Q G P W O R G H H G H M O D P L Q W W L R Q  
 7KH ORZHU GHODPLQDWLRQ REWDLQH V R D W K L J Q F X W D V  
 WHPSHUDWXUH LQ WKH SODWH Z R D F K L Z L X Q G Z C H Q X F H F U  
 LQWHUQDO GDPDJH H G F R X D G H G W K E W H Q K U F D Q J K R W W K R E V H H W  
 ,Q WKH +6&2 GULOO ELW DW WKH SOD VLW GUVLRQ W H S H  
 GHODPLQDWLRQ IDFWRU UHPDLQ Z H D D P R X W H F R G V D W W H  
 :KHQ ZH ZRUNHG ZLWKR O R Z Q G H M K V W D R R I O V G D G U E B O A E  
 KLJKHU YDOXHV RIDG R Q D Z K L Q D W L R R Z H U V H G H G O D S H E G W L R C  
 WKH WRRO ZHDU ZDV JUHDWHU  
 ,W LV ZRUWK QRWLQJ WKH H[FHVV D Q D H F D N B V V X R I H W H Z  
 SURILWDEOH WR PHFKDQL]H WKH V H Z P D Z H Q W D O R V E E W B L W  
 RI TXDOLW\  
 +H ZRXOG IDLO WR GR WKH H[SHULPHW S W Z L W H U H E W & Z  
 EH H[SHFWHG WR REWDLQ ORZHU GHODPLQDWLRQ IDFWRU

### References

0 6DQ -XDQ i 0DUWtQ DQG ) 6DQ SW RQR ,QW ± 0DF  
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 5HVH D B F K  
 1 )HLWR - /ySH] 3XHQWH & 6DQWL X W W O S F D Q G 0 + C  
 \$ )DUD] ' %LHUPDQQ DQG . :HLQH W W ,QW - 0DF  
 , 6 6K\KD ' . \$VSLQZDOO 6 / 6RRR R O % O D C O I H \ ,QW  
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