



R0.02 ~ 0.5 R1 ~ 1.5 R2 ~ 3 421P

• 고경도강(HRc50~62), 프리하드강 계열의 고속 가공 엔드밀

- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 고정밀 공차 적용으로 초정밀 가공에 적합합니다.
- 코너R 형상을 날부치핑이 적도록 설계하였습니다.
- 다양한 코너R과 유효장으로 맞춤 가공이 가능합니다.
- 초미립자 초경합금(0.2 μ m)을 채택, 고속절삭시 뛰어난 성능을 발휘합니다.

• Endmills for pre-hardened and hardened steel(HRc50~62)

- Good wear resistance by Si-based PVD coating.
- High precise edge tolerance.
- Designed for minimizing edge chipping by corner R shape.
- Various corner R and flute length for wide range application.
- Outstanding performance at high speed machining by ultra fine (0.2 μ m) WC grade.

D Size	D Tolerance
Ø 0.8 ~ 5	+0 ~ -0.01mm
Ø 6 ~ 12	-0.005 ~ -0.015mm

단위 : mm

Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Shank Dia d	비고
4CRE 008 0002 020	0.8 X R0.02	0.8	2	45	4	
4CRE 008 0002 040	0.8 X R0.02	0.8	4	45	4	
4CRE 008 0002 060	0.8 X R0.02	0.8	6	45	4	
4CRE 008 0002 080	0.8 X R0.02	0.8	8	45	4	
4CRE 008 0002 100	0.8 X R0.02	0.8	10	45	4	
4CRE 008 0002 120	0.8 X R0.02	0.8	12	50	4	
4CRE 008 0005 020	0.8 X R0.05	0.8	2	45	4	
4CRE 008 0005 040	0.8 X R0.05	0.8	4	45	4	
4CRE 008 0005 060	0.8 X R0.05	0.8	6	45	4	
4CRE 008 0005 080	0.8 X R0.05	0.8	8	45	4	
4CRE 008 0005 100	0.8 X R0.05	0.8	10	45	4	
4CRE 008 0005 120	0.8 X R0.05	0.8	12	50	4	
4CRE 008 001 020	0.8 X R0.1	0.8	2	45	4	
4CRE 008 001 040	0.8 X R0.1	0.8	4	45	4	
4CRE 008 001 060	0.8 X R0.1	0.8	6	45	4	
4CRE 008 001 080	0.8 X R0.1	0.8	8	45	4	
4CRE 008 001 100	0.8 X R0.1	0.8	10	45	4	
4CRE 008 001 120	0.8 X R0.1	0.8	12	50	4	
4CRE 010 0002 040	1 X R0.02	1	4	45	4	
4CRE 010 0002 060	1 X R0.02	1	6	45	4	
4CRE 010 0002 080	1 X R0.02	1	8	45	4	
4CRE 010 0002 100	1 X R0.02	1	10	50	4	
4CRE 010 0002 120	1 X R0.02	1	12	50	4	
4CRE 010 0002 140	1 X R0.02	1	14	50	4	
4CRE 010 0002 160	1 X R0.02	1	16	50	4	
4CRE 010 0002 200	1 X R0.02	1	20	50	4	
4CRE 010 0002 250	1 X R0.02	1	25	60	4	
4CRE 010 0002 300	1 X R0.02	1	30	70	4	
4CRE 010 0005 040	1 X R0.05	1	4	45	4	
4CRE 010 0005 060	1 X R0.05	1	6	45	4	
4CRE 010 0005 080	1 X R0.05	1	8	45	4	
4CRE 010 0005 100	1 X R0.05	1	10	50	4	
4CRE 010 0005 120	1 X R0.05	1	12	50	4	
4CRE 010 0005 140	1 X R0.05	1	14	50	4	
4CRE 010 0005 160	1 X R0.05	1	16	50	4	
4CRE 010 0005 200	1 X R0.05	1	20	50	4	
4CRE 010 0005 250	1 X R0.05	1	25	60	4	
4CRE 010 0005 300	1 X R0.05	1	30	70	4	
4CRE 010 001 040	1 X R0.1	1	4	45	4	
4CRE 010 001 060	1 X R0.1	1	6	45	4	
4CRE 010 001 080	1 X R0.1	1	8	45	4	
4CRE 010 001 100	1 X R0.1	1	10	50	4	
4CRE 010 001 120	1 X R0.1	1	12	50	4	
4CRE 010 001 140	1 X R0.1	1	14	50	4	
4CRE 010 001 160	1 X R0.1	1	16	50	4	
4CRE 010 001 200	1 X R0.1	1	20	50	4	
4CRE 010 001 250	1 X R0.1	1	25	60	4	
4CRE 010 001 300	1 X R0.1	1	30	70	4	
4CRE 010 002 040	1 X R0.2	1	4	45	4	
4CRE 010 002 060	1 X R0.2	1	6	45	4	
4CRE 010 002 080	1 X R0.2	1	8	45	4	
4CRE 010 002 100	1 X R0.2	1	10	50	4	
4CRE 010 002 120	1 X R0.2	1	12	50	4	
4CRE 010 002 140	1 X R0.2	1	14	50	4	
4CRE 010 002 160	1 X R0.2	1	16	50	4	
4CRE 010 002 200	1 X R0.2	1	20	50	4	
4CRE 010 002 080	1 X R0.2	1	8	45	4	
4CRE 010 002 100	1 X R0.2	1	10	50	4	
4CRE 010 002 120	1 X R0.2	1	12	50	4	
4CRE 010 002 140	1 X R0.2	1	14	50	4	
4CRE 010 002 160	1 X R0.2	1	16	50	4	
4CRE 010 002 200	1 X R0.2	1	20	50	4	

단위 : mm

HARD series

Order Number	날경 Diameter D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샹크 Shank Dia d	비고	Order Number	날경 Diameter D × R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샹크 Shank Dia d	비고
4CRE 012 003 040	1.2 X R0.3	1.2	4	45	4		4CRE 020 0002 100	2 X R0.02	2	10	50	4	
4CRE 012 003 060	1.2 X R0.3	1.2	6	45	4		4CRE 020 0002 120	2 X R0.02	2	12	50	4	
4CRE 012 003 080	1.2 X R0.3	1.2	8	45	4		4CRE 020 0002 140	2 X R0.02	2	14	50	4	
4CRE 012 003 100	1.2 X R0.3	1.2	10	50	4		4CRE 020 0002 160	2 X R0.02	2	16	50	4	
4CRE 012 003 120	1.2 X R0.3	1.2	12	50	4		4CRE 020 0002 180	2 X R0.02	2	18	50	4	
4CRE 012 003 140	1.2 X R0.3	1.2	14	50	4		4CRE 020 0002 200	2 X R0.02	2	20	50	4	
4CRE 012 003 160	1.2 X R0.3	1.2	16	50	4		4CRE 020 0002 220	2 X R0.02	2	22	60	4	
4CRE 012 003 200	1.2 X R0.3	1.2	20	50	4		4CRE 020 0002 250	2 X R0.02	2	25	60	4	
4CRE 015 0002 060	1.5 X R0.02	1.5	6	45	4		4CRE 020 0002 300	2 X R0.02	2	30	70	4	
4CRE 015 0002 080	1.5 X R0.02	1.5	8	45	4		4CRE 020 0002 350	2 X R0.02	2	35	70	4	
4CRE 015 0002 100	1.5 X R0.02	1.5	10	50	4		4CRE 020 0005 060	2 X R0.05	2	6	45	4	
4CRE 015 0002 120	1.5 X R0.02	1.5	12	50	4		4CRE 020 0005 080	2 X R0.05	2	8	45	4	
4CRE 015 0002 140	1.5 X R0.02	1.5	14	50	4		4CRE 020 0005 100	2 X R0.05	2	10	50	4	
4CRE 015 0002 160	1.5 X R0.02	1.5	16	50	4		4CRE 020 0005 120	2 X R0.05	2	12	50	4	
4CRE 015 0002 200	1.5 X R0.02	1.5	20	50	4		4CRE 020 0005 140	2 X R0.05	2	14	50	4	
4CRE 015 0002 220	1.5 X R0.02	1.5	22	60	4		4CRE 020 0005 160	2 X R0.05	2	16	50	4	
4CRE 015 0002 250	1.5 X R0.02	1.5	25	60	4		4CRE 020 0005 180	2 X R0.05	2	18	50	4	
4CRE 015 0005 060	1.5 X R0.05	1.5	6	45	4		4CRE 020 0005 200	2 X R0.05	2	20	50	4	
4CRE 015 0005 080	1.5 X R0.05	1.5	8	45	4		4CRE 020 0005 220	2 X R0.05	2	22	60	4	
4CRE 015 0005 100	1.5 X R0.05	1.5	10	50	4		4CRE 020 0005 250	2 X R0.05	2	25	60	4	
4CRE 015 0005 120	1.5 X R0.05	1.5	12	50	4		4CRE 020 0005 300	2 X R0.05	2	30	70	4	
4CRE 015 0005 140	1.5 X R0.05	1.5	14	50	4		4CRE 020 0005 350	2 X R0.05	2	35	70	4	
4CRE 015 0005 160	1.5 X R0.05	1.5	16	50	4		4CRE 020 001 060	2 X R0.1	2	6	45	4	
4CRE 015 0005 200	1.5 X R0.05	1.5	20	50	4		4CRE 020 001 080	2 X R0.1	2	8	45	4	
4CRE 015 0005 220	1.5 X R0.05	1.5	22	60	4		4CRE 020 001 100	2 X R0.1	2	10	50	4	
4CRE 015 0005 250	1.5 X R0.05	1.5	25	60	4		4CRE 020 001 120	2 X R0.1	2	12	50	4	
4CRE 015 001 060	1.5 X R0.1	1.5	6	45	4		4CRE 020 001 140	2 X R0.1	2	14	50	4	
4CRE 015 001 080	1.5 X R0.1	1.5	8	45	4		4CRE 020 001 160	2 X R0.1	2	16	50	4	
4CRE 015 001 100	1.5 X R0.1	1.5	10	50	4		4CRE 020 001 180	2 X R0.1	2	18	50	4	
4CRE 015 001 120	1.5 X R0.1	1.5	12	50	4		4CRE 020 001 200	2 X R0.1	2	20	50	4	
4CRE 015 001 140	1.5 X R0.1	1.5	14	50	4		4CRE 020 001 220	2 X R0.1	2	22	60	4	
4CRE 015 001 160	1.5 X R0.1	1.5	16	50	4		4CRE 020 001 250	2 X R0.1	2	25	60	4	
4CRE 015 001 200	1.5 X R0.1	1.5	20	50	4		4CRE 020 001 300	2 X R0.1	2	30	70	4	
4CRE 015 001 220	1.5 X R0.1	1.5	22	60	4		4CRE 020 001 350	2 X R0.1	2	35	70	4	
4CRE 015 001 250	1.5 X R0.1	1.5	25	60	4		4CRE 020 002 060	2 X R0.2	2	6	45	4	
4CRE 015 002 060	1.5 X R0.2	1.5	6	45	4		4CRE 020 002 080	2 X R0.2	2	8	45	4	
4CRE 015 002 080	1.5 X R0.2	1.5	8	45	4		4CRE 020 002 100	2 X R0.2	2	10	50	4	
4CRE 015 002 100	1.5 X R0.2	1.5	10	50	4		4CRE 020 002 120	2 X R0.2	2	12	50	4	
4CRE 015 002 120	1.5 X R0.2	1.5	12	50	4		4CRE 020 002 140	2 X R0.2	2	14	50	4	
4CRE 015 002 140	1.5 X R0.2	1.5	14	50	4		4CRE 020 002 160	2 X R0.2	2	16	50	4	
4CRE 015 002 160	1.5 X R0.2	1.5	16	50	4		4CRE 020 002 180	2 X R0.2	2	18	50	4	
4CRE 015 002 200	1.5 X R0.2	1.5	20	50	4		4CRE 020 002 200	2 X R0.2	2	20	50	4	
4CRE 015 002 220	1.5 X R0.2	1.5	22	60	4		4CRE 020 002 220	2 X R0.2	2	22	60	4	
4CRE 015 002 250	1.5 X R0.2	1.5	25	60	4		4CRE 020 002 250	2 X R0.2	2	25	60	4	
4CRE 015 003 060	1.5 X R0.3	1.5	6	45	4		4CRE 020 002 300	2 X R0.2	2	30	70	4	
4CRE 015 003 080	1.5 X R0.3	1.5	8	45	4		4CRE 020 002 350	2 X R0.2	2	35	70	4	
4CRE 015 003 100	1.5 X R0.3	1.5	10	50	4		4CRE 020 003 060	2 X R0.3	2	6	45	4	
4CRE 015 003 120	1.5 X R0.3	1.5	12	50	4		4CRE 020 003 080	2 X R0.3	2	8	45	4	
4CRE 015 003 140	1.5 X R0.3	1.5	14	50	4		4CRE 020 003 100	2 X R0.3	2	10	50	4	
4CRE 015 003 160	1.5 X R0.3	1.5	16	50	4		4CRE 020 003 120	2 X R0.3	2	12	50	4	
4CRE 015 003 200	1.5 X R0.3	1.5	20	50	4		4CRE 020 003 140	2 X R0.3	2	14	50	4	
4CRE 015 003 220	1.5 X R0.3	1.5	22	60	4		4CRE 020 003 160	2 X R0.3	2	16	50	4	
4CRE 015 003 250	1.5 X R0.3	1.5	25	60	4		4CRE 020 003 180	2 X R0.3	2	18	50	4	
4CRE 015 005 060	1.5 X R0.5	1.5	6	45	4		4CRE 020 003 200	2 X R0.3	2	20	50	4	
4CRE 015 005 080	1.5 X R0.5	1.5	8	45	4		4CRE 020 003 220	2 X R0.3	2	22	60	4	
4CRE 015 005 100	1.5 X R0.5	1.5	10	50	4		4CRE 020 003 250	2 X R0.3	2	25	60	4	
4CRE 015 005 120	1.5 X R0.5	1.5	12	50	4		4CRE 020 003 300	2 X R0.3	2	30	70	4	
4CRE 015 005 140	1.5 X R0.5	1.5	14	50	4		4CRE 020 003 350	2 X R0.3	2	35	70	4	
4CRE 015 005 160	1.5 X R0.5	1.5	16	50	4		4CRE 020 005 060	2 X R0.5	2	6	45	4	
4CRE 015 005 200	1.5 X R0.5	1.5	20	50	4		4CRE 020 005 080	2 X R0.5	2	8	45	4	
4CRE 015 005 220	1.5 X R0.5	1.5	22	60	4		4CRE 020 005 100	2 X R0.5	2	10	50	4	
4CRE 015 005 250	1.5 X R0.5	1.5	25	60	4		4CRE 020 005 120	2 X R0.5	2	12	50	4	
4CRE 020 0002 060	2 X R0.02	2	6	45	4		4CRE 020 005 140	2 X R0.5	2	14	50	4	
4CRE 020 0002 080	2 X R0.02	2	8	45	4		4CRE 020 005 160	2 X R0.5	2	16	50	4	

단위 : mm

Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샹크 Dia d	비고	Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샹크 Dia d	비고
4CRE 020 005 180	2 X R0.5	2	18	50	4		4CRE 030 005 400	3 X R0.5	3	40	80	6	
4CRE 020 005 200	2 X R0.5	2	20	50	4		4CRE 030 005 500	3 X R0.5	3	50	100	6	
4CRE 020 005 220	2 X R0.5	2	22	60	4		4CRE 030 005 600	3 X R0.5	3	60	110	6	
4CRE 020 005 250	2 X R0.5	2	25	60	4		4CRE 030 010 100	3 X R1	3	10	50	6	
4CRE 020 005 300	2 X R0.5	2	30	70	4		4CRE 030 010 120	3 X R1	3	12	50	6	
4CRE 020 005 350	2 X R0.5	2	35	70	4		4CRE 030 010 160	3 X R1	3	16	55	6	
4CRE 025 001 100	2.5 X R0.1	2.5	10	50	4		4CRE 030 010 200	3 X R1	3	20	60	6	
4CRE 025 001 120	2.5 X R0.1	2.5	12	50	4		4CRE 030 010 250	3 X R1	3	25	65	6	
4CRE 025 001 160	2.5 X R0.1	2.5	16	50	4		4CRE 030 010 300	3 X R1	3	30	70	6	
4CRE 025 001 200	2.5 X R0.1	2.5	20	50	4		4CRE 030 010 350	3 X R1	3	35	75	6	
4CRE 025 001 250	2.5 X R0.1	2.5	25	60	4		4CRE 030 010 400	3 X R1	3	40	80	6	
4CRE 025 001 300	2.5 X R0.1	2.5	30	70	4		4CRE 030 010 500	3 X R1	3	50	100	6	
4CRE 025 002 100	2.5 X R0.2	2.5	10	50	4		4CRE 030 010 600	3 X R1	3	60	110	6	
4CRE 025 002 120	2.5 X R0.2	2.5	12	50	4		4CRE 040 001 050	4 X R0.1	4	12	50	6	
4CRE 025 002 160	2.5 X R0.2	2.5	16	50	4		4CRE 040 001 070	4 X R0.1	4	20	70	6	
4CRE 025 002 200	2.5 X R0.2	2.5	20	50	4		4CRE 040 001 130	4 X R0.1	4	13	55	6	
4CRE 025 002 250	2.5 X R0.2	2.5	25	60	4		4CRE 040 001 160	4 X R0.1	4	16	55	6	
4CRE 025 002 300	2.5 X R0.2	2.5	30	70	4		4CRE 040 001 200	4 X R0.1	4	20	60	6	
4CRE 025 003 100	2.5 X R0.3	2.5	10	50	4		4CRE 040 001 250	4 X R0.1	4	25	65	6	
4CRE 025 003 120	2.5 X R0.3	2.5	12	50	4		4CRE 040 001 300	4 X R0.1	4	30	70	6	
4CRE 025 003 160	2.5 X R0.3	2.5	16	50	4		4CRE 040 001 350	4 X R0.1	4	35	75	6	
4CRE 025 003 200	2.5 X R0.3	2.5	20	50	4		4CRE 040 001 400	4 X R0.1	4	40	80	6	
4CRE 025 003 250	2.5 X R0.3	2.5	25	60	4		4CRE 040 001 450	4 X R0.1	4	45	90	6	
4CRE 025 003 300	2.5 X R0.3	2.5	30	70	4		4CRE 040 001 500	4 X R0.1	4	50	100	6	
4CRE 025 005 100	2.5 X R0.5	2.5	10	50	4		4CRE 040 001 600	4 X R0.1	4	60	110	6	
4CRE 025 005 120	2.5 X R0.5	2.5	12	50	4		4CRE 040 002 050	4 X R0.2	4	12	50	4	
4CRE 025 005 160	2.5 X R0.5	2.5	16	50	4		4CRE 040 002 070	4 X R0.2	4	20	70	4	
4CRE 025 005 200	2.5 X R0.5	2.5	20	50	4		4CRE 040 002 130	4 X R0.2	4	13	55	6	
4CRE 025 005 250	2.5 X R0.5	2.5	25	60	4		4CRE 040 002 160	4 X R0.2	4	16	55	6	
4CRE 025 005 300	2.5 X R0.5	2.5	30	70	4		4CRE 040 002 200	4 X R0.2	4	20	60	6	
4CRE 030 001 100	3 X R0.1	3	10	50	6		4CRE 040 002 250	4 X R0.2	4	25	65	6	
4CRE 030 001 120	3 X R0.1	3	12	50	6		4CRE 040 002 300	4 X R0.2	4	30	70	6	
4CRE 030 001 160	3 X R0.1	3	16	55	6		4CRE 040 002 350	4 X R0.2	4	35	75	6	
4CRE 030 001 200	3 X R0.1	3	20	60	6		4CRE 040 002 400	4 X R0.2	4	40	80	6	
4CRE 030 001 250	3 X R0.1	3	25	65	6		4CRE 040 002 450	4 X R0.2	4	45	90	6	
4CRE 030 001 300	3 X R0.1	3	30	70	6		4CRE 040 002 500	4 X R0.2	4	50	100	6	
4CRE 030 001 350	3 X R0.1	3	35	75	6		4CRE 040 002 600	4 X R0.2	4	60	110	6	
4CRE 030 001 400	3 X R0.1	3	40	80	6		4CRE 040 003 050	4 X R0.3	4	12	50	4	
4CRE 030 001 500	3 X R0.1	3	50	100	6		4CRE 040 003 070	4 X R0.3	4	20	70	4	
4CRE 030 002 100	3 X R0.2	3	10	50	6		4CRE 040 003 130	4 X R0.3	4	13	55	6	
4CRE 030 002 120	3 X R0.2	3	12	50	6		4CRE 040 003 160	4 X R0.3	4	16	55	6	
4CRE 030 002 160	3 X R0.2	3	16	55	6		4CRE 040 003 200	4 X R0.3	4	20	60	6	
4CRE 030 002 200	3 X R0.2	3	20	60	6		4CRE 040 003 250	4 X R0.3	4	25	65	6	
4CRE 030 002 250	3 X R0.2	3	25	65	6		4CRE 040 003 300	4 X R0.3	4	30	70	6	
4CRE 030 002 300	3 X R0.2	3	30	70	6		4CRE 040 003 350	4 X R0.3	4	35	75	6	
4CRE 030 002 350	3 X R0.2	3	35	75	6		4CRE 040 003 400	4 X R0.3	4	40	80	6	
4CRE 030 002 400	3 X R0.2	3	40	80	6		4CRE 040 003 450	4 X R0.3	4	45	90	6	
4CRE 030 002 500	3 X R0.2	3	50	100	6		4CRE 040 003 500	4 X R0.3	4	50	100	6	
4CRE 030 003 100	3 X R0.3	3	10	50	6		4CRE 040 003 600	4 X R0.3	4	60	110	6	
4CRE 030 003 120	3 X R0.3	3	12	50	6		4CRE 040 005 050	4 X R0.5	4	12	50	4	
4CRE 030 003 160	3 X R0.3	3	16	55	6		4CRE 040 005 070	4 X R0.5	4	20	70	4	
4CRE 030 003 200	3 X R0.3	3	20	60	6		4CRE 040 005 130	4 X R0.5	4	13	55	6	
4CRE 030 003 250	3 X R0.3	3	25	65	6		4CRE 040 005 160	4 X R0.5	4	16	55	6	
4CRE 030 003 300	3 X R0.3	3	30	70	6		4CRE 040 005 200	4 X R0.5	4	20	60	6	
4CRE 030 003 350	3 X R0.3	3	35	75	6		4CRE 040 005 250	4 X R0.5	4	25	65	6	
4CRE 030 003 400	3 X R0.3	3	40	80	6		4CRE 040 005 300	4 X R0.5	4	30	70	6	
4CRE 030 003 500	3 X R0.3	3	50	100	6		4CRE 040 005 350	4 X R0.5	4	35	75	6	
4CRE 030 005 100	3 X R0.5	3	10	50	6		4CRE 040 005 400	4 X R0.5	4	40	80	6	
4CRE 030 005 120	3 X R0.5	3	12	50	6		4CRE 040 005 450	4 X R0.5	4	45	90	6	
4CRE 030 005 160	3 X R0.5	3	16	55	6		4CRE 040 005 500	4 X R0.5	4	50	100	6	
4CRE 030 005 200	3 X R0.5	3	20	60	6		4CRE 040 005 600	4 X R0.5	4	60	110	6	
4CRE 030 005 250	3 X R0.5	3	25	65	6		4CRE 040 010 050	4 X R1	4	12	50	4	
4CRE 030 005 300	3 X R0.5	3	30	70	6		4CRE 040 010 070	4 X R1	4	20	70	4	
4CRE 030 005 350	3 X R0.5	3	35	75	6		4CRE 040 010 130	4 X R1	4	13	55	6	

단위 : mm

HARD series

Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Dia d	비고	Order Number	날경 Diameter D×R	날장 Length of cut L1	유효장 Effective Length L2	전장 Overall Length L	샙크 Dia d	비고
4CRE 040 010 160	4 X R1	4	16	55	6		4CRE 080 020 220	8 X R2	9	22	65	8	
4CRE 040 010 200	4 X R1	4	20	60	6		4CRE 080 020 400	8 X R2	9	40	100	8	
4CRE 040 010 250	4 X R1	4	25	65	6		4CRE 100 002 240	10 X R0.2	11	24	70	10	
4CRE 040 010 300	4 X R1	4	30	70	6		4CRE 100 002 400	10 X R0.2	11	40	100	10	
4CRE 040 010 350	4 X R1	4	35	75	6		4CRE 100 003 240	10 X R0.3	11	24	70	10	
4CRE 040 010 400	4 X R1	4	40	80	6		4CRE 100 003 400	10 X R0.3	11	40	100	10	
4CRE 040 010 450	4 X R1	4	45	90	6		4CRE 100 005 240	10 X R0.5	11	24	70	10	
4CRE 040 010 500	4 X R1	4	50	100	6		4CRE 100 005 400	10 X R0.5	11	40	100	10	
4CRE 040 010 600	4 X R1	4	60	110	6		4CRE 100 005 600	10 X R0.5	11	60	120	10	
4CRE 050 001 160	5 X R0.1	5	16	60	6		4CRE 100 010 240	10 X R1	11	24	70	10	
4CRE 050 001 300	5 X R0.1	5	30	70	6		4CRE 100 010 400	10 X R1	11	40	100	10	
4CRE 050 001 400	5 X R0.1	5	40	80	6		4CRE 100 010 600	10 X R1	11	60	120	10	
4CRE 050 001 500	5 X R0.1	5	50	100	6		4CRE 100 015 240	10 X R1.5	11	24	70	10	
4CRE 050 002 160	5 X R0.2	5	16	60	6		4CRE 100 015 400	10 X R1.5	11	40	100	10	
4CRE 050 002 300	5 X R0.2	5	30	70	6		4CRE 100 020 240	10 X R2	11	24	70	10	
4CRE 050 002 400	5 X R0.2	5	40	80	6		4CRE 100 020 400	10 X R2	11	40	100	10	
4CRE 050 002 500	5 X R0.2	5	50	100	6		4CRE 100 025 240	10 X R2.5	11	24	70	10	
4CRE 050 003 160	5 X R0.3	5	16	60	6		4CRE 120 003 260	12 X R0.3	13	26	80	12	
4CRE 050 003 300	5 X R0.3	5	30	70	6		4CRE 120 005 260	12 X R0.5	13	26	80	12	
4CRE 050 003 400	5 X R0.3	5	40	80	6		4CRE 120 005 400	12 X R0.5	13	40	110	12	
4CRE 050 003 500	5 X R0.3	5	50	100	6		4CRE 120 005 600	12 X R0.5	13	60	130	12	
4CRE 050 005 160	5 X R0.5	5	16	60	6		4CRE 120 010 260	12 X R1	13	26	80	12	
4CRE 050 005 300	5 X R0.5	5	30	70	6		4CRE 120 010 400	12 X R1	13	40	110	12	
4CRE 050 005 400	5 X R0.5	5	40	80	6		4CRE 120 010 600	12 X R1	13	60	130	12	
4CRE 050 005 500	5 X R0.5	5	50	100	6		4CRE 120 015 260	12 X R1.5	13	26	80	12	
4CRE 050 005 600	5 X R0.5	5	60	110	6		4CRE 120 015 400	12 X R1.5	13	40	110	12	
4CRE 050 010 160	5 X R1	5	16	60	6		4CRE 120 020 260	12 X R2	13	26	80	12	
4CRE 050 010 300	5 X R1	5	30	70	6		4CRE 120 020 400	12 X R2	13	40	110	12	
4CRE 050 010 400	5 X R1	5	40	80	6		4CRE 120 030 260	12 X R3	13	26	80	12	
4CRE 050 010 500	5 X R1	5	50	100	6								
4CRE 050 010 600	5 X R1	5	60	110	6								
4CRE 060 001 200	6 X R0.1	7	20	60	6								
4CRE 060 001 400	6 X R0.1	7	40	80	6								
4CRE 060 001 500	6 X R0.1	7	50	100	6								
4CRE 060 002 200	6 X R0.2	7	20	60	6								
4CRE 060 002 400	6 X R0.2	7	40	80	6								
4CRE 060 002 500	6 X R0.2	7	50	100	6								
4CRE 060 002 600	6 X R0.2	7	60	110	6								
4CRE 060 003 200	6 X R0.3	7	20	60	6								
4CRE 060 003 400	6 X R0.3	7	40	80	6								
4CRE 060 003 500	6 X R0.3	7	50	100	6								
4CRE 060 005 200	6 X R0.5	7	20	60	6								
4CRE 060 005 400	6 X R0.5	7	40	80	6								
4CRE 060 005 500	6 X R0.5	7	50	100	6								
4CRE 060 005 600	6 X R0.5	7	60	110	6								
4CRE 060 010 200	6 X R1	7	20	60	6								
4CRE 060 010 400	6 X R1	7	40	80	6								
4CRE 060 010 500	6 X R1	7	50	100	6								
4CRE 060 010 600	6 X R1	7	60	110	6								
4CRE 060 015 200	6 X R1.5	7	20	60	6								
4CRE 060 015 400	6 X R1.5	7	40	80	6								
4CRE 060 015 500	6 X R1.5	7	50	100	6								
4CRE 080 002 220	8 X R0.2	9	22	65	8								
4CRE 080 002 400	8 X R0.2	9	40	100	8								
4CRE 080 003 220	8 X R0.3	9	22	65	8								
4CRE 080 003 400	8 X R0.3	9	40	100	8								
4CRE 080 005 220	8 X R0.5	9	22	65	8								
4CRE 080 005 400	8 X R0.5	9	40	100	8								
4CRE 080 005 600	8 X R0.5	9	60	120	8								
4CRE 080 010 220	8 X R1	9	22	65	8								
4CRE 080 010 400	8 X R1	9	40	100	8								
4CRE 080 010 600	8 X R1	9	60	120	8								
4CRE 080 015 220	8 X R1.5	9	22	65	8								
4CRE 080 015 400	8 X R1.5	9	40	100	8								