,QSXW	7HVW 3ODQ 3UHIL[		7HVW 3ODQ 0DWHULDO 7HVW				&XUH &\FOH &RQGLWLRQ					
	$,75		3:&	:7	/+	57'						

7HVW 3UR[RFHGXUH 3:& :7 /+ 57'

0DWHULDO 07 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH :DIHU 7HQVLOH &RQGLWLRQ 57'

7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KURG WR /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&URVV 6HFWLRQDO $UHD LQ²	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDVXUHG	3RLVVRQ V 5DWLR 0HDVXUHG	0RGXOXV NVL 0HDVXUHG	1RWHV
$,75 3:& :7 % /+ 57'					/$7	/*%			1RW 7HVWHG
$,75 3:& :7 % /+ 57'						/$7			1RW 7HVWHG
$,75 3:& :7 % /+ 57'					/$%	/*0			1RW 7HVWHG
$,75 3:& :7 % /+ 57'					/$7	/*%			1RW 7HVWHG
$,75 3:& :7 % /+ 57'						/*0			1RW 7HVWHG
$,75 3:& :7 % /+ 57'					/$7	/*%			1RW 7HVWHG
$,75 3:& :7 % /+ 57'					/*7	/*%			1RW 7HVWHG
$,75 3:& :7 % /+ 57'						/*0			1RW 7HVWHG
0LQLPXP									
0D[LPXP									
$YHUDJH									
6WDQGDUG 'HYLDWLRQ									
&RHIILFLHQW RI 9DULDWLRQ									
1R 6SHFLPHQV									

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& :7 /+ (7:

7HVW 3URX

,QSXW 7HVW 3ODQ 3UHI[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:&)7 /+ &7'
7HVW 3UR[7 3:&)7 /+ &7'
0DWHULDO 7HVW &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV $&* ,QF
7HVW 7\SH)LOO 7HQVLOH &RQGLWLRQ &7' 0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KRRG WR /DERUDWRU\ 5HSRUW
6SHFLPHQ ,' /HQJWK LQ :LGWK LQ 7KLFNQHVV LQ 0HDVXUHPHQW/RFDWLRQ 1RWH

$,75	3:&	)7	%	/+	&7'			/$7	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/*0	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/$7	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/$%	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/$7	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/$7	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'			/$7	1RWH 7HVWH
$,75	3:&	)7	%	/+	&7'	/*7	/$%	0	1RW 7HVWH

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:&)7 /+ 57'
7HVW 3UR[3:&)7 /+ 57'
0DWHULDO

7HVW 3ODQ 3UHI[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:&)7 /+ (7:
7HVW SURJ[3:&)7 /+ (7:
0DWHULDO
7HVW 7\SH)LOO 7HQVLOH &RQGLWLRQ 3OLHV $&* ,QF
0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KRG WR /DERUDWRU\ 5HSRUW
0HDVXUHPHQW

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:&)7 /+ (7:

7HVW 3URX $,75 3:&)7 /+ (7:

0DWHULDO 3OLHV $&* ,QF
7HVW 7\SH)LOO 7HQVLOH &RQGLWLRQ 0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KRUG WR /DEUDWRU\ 5HSRUW

						0HDV(XUHPHQW	0HDV(XUHPHQW
$,75	3:&	)7 %	/+	(7:	7 /$% /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	17	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH
$,75	3:&	)7 %	/+	(7:	% /$7 /*	*(	1RW 7HVWH

,QSXW	7HVW 3ODQ 3UHILA	7HVW 3ODQ 0DWHULDO 7HVW	&XUH &\FOH &RQGLWLRQ
	$,75	3:& :& /+ 57'	

7HVW 3UR7RFRO 3:& :& /+ 57'

0DWHULDO 07 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH :DUS &RPSUHVVLRQ 57'

7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KURG WR /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&URVV 6HFW $UHD LQ²	,QLWLDO 0RG OE	8OWLPDWH 6WUHQJWK 0HDVXUHG	1RUPDOL]HG	1RUPDOL]HG
$,75 3:& :& % /+ 57'						7*0		
$,75 3:& :& % /+ 57'					,%	+*0 +		
$,75 3:& :& % /+ 57'						7*0	*(	*(
$,75 3:& :& % /+ 57'						%*0		
$,75 3:& :& % /+ 57'						%*%		
$,75 3:& :& % /+ 57'						+*0		
$,75 3:& :& % /+ 57'						%*0		
$,75 3:& :& % /+ 57'					,%	%*0 +		*(
0LQLPXP								
0D[LPXP								
$YHUDJH								
6WDQGDUG 'HYLDWLRQ								
&RHIILFLHQW RI 9DULDWLRQ								
1R 6SHFLPHQV								

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

,QSXW	7HVW 3ODQ 3UHIL[		7HVW 3ODQ 0DWHULDO 7HVW				&XUH &\FOH &RQGLWLRQ					
	$,75		3:&	:&	/+	(7:						

7HVW 3UR,7 3:& :& /+ (7:

0DWHULDO 07 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH :DUS &RPSUHVVLRQ (7:

7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KURG WR /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\	7HVW 7HPS	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDVXUHG	8OWLPDWH 6WUHQJWK NVL 1RUPDOL]HG	0RGXOXV NVL 0HDVXUHG	0RGXOXV NVL 1RUPDOL]HG	3RLVVRQ V 5DWLR
$,75 3:& :& % /+ (7							+*7				
$,75 3:& :& % /+ (7							+*7				
$,75 3:& :& % /+ (7							%*0				
$,75 3:& :& % /+ (7							+*0				
$,75 3:& :& % /+ (7							%*%				
$,75 3:& :& % /+ (7							+*%				
$,75 3:& :& % /+ (7							+*%		*(		*(
$,75 3:& :& % /+ (7							%*0				*(
0LQLPXP											
0D[LPXP											
$YHUDJH											
6WDQGDUG 'HYLDWLRQ											
&RHIILFLHQW RI 9DULDWLRQ											
1R 6SHFLPHQV											

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& :& /+ (7:
7HVW SURJUDP 3:& :& /+ (7:
0DWHULDO ____ 3OLHV_ $&* ,QF
7HVW 7\SH :DUS &RPSUHVVLRQ 0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670'

,QSXW	7HVW 3ODQ 3UHILA	7HVW 3ODQ 0DWHULDO 7HVW	&XUH &\FOH &RQGLWLRQ
	$,75	3:&)& /+ 57'	

7HVW 3UR7RFRO 3:&)& /+ 57'

0DWHULDO 07 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7K3FNQHVV	$&* ,QF 0DWHULDO 3URFHVV /DERUDWRU\ 5HSRUW
7HVW 7\SH)LOP &RPSUHVVLRQ 57'	
7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KURG WR	

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV	8OWLPDWH)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDVXUHG 1RUPDOL]HG 3RVW 0
$,75 3:&)& % /+ 57'					%*7	
$,75 3:&)& % /+ 57'					+*0	
$,75 3:&)& % /+ 57'					+*7	
$,75 3:&)& % /+ 57'					%*0	
$,75 3:&)& % /+ 57'					%*%	
$,75 3:&)& % /+ 57'					%*0	*(*(
$,75 3:&)& % /+ 57'					%*0	
$,75 3:&)& % /+ 57'					%*0	
0LQLPXP						
0D[LPXP						
$YHUDJH						
6WDQGDUG 'HYLDWLRQ						
&RHIILFLHQW RI 9DULDWLRQ						
1R 6SHFLPHQV						

1RWHV
17 1RW 7HVWHG)& % /+ 57' 0RGXOXV IURP WR
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

7HVW 3UR[3:&)& /+ (7'
0DWHULDO

7HVW 3ODQ 3UHI[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:&)& /+ (7:
7HVW SURJ,75 3:&)& /+ (7:
0DWHULDO

,QSXW	7HVW 3ODQ 3UHILA	7HVW 3ODQ 0DWHULDO 7HVW	&XUH &\FOH &RQGLWLRQ									
	$,75		3:&	)&	/+	(7:						

7HVW 3UR,7 3:&)& /+ (7:

0DWHULDO 07 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7K3FNQHVV

7HVW 7\SH)LOP &RPSUHVVLRQ (7:

7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KURG WR

$&* ,QF

0DWHULDO 3URFHVV

/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\	7KLFNQHVV	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDVXUHG	3RLVVRQ V 5DWLR 0HDVXUHG	6WUHQJWK NVL 1RUPDOL]HG	3RLVVRQ V 5DWLR 1RUPDOL]HG
$,75 3:&)& % /+ (7:							+*%		*(	*(
$,75 3:&)& % /+ (7:							+*0		*(	*(
$,75 3:&)& % /+ (7:							+*7		*(	*(
$,75 3:&)& % /+ (7:							+*%		*(	*(
$,75 3:&)& % /+ (7:							%*0		*(	*(
$,75 3:&)& % /+ (7:							+*0		*(	*(
$,75 3:&)& % /+ (7:							+*0		*(	*(
$,75 3:&)& % /+ (7:							+*0		*(	*(
0LQLPXP										
0D[LPXP										
$YHUDJH										
6WDQGDUG 'HYLDWLRQ										
&RHIILFLHQW RI 9DULDWLRQ										
1R 6SHFLPHQV										

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
*(*DJH (UURU
)0)DLOXUH 0RGH 8QDFFHSWDEOH

,QSXW 7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& ,36 /+ 57'

7HVW 3URF * $,75 3:& ,36 /+ 57'

0DWHULDO 70 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV $&* ,QF

7HVW 7\SH " ƒ ,Q 3ODQH 6KHDU &RQGLWLRQ 573OLHV _ 0DWHULDO 3URFHVV

7HVW 0HWKRG 03 $670' 0RGXOXV 3RLVVRQ V 5DQJH &KRUG /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ ` 5:	2IIVH#	6WUDLQ	0D[LPXP	0RGXOXV 0VL 0HDVXUH
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17
$,75 3:& ,36 % /+ 57'					17

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
1$ 1RW $SSOLFDEOH
)0)DLOXUH 0RGH 8QDFFHSWDEOH
*(*DJH (UUR

,QSXW	7HVW 3ODQ 3UHILI[		7HVW 3ODQ		0DWHULDO 7HVW		&XUH &\FOH &RQGLWLRQ		
	$,75		3:&	,36	/+	(7:			

7HVW 3UR7HVW 3:& ,36 /+ (7:

0DWHULDO 7\SH 7HVW 0HWKRG	1RUPDO]DWLRQ &XUHG 3O\ 7KLFNQHVV 7HVW 7\SH " ƒ ,Q 3ODQH 6KHDU &RQGLWLRQ (73OLHV 03 $670' 0RGXOXV 3RLVVRQ V 5DWLR &KURG	$&* ,QF 0DWHULDO 3URFHVV /DERUDWRU\

6SHFLPHQ ,'	/HQJWK :LGWK	&XUHG 3O\ 7KLFNQHVV	6KHDU 6WUHQJWK 0RGXOXV 0VL 2IIVHW 6WUDLQ 0D[LPXP	0HDVXUH
$,75 3:& ,36 % /+ (7:			*(	17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
$,75 3:& ,36 % /+ (7:				17
0LQLPXP				
0D[LPXP				
$YHUDJH				
6WDQGDUG 'HYLDWLRQ				
&RHIILFLHQW RI 9DULDWLRQ				
1R 6SHFLPHQV				

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
1$ 1RW $SSOLFDEOH
)0)DLOXUH 0RGH 8QDFFHSWDEOH
*(*DJH (UUR

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& 6%6 /+ 57'

7HVW 3UR7RO 3:& 6%6 /+ 57'
0DWHULDO 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV &RQ
7HVW 7\SH 6KRUW %HDP 6KHD &RQGLWLRQ 57' 3OLHV
7HVW 0HWKRG 03 $670' 6SDQ W

0DWHULDO 3URFHVV
/DERUDWRU\ 5HSRUW

0HDVXUH 1RUPDOL]H
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6
$,75 3:& 6%6 % /+ 57' ,/6

,QSXW	7HVW 3ODQ 3UHILI[		7HVW 3ODQ 0DWHULDO		7HVW &XUH &\FOH &RQGLWLRQ			
	$,75		3:&	6%6	/+	(7:		

7HVW 3UR7RO 3:& 6%6 /+ (7:

0DWHULDO 0DWUL[&) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV &RQF

7HVW 7\SH 6KRUW %HDP 6KHDU &RQGLWLRQ (7 3OLHV

7HVW 0HWKRG 03 $670' 6SDQ W

0DWHULDO 3URFHVV /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK	:LGWK	7KLFNQHVV	&XUHG 3O\ 7KLFNQHVV	8OWLPDWH /RDG	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NV 0HDVXUH1RUPDOL]H
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						)&&
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						,/6
$,75 3:& 6%6 % /+	(7:						,/6
0LQLPXP							
0D[LPXP							
$YHUDJH							
6WDQGDUG 'HYLDWLRQ							
&RHIILFLHQW RI 9DULDWLRQ							
1R 6SHFLPHQV							

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
)0)DLOXUH 0RGH 8QDFFHSWDEOH

,QSXW 7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& 6%6 /+ (7:
7HVW 3UR7RO 3:& 6%6 /+ (7:
0DWHULDO &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV &RQ
7HVW 7\SH 6KRUW %HDP 6KHDU &RQGLWLRQ (7: 3OLHV
7HVW 0HWKRG 03 $670' 6SDQ W
0DWHULDO 3URFHVV
/DERUDWRU\ 5HSRUW
6SHFLPHQ ,' /HQJWK LQ 8OWLPDWH 6WUHQJWK N
)DLOXUH 0RGH 0HDVXUHG1RUPDOL]H
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7: ,/6
$,75 3:& 6%6 % /+ (7:)&&
$,75 3:& 6%6 % /+ (7: ,/6

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
)0)DLOXUH 0RGH 8QDFFHSWDEOH

7HVW 3ODQ 3UHI[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& 2+7 /+ 57'

7HVW *URXS $,75 3:& 2+7 /+ 57'

0DWHULDO 1RUPDOL]DWLRQ&XUHG 3O\ 7KLFNQHVV $&* ,QF
7HVW 7\SH 2SHQ +ROH 7HQVLRQ /D\X&RQGLWLRQ 57 3OLHV 0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670' /DERUDWRU\ 5HSRUW

0HDVXUHPHQW1RUPDOL]H

$,75 3:& 2+7 % /+ 57'

7HVW 3ODQ 3UHI[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& 2+7 /+ (7:

7HVW *URXS $,75 3:& 2+7 /+ (7:

0DWHULDO 1RUPDOL]DWLRQ&XUHG 3O\ 7KLFNQHVV $&* ,QF
7HVW 7\SH 2SHQ +ROH 7HQVLRQ /D\X&RQGLWLRQ (73OLHV 0DWHULDO 3URFHVV
7HVW 0HWKRG 03 $670' /DERUDWRU\ 5HSRUW

0HDVXUHPHQW1RUPDOL]H

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ
$,75 3:& 2+& /+ 57'

7HVW *URXS $,75 3:& 2+& /+ 57'

0DWHULDO 1RUPDOL]DWLRQ *URXS 3O\ 7KLFNQHVV $&* ,QF

7HVW 7\SH 2SHQ +ROH &RPSUHVVLRQ 'LVWULEXWLRQ 57' 0DWHULDO 3URFHVV

7HVW 0HWKRG 03 $670' /DERUDWRU\ 5HSRUW

+ROH (GJH
6LGH I (QG J

(01HDVXUHPHQW

$,75 3:& 2+& % /+ 57' 0 /*
$,75 3:& 2+& % /+ 57' 0 /*
$,75 3:& 2+& % /+ 57'

,QSXW	7HVW 3ODQ 3UHIL[		7HVW 3ODQ 0DWHULDO 7HVW					&XUH &\FOH &RQGLWLRQ			
	$,75		3:&	2+&	/+	(7:					

7HVW *URXS $,75 3:& 2+& /+ (7:

0DWHULDO 0DWUL[&) 5: 1RUPDOL]DWLRQ &RQGLWLRQV 3O\ 7KLFNQHVV

7HVW 7\SH 2SHQ +ROH &RPSUHVVLRQ &RQGLWLRQ (7OHV

7HVW 0HWKRG 03 $670'

$&* ,QF
0DWHULDO 3URFHVV
/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK	7KLFNQHVV	7KLFNQHVV	+ROH 6LGH	(GJH I	(GJH 2	:LGWK 7KLFNQHVV	8OWLPDWH 7HQVLOH 6WUHQJWK	6WUHVV DW (ORQJDWLRQ	)UDFWXUH 1HFN 5DGLXV	)UDFWXUH 7\SH
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
$,75 3:& 2+& % /+ (7:											0 /*
0LQLPXP											
0D[LPXP											
$YHUDJH											
6WDQGDUG 'HYLDWLRQ											
&RHIILFLHQW RI 9DULDWLRQ											
1R 6SHFLPHQV											

1RWHV
17 1RW 7HVWHG RU ([FOXGHG
15 1R 5HVXOW
1$ 1RW $SSOLFDEOH
)0)DLOXUH 0RGH 8QDFFHSWDEOH

)250 03 $670'

7HVW 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ

,QSXW	7HVW 3ODQ 3UHIL[		7HVW 3ODQ 0DWHULDO		7HVW &XUH &\FOH &RQGLWLRQ						
	$,75		3:&	,/7	/+	57'					

7HVW $UWLFOH 3:& ,/7 /+ 57'

0DWHULDO &) 5: 1RUPDOL]DWLRQ 16 3O\ 7KLFNQHVV 7HVW 7\SH ,QWHUODPLQDU 7HQVLOH 1RQ/LQHDU 537OLHV 7HVW 0HWKRG $670'	$&* ,QF 0DWHULDO 3URFHVV /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	$670 ' 6SHF 'LPHQVLRQV								8OWLPDWH SHDN				)DLOXUH
	7KLFN	,Q : LGWK LQ	LQHU	RXWHU	LQ $UHD	LQ	LQ	LQ	LQ3	OE &%6 OE	LQ1U	SVL	NVL 0RGH
$,75 3:& ,/7 % /+	57'												,7
$,75 3:& ,/7 % /+	57'												,7
$,75 3:& ,/7 % /+	57'												,7
$,75 3:& ,/7 % /+	57'												,7
$,75 3:& ,/7 % /+	57'												,7
$,75 3:& ,/7 % /+	57'												,7
0LQLPXP													
0D[LPXP													
$YHUDJH													
6WDQGDUG 'HYLDWLRQ													
&RHIILFLHQW RI 9DULDWLRQ													
1R 6SHFLPHQV													

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
1$ 1RW $SSOLFDEOH

,QSXW	7HVW 3ODQ 3UHIL[		7HVW 3ODQ 0DWHULDO			7HVW &XUH &\FOH &RQGLWLRQ					
	$,75		3:&	,/7	/+	(7:					

7HVW $,75 3:& ,/7 /+ (7:

0DWHULDO &) 5: 1RUPDOL]DWLRQ 3O\ 7KLFNQHVV 7HVW 7\SH ,QWHUODPLQDU 7HQVLOH 3URSHUWLHV (7OLHV 7HVW 0HWKRG $670'	$&* ,QF 0DWHULDO 3URFHVV /DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	$670 ' 6SHF 'LPHQVLRQV								8OWLPDWH SHDN				)DLOXUH
	7KLFN	,Q :	LGWK,QQ,LQ	$QJOH	LQ N GHJ û	LQ3 OE	&%6 LQ OE LQ	1U SVL U NVL	0RGH				
$,75 3:& ,/7 % /+	(7:												,7
$,75 3:& ,/7 % /+	(7:												,7
$,75 3:& ,/7 % /+	(7:												,7
$,75 3:& ,/7 % /+	(7:												,7
$,75 3:& ,/7 % /+	(7:												,7
$,75 3:& ,/7 % /+	(7:												,7
0LQLPXP													
0D[LPXP													
$YHUDJH													
6WDQGDUG 'HYLDWLRQ													
&RHIILFLHQW RI 9DULDWLRQ													
1R 6SHFLPHQV													

1RWHV
17 1RW 7HVWHG
15 1R 5HVXOW
1$ 1RW $SSOLFDEOH

												normalizing t_{ply} [in]	
Specimen Number	**ACG Code**	**ACG Batch #**	**ACG Cure Cycle**	**Prepreg Lot #**	**Cure Cycle Batch #**	**Measured Impact Energy (in-lbf)**	**Strength [ksi]**	**Avg. Specimen Thickn. [in]**	**# Plies in Laminate**	**Failure Mode**	**Avg. t_{ply} [in]**	**Strength$_{norm}$ [ksi]**
& . . % + $	3 : & & $, % / + 5 7 '	%	/ +							/ ' 0		
& . . % + $	3 : & & $, % / + 5 7 '	%	/ +							/ ' 0		
& . . % + $	3 : & & $, % / + 5 7 '	%	/ +							/ ' 0		
& . . % + $	3 : & & $, % / + 5 7 '	%	/ +							/ ' 0		
						Average	**31.709**				**Average$_{norm}$**	**32.322**
						Standard Dev.	**1.067**				**Standard Dev.$_{norm}$**	**1.038**
						Coeff. of Var. [%]	**3.365**				**Coeff. of Var. [%]$_{norm}$**	**3.213**
						Min.	**30.183**				**Min.**	**30.909**
						Max.	**32.672**				**Max.**	**33.344**
						Number of Spec.	**4**				**Number of Spec.**	**4**
Specimen Number	**ACG Code**	**ACG Batch #**	**ACG Cure Cycle**	**Prepreg Lot #**	**Cure Cycle Batch #**	**Measured Impact Energy (in-lbf)**	**Strength [ksi]**	**Avg. Specimen Thickn. [in]**	**# Plies in Laminate**	**Failure Mode**	**Avg. t_{ply} [in]**	**Strength$_{norm}$ [ksi]**

$ Y H U D J H $p À $ Y H U D J H