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

7HVW 3URS $,75 3:& :7 /+ 57'

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

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

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

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

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 8OW /RDG	8OWLPDWH 7KLFN	)DLOXUH 0RGH	8OWLPDWH 0HDV(1RUPDOL]HG)	6WUHQJWK NVL 0HDV(1RUPDOL]HG)	3RLVVRQ V 5DWLR	0RGXOXV 0
$,75 3:& :7 % /+ 57'						/$7	/*%			1RW 7HVWH
$,75 3:& :7 % /+ 57'							/$7			1RW 7HVWH
$,75 3:& :7 % /+ 57'						/$%	/*0			1RW 7HVWH
$,75 3:& :7 % /+ 57'						/$7	/*%			1RW 7HVWH
$,75 3:& :7 % /+ 57'							/*0			1RW 7HVWH
$,75 3:& :7 % /+ 57'						/$7	/*%			1RW 7HVWH
$,75 3:& :7 % /+ 57'						/*7	/*%			1RW 7HVWH
$,75 3:& :7 % /+ 57'							/*0			1RW 7HVWH
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 3UHIL[$,75 | 7HVW 3ODQ 3:& | 0DWHULDO)7 /+ | 7HVW &7' | &XUH &\FOH &RQGLWLRQ

7HVW 3URWRFRO $,75 3:&)7 /+ &7'

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV $&* ,QF

7HVW 7\SH)LOO 7HQVLOH &RQGLWLRQ &7' 0DWHULDO 3URFHVV

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

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	0HDV(XURUPDOL]H	0HDV(XURUPDOL]H	1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$7		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/*0		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$7		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$%		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$7		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$7		1RW 7HVWH
$,75 3:&)7 % /+ &7'				/$7		1RW 7HVWH
$,75 3:&)7 % /+ &7'			/*7 /$%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 3URX $,75 3:&)7 /+ 57'
0DWHULDO

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

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

7HVW 3UR $,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 /DERUDWRU\ 5HSRUW

0HDV 1RUPDOL]H

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

7HVW 3URXS $,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 /DERUDWRU\ 5HSRUW

			0HDV(XUH	1RUPDO	1RUPDOL]H
$,75	3:&)7 % /+ (7:		7 /$% /*	*(	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 3UHIL[		7HVW 3ODQ	0DWHULDO 7HVW			&XUH &\FOH &RQGLWLRQ				
	$,75		3:&	:&	/+	57'					

7HVW 3URS $,75 3:& :& /+ 57'

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH :DUS &RPSUHVVLRQ (&RQGLWLRQ 57'

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

$&* ,QF

0DWHULDO 3URFHVV

/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV	8OWLPDWH /RDG OE	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDVXUHG	1RUPDOL]HG	0RGXOXV 0HDVXUHG	1RUPDOL]HG	3RLVVRQ V 5DWLR
$,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 3URJUDP $,75 3:& :& /+ (7:

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

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

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

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

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV	8OWLPDWH /RDG OE	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDV	1RUPDOL]HG	0RGXOXV 0VL 0HDV	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 3URFHGXUH $,75 3:& :& /+ (7:

0DWHULDO 3OLHV $&* ,QF

7HVW 7\SH :DUS (&RPSUHVVLRQ &RQGLWLRQ 0DWHULDO 3URFHVV

7HVW 0HWKRG 03 $670'

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

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

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH)LOO &RPSUHVVLRQ &RQGLWLRQ 57'

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

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

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV	8OWLPDWH /RDG OE	)DLOXUH 0RGH		8OWLPDWH 6WUHQJWK NVL 0HDVXUHG	1RUPDOL]HG	0RGXOXV 0VL 0HDVXUHG	1RUPDOL]HG 3RLVVRQ V 5DWLR
$,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 3ODQ 3UHIL[7HVW 3ODQ 0DWHULDO 7HVW &XUH &\FOH &RQGLWLRQ

$,75 3:&)& /+ (7'

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

0DWHULDO

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

7HVW SUR[$,75 3:&)& /+ (7:
0DWHULDO

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

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

0DWHULDO 0700 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH)LOO &RPSUHVVLRQ &RQGLWLRQ (7:

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

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

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 8OW /RDG	7KLFNQHVV	)DLOXUH 0RGH	8OWLPDWH 6WUHQJWK NVL 0HDV	1RUPDOL]HG	0HDV	1RUPDOL]HG	3RLVVRQ V 5DWLR
$,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 3URWR $,75 3:& ,36 /+ 57'

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV $&* ,QF

7HVW 7\SH " ƒ ,Q 3ODQH 6KHDU &RQGLWLRQ 57 3OLHV _ 0DWHULDO 3URFHVV

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

6SHFLPHQ ,' /HQJWK LQ ` 5: 2IIVHW 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 (UURU

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

7HVW 3URWR $,75 3:& ,36 /+ (7:

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV

7HVW 7\SH " ƒ ,Q 3ODQH 6KHDU &RQGLWLRQ (73OLHV _

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

$&* ,QF

0DWHULDO 3URFHVV

/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK	:LGWK	LQ	7KLFNQHVV	&XUHG 3O\ 7KLFNQHVV	)DLOXUH 0RGH	6KHDU 6WUHQJWK 2IIVHW	6WUDLQ	0RGXOXV 0D[LPXP 0VL 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 (UURU

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

7HVW 3URWR $,75 3:& 6%6 /+ (7:

0DWHULDO 070 &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV $&* ,QF

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

7HVW 0HWKRG 03 $670' 6SDQ W

0DWHULDO 3URFHVV

/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV LQ	8OWLPDWH /RDG OEV	8OWLPDWH 6WUHQJWK NVL	)DLOXUH 0RGH	0HDV &XUH 1RUPDOL]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 3URFHVV $,75 3:& 6%6 /+ (7:

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

7HVW 7\SH 6KRUW %HDP 6KHDU &RQGLWLRQ (7: 3OLHV 0DWHULDO 3URFHVV

7HVW 0HWKRG 03 $670' 6SDQ W /DERUDWRU\ 5HSRUW

8OWLPDWH 6WUHQJWK NVL

6SHFLPHQ ,'	/HQJWK LQ	)DLOXUH 0RGH 0HDV&XUH1RUPDOL]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	0707 &) 5:	1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV	$&* ,QF
7HVW 7\SH	2SHQ +ROH &RPSUHVVLRQ	&RQGLWLRQ (7: 3OLHV	0DWHULDO 3URFHVV
7HVW 0HWKRG	03 $670'		/DERUDWRU\ 5HSRUW

6SHFLPHQ ,'	/HQJWK LQ	:LGWK LQ	7KLFNQHVV LQ	&XUHG 3O\ 7KLFNQHVV	'LDPHWHU	+ROH 6LGH	(GJH I	(GJH (QG'LD	'LDPHWHU 7KLFNQHVV	8OWLPDWH OE	8OWLPDWH 6WUHQJWK (	1HDU)DLOXUH	)DLOXUH 0RGH
$,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

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 *URS $,75 3:& ,/7 /+ 57'

0DWHULDO &) 5: 1RUPDOL]DWLRQ &XUHG 3O\ 7KLFNQHVV
7HVW 7\SH ,QWHUODPLQDU 7HQVLRQ 0RGXOXV 537 5372OLHV
7HVW 0HWKR $670'

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

6SHFLPHQ ,'	$670 ' 6SHF 'LPHQVLRQV									8OWLPDWH SHDN			)DLOXUH
	7KLFN	,Q	:LGWK LQQHU	,Q RXWHU	$QJOH	LQ	N GHJ	û	LQ 8 OE	&%6 OE LQ	LQ 1U SVL	U 1 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 $UHD *UR $,75 3:& ,/7 /+ (7:

0DWHULDO 0/DO &) 5: 1RUPDOL]DWLRQ &XUH 3O\ 7KLFNQHVV

7HVW 7\SH ,QWHUODPLQDU 7HQVLRQ &RQGLWLRQ (7 /OHV_

7HVW 0HWKR $670'

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

6SHFLPHQ ,'	$670 ' 6SHF 'LPHQVLRQV							8OWLPDWH SHDN					)DLOXUH
	7KLFN	,Q	:LGWK	LQQHU	RXWHU	$QJOH	LQ N GHJ	û LQ8 OE	&%6 OE LQ	1U	SVL	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