

Laue class $O_h - m\bar{3}m$

6. SCANNING TABLES

Cubic

 No. 226 $Fm\bar{3}c$

$$\mathcal{G} = F_n^4 \bar{3}_c^2$$

 O_h^6

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit $s\mathbf{d}$	Sectional layer group	
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}			$\mathcal{L}(s\mathbf{d})$	
(001)	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	\mathbf{c}	$I4/mcm$ $(\mathbf{a}'/2 \text{ or } \mathbf{b}'/2)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$p4/mbm$ ($\mathbf{a}'/2$ or $\mathbf{b}'/2$)	L633
(100)	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$	\mathbf{a}		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p4/nbm$ ($\mathbf{a}'/2$ or $\mathbf{b}'/2$)	L62
(010)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$	\mathbf{b}		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$p4bm$ ($\mathbf{a}'/2$ or $\mathbf{b}'/2$)	L56
(110)	\mathbf{c}	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	$Imcb$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pmaa$	L38
($\bar{1}\bar{1}0$)	\mathbf{c}	$(\mathbf{a} + \mathbf{b})/2$	$(\mathbf{b} - \mathbf{a})/2$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pmab$ [$(\mathbf{a}' + \mathbf{b}')/4$]	L45
(011)	\mathbf{a}	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pma2$ ($\mathbf{a}'/4$)	L24
(01 $\bar{1}$)	\mathbf{a}	$(\mathbf{b} + \mathbf{c})/2$	$(\mathbf{c} - \mathbf{b})/2$				
(101)	\mathbf{b}	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$				
($\bar{1}01$)	\mathbf{b}	$(\mathbf{c} + \mathbf{a})/2$	$(\mathbf{a} - \mathbf{c})/2$				
(111)	$(\mathbf{a} - \mathbf{c})/2$	$(\mathbf{b} - \mathbf{a})/2$	$\boldsymbol{\tau}$	$R\bar{3}c$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d};$	$p\bar{3}$	L66
($\bar{1}\bar{1}1$)	$(-\mathbf{a} - \mathbf{c})/2$	$(\mathbf{a} - \mathbf{b})/2$	$\boldsymbol{\tau}_3$		$\frac{1}{3}\mathbf{d}, \frac{5}{6}\mathbf{d};$	$p\bar{3} [(2\mathbf{a}' + \mathbf{b}')/3]$	L66
($1\bar{1}\bar{1}$)	$(\mathbf{a} + \mathbf{c})/2$	$(-\mathbf{a} - \mathbf{b})/2$	$\boldsymbol{\tau}_1$		$\frac{2}{3}\mathbf{d}, \frac{1}{6}\mathbf{d}]$	$p\bar{3} [(\mathbf{a}' + 2\mathbf{b}')/3]$	L66
($\bar{1}\bar{1}\bar{1}$)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{a} + \mathbf{b})/2$	$\boldsymbol{\tau}_2$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d};$	$p321$	L68
					$\frac{1}{12}\mathbf{d}, \frac{7}{12}\mathbf{d};$	$p321 [(2\mathbf{a}' + \mathbf{b}')/3]$	L68
				$\frac{5}{12}\mathbf{d}, \frac{11}{12}\mathbf{d}]$	$p321 [(\mathbf{a}' + 2\mathbf{b}')/3]$	L68	
				$[\pm s\mathbf{d}, (\pm s + \frac{1}{6})\mathbf{d},$			
				$(\pm s + \frac{1}{3})\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d},$			
				$(\pm s + \frac{2}{3})\mathbf{d}, (\pm s + \frac{5}{6})\mathbf{d}]$	$p3$	L65	

 No. 227 $Fd\bar{3}m$

$$\mathcal{G} = F_d^4 \bar{3}_m^2 \text{ origin } 1$$

 O_h^7

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit $s\mathbf{d}$	Sectional layer group	
	\mathbf{a}'	\mathbf{b}'	\mathbf{d}			$\mathcal{L}(s\mathbf{d})$	
(001)	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	\mathbf{c}	$I4_1/amd$ (origin 1)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d};$	$p\bar{4}m2$	L59
(100)	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$	\mathbf{a}		$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$p\bar{4}m2$ ($\mathbf{a}'/2$ or $\mathbf{b}'/2$)	L59
(010)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$	\mathbf{b}		$[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d};$	$pmmb$ ($\mathbf{b}'/4$)	L41
				$\frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$	$pmma$ ($\mathbf{a}'/4$)	L41	
				$[\pm s\mathbf{d}, (\pm s + \frac{1}{4})\mathbf{d},$			
				$(\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}]$	$pmm2$	L23	
(110)	\mathbf{c}	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	$Ibmm$ $(\mathbf{a}'/8 + \mathbf{d}/4)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pbmm$ ($3\mathbf{a}'/8 + \mathbf{b}'/4$)	L40
(011)	\mathbf{a}	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pbmn$ ($\mathbf{a}'/8$)	L42
(101)	\mathbf{b}	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pbm2$ ($3\mathbf{a}'/8 + \mathbf{b}'/4$)	L24
($\bar{1}\bar{1}0$)	\mathbf{c}	$(\mathbf{a} + \mathbf{b})/2$	$(\mathbf{b} - \mathbf{a})/2$	$Ibmm$ $(3\mathbf{a}'/8 + \mathbf{d}/4)$	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	$pbmm$ ($\mathbf{a}'/8 + \mathbf{b}'/4$)	L40
(01 $\bar{1}$)	\mathbf{a}	$(\mathbf{b} + \mathbf{c})/2$	$(\mathbf{c} - \mathbf{b})/2$		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$pbmn$ ($3\mathbf{a}'/8$)	L42
($\bar{1}01$)	\mathbf{b}	$(\mathbf{c} + \mathbf{a})/2$	$(\mathbf{a} - \mathbf{c})/2$		$[\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}]$	$pbm2$ ($\mathbf{a}'/8 + \mathbf{b}'/4$)	L24
(111)	$(\mathbf{a} - \mathbf{c})/2$	$(\mathbf{b} - \mathbf{a})/2$	$\boldsymbol{\tau}$	$R\bar{3}m$ $(\mathbf{d}/8)$	$[\frac{1}{8}\mathbf{d}, \frac{7}{8}\mathbf{d},$	$p\bar{3}m1$	L72
($\bar{1}\bar{1}1$)	$(-\mathbf{a} - \mathbf{c})/2$	$(\mathbf{a} - \mathbf{b})/2$	$\boldsymbol{\tau}_3$		$\frac{11}{24}\mathbf{d}, \parallel \frac{23}{24}\mathbf{d},$	$p\bar{3}m1 [(2\mathbf{a}' + \mathbf{b}')/3]$	L72
($1\bar{1}\bar{1}$)	$(\mathbf{a} + \mathbf{c})/2$	$(-\mathbf{a} - \mathbf{b})/2$	$\boldsymbol{\tau}_1$		$\frac{19}{24}\mathbf{d}] \parallel \frac{7}{24}\mathbf{d}]$	$p\bar{3}m1 [(\mathbf{a}' + 2\mathbf{b}')/3]$	L72
($\bar{1}\bar{1}\bar{1}$)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{a} + \mathbf{b})/2$	$\boldsymbol{\tau}_2$		$[(\pm s + \frac{1}{8})\mathbf{d}, (\pm s + \frac{11}{24})\mathbf{d},$	$p3m1$	L69
				$(\pm s + \frac{19}{24})\mathbf{d}]$			

No. 227 $Fd\bar{3}m$

$$\mathcal{G} = F \frac{4}{d} \bar{3} \frac{2}{m} \text{ origin } 2$$

 O_h^7

Orientation orbit (<i>hkl</i>)	Conventional basis of the scanning group			Scanning group \mathcal{H}	Linear orbit <i>sd</i>	Sectional layer group $\mathcal{L}(sd)$	
	a'	b'	d				
(001)	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	c	$I4_1/amd$ (origin 2) ($\mathbf{a}'/2$ or $\mathbf{b}'/2$)	[$0\mathbf{d}, \frac{1}{2}\mathbf{d};$ $\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d};$ $\frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}$] [$\pm s\mathbf{d}, (\pm s + \frac{1}{4})\mathbf{d},$ $(\pm s + \frac{1}{2})\mathbf{d}, (\pm s + \frac{3}{4})\mathbf{d}$]	<i>pmmb</i>	L41
(100)	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$	a			<i>pmma</i> [$(\mathbf{a}' + \mathbf{b}')/4$]	L41
(010)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$	b			<i>p4m2</i> ($\mathbf{b}'/4$)	L59
						<i>p4m2</i> ($\mathbf{b}'/4$)	L59
						<i>pmm2</i> ($\mathbf{b}'/4$)	L23
(110)	c	$(\mathbf{a} - \mathbf{b})/2$	$(\mathbf{a} + \mathbf{b})/2$	<i>Ibmm</i>	[$0\mathbf{d}, \frac{1}{2}\mathbf{d}$] [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}$]	<i>pbmm</i>	L42
(011)	a	$(\mathbf{b} - \mathbf{c})/2$	$(\mathbf{b} + \mathbf{c})/2$			<i>pbmm</i> [$(\mathbf{a}' + \mathbf{b}')/4$]	L40
(101)	b	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{c} + \mathbf{a})/2$			<i>pbm2</i> [$(\mathbf{a}' + \mathbf{b}')/4$]	L24
(110)	c	$(\mathbf{a} + \mathbf{b})/2$	$(\mathbf{b} - \mathbf{a})/2$	<i>Ibmm</i> [$(\mathbf{a}' + \mathbf{b}' + \mathbf{d})/4$]	[$0\mathbf{d}, \frac{1}{2}\mathbf{d}$] [$\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}$] [$\pm s\mathbf{d}, (\pm s + \frac{1}{2})\mathbf{d}$]	<i>pbmm</i>	L40
(011)	a	$(\mathbf{b} + \mathbf{c})/2$	$(\mathbf{c} - \mathbf{b})/2$			<i>pbmm</i> [$(\mathbf{a}' + \mathbf{b}')/4$]	L42
(101)	b	$(\mathbf{c} + \mathbf{a})/2$	$(\mathbf{a} - \mathbf{c})/2$			<i>pbm2</i>	L24
(111)	$(\mathbf{a} - \mathbf{c})/2$	$(\mathbf{b} - \mathbf{a})/2$	τ	With respect to origin at <i>P</i>			
(111)	$(-\mathbf{a} - \mathbf{c})/2$	$(\mathbf{a} - \mathbf{b})/2$	τ_3	With respect to origin at <i>P</i> + $(\mathbf{a} + \mathbf{b})/4$			
(111)	$(\mathbf{a} + \mathbf{c})/2$	$(-\mathbf{a} - \mathbf{b})/2$	τ_1	With respect to origin at <i>P</i> + $(\mathbf{b} + \mathbf{c})/4$			
(111)	$(\mathbf{c} - \mathbf{a})/2$	$(\mathbf{a} + \mathbf{b})/2$	τ_2	With respect to origin at <i>P</i> + $(\mathbf{c} + \mathbf{a})/4$			
				$R\bar{3}m$	[$0\mathbf{d}, \frac{1}{2}\mathbf{d},$ $\frac{1}{3}\mathbf{d}, \parallel \frac{2}{6}\mathbf{d},$ $\frac{2}{3}\mathbf{d}, \frac{1}{6}\mathbf{d}$] [$\pm s\mathbf{d}, (\pm s + \frac{1}{3})\mathbf{d},$ $(\pm s + \frac{2}{3})\mathbf{d}$]	<i>p3m1</i>	L72
						<i>p3m1</i> [$(2\mathbf{a}' + \mathbf{b}')/3$]	L72
						<i>p3m1</i> [$(\mathbf{a}' + 2\mathbf{b}')/3$]	L72
						<i>p3m1</i>	L69

Centring type F

Orientation orbit (hkl)	Conventional basis of the scanning group			Auxiliary basis of the scanning group		
	a'	b'	d	\hat{a}	\hat{b}	\hat{c}
($hk0$)	c	$n\hat{a} - m\hat{b}$	$p\hat{a} + q\hat{b}$	$(a - b)/2$	$(a + b)/2$	c
($\bar{h}k0$)	c	$n\hat{a} + m\hat{b}$	$-p\hat{a} + q\hat{b}$			
($k\bar{h}0$)	c	$m\hat{a} + n\hat{b}$	$q\hat{a} + p\hat{b}$			
($\bar{k}\bar{h}0$)	c	$m\hat{a} - n\hat{b}$	$-q\hat{a} + p\hat{b}$			
($0hk$)	a	$n\hat{a} - m\hat{b}$	$p\hat{a} + q\hat{b}$	$(b - c)/2$	$(b + c)/2$	a
($0\bar{h}k$)	a	$n\hat{a} + m\hat{b}$	$-p\hat{a} + q\hat{b}$			
($0k\bar{h}$)	a	$m\hat{a} - n\hat{b}$	$q\hat{a} + p\hat{b}$			
($0\bar{k}\bar{h}$)	a	$m\hat{a} + n\hat{b}$	$-q\hat{a} + p\hat{b}$			
($k0\bar{h}$)	b	$n\hat{a} - m\hat{b}$	$p\hat{a} + q\hat{b}$	$(c - a)/2$	$(c + a)/2$	b
($k0\bar{h}$)	b	$n\hat{a} + m\hat{b}$	$-p\hat{a} + q\hat{b}$			
($h0k$)	b	$m\hat{a} - n\hat{b}$	$q\hat{a} + p\hat{b}$			
($h0\bar{k}$)	b	$m\hat{a} + n\hat{b}$	$-q\hat{a} + p\hat{b}$			
h even, k odd or h odd, k even $\Rightarrow n = h + k, m = h - k$						
h, k odd $\Rightarrow n = (h + k)/2, m = (h - k)/2$						
(hhl)	$(a - b)/2$	$n\hat{a} - m\hat{c}$	$p\hat{a} + q\hat{c}$	$(a + b)/2$	c	$(a - b)/2$
($\bar{h}hl$)	$(a - b)/2$	$n\hat{a} + m\hat{c}$	$-p\hat{a} + q\hat{c}$			
($h\bar{h}l$)	$(a + b)/2$	$n\hat{a} - m\hat{c}$	$p\hat{a} + q\hat{c}$	$(b - a)/2$	c	$(a + b)/2$
($\bar{h}\bar{h}l$)	$(a + b)/2$	$n\hat{a} + m\hat{c}$	$-p\hat{a} + q\hat{c}$			
(lhh)	$(b - c)/2$	$n\hat{a} - m\hat{a}$	$p\hat{a} + q\hat{a}$	$(b + c)/2$	a	$(b - c)/2$
($\bar{l}h\bar{h}$)	$(b - c)/2$	$n\hat{a} + m\hat{a}$	$-p\hat{a} + q\hat{a}$			
($l\bar{h}\bar{h}$)	$(b + c)/2$	$n\hat{a} - m\hat{a}$	$p\hat{a} + q\hat{a}$	$(c - b)/2$	a	$(b + c)/2$
($\bar{l}h\bar{h}$)	$(b + c)/2$	$n\hat{a} + m\hat{a}$	$-p\hat{a} + q\hat{a}$			
($h\bar{l}h$)	$(c - a)/2$	$n\hat{a} - m\hat{b}$	$p\hat{a} + q\hat{b}$	$(c + a)/2$	b	$(c - a)/2$
($\bar{h}l\bar{h}$)	$(c - a)/2$	$n\hat{a} + m\hat{b}$	$-p\hat{a} + q\hat{b}$			
($h\bar{l}h$)	$(c + a)/2$	$n\hat{a} - m\hat{b}$	$p\hat{a} + q\hat{b}$	$(a - c)/2$	b	$(c + a)/2$
($h\bar{l}\bar{h}$)	$(c + a)/2$	$n\hat{a} + m\hat{b}$	$-p\hat{a} + q\hat{b}$			
h odd $\Rightarrow m = h, n = 2l$; h even $\Rightarrow m = h/2, n = l$						

Arithmetic class $m\bar{3}mF$

Serial No. Group type Group	225 O_h^5 $Fm\bar{3}m$	226 O_h^6 $Fm\bar{3}c$	227 O_h^7 $Fd\bar{3}m$		228 O_h^8 $Fd\bar{3}c$	
			Origin 1	Origin 2	Origin 1	Origin 2
$(hk0)$ $(\bar{h}k0)$ $(kh0)$ $(\bar{k}h0)$ $(0hk)$ $(0\bar{h}k)$ $(0kh)$ $(0\bar{k}h)$ $(k0h)$ $(k0\bar{h})$ $(h0k)$ $(h0\bar{k})$	$I112/m$	$I112/m$	$I112/b$ $(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/b$	$I112/b$ $3(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/b$
(hhl) $(\bar{h}hl)$ $(h\bar{h}l)$ $(\bar{h}\bar{h}l)$ (lhh) $(l\bar{h}\bar{h})$ $(l\bar{h}\bar{h})$ $(\bar{l}hh)$ $(\bar{l}h\bar{h})$ $(\bar{l}h\bar{h})$ (hlh) $(\bar{h}l\bar{h})$ $(\bar{h}l\bar{h})$ $(hl\bar{h})$	$I112/m$	$I112/a$	$I112/m$ $(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/m$	$I112/a$ $3(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/a$
			$I112/m$ $(\mathbf{a} + 3\mathbf{b} + 3\mathbf{c})/8$ or $(3\mathbf{a} + \mathbf{b} + 3\mathbf{c})/8$	$I112/m$ $(\mathbf{a} + \mathbf{c})/4$ or $(\mathbf{b} + \mathbf{c})/4$	$I112/a$ $(\mathbf{a} + 3\mathbf{b} + \mathbf{c})/8$ or $(3\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/a$ $(\mathbf{a} + \mathbf{c})/4$ or $(\mathbf{b} + \mathbf{c})/4$
			$I112/m$ $(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/m$	$I112/a$ $3(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/a$
			$I112/m$ $(3\mathbf{a} + \mathbf{b} + 3\mathbf{c})/8$ or $(3\mathbf{a} + 3\mathbf{b} + \mathbf{c})/8$	$I112/m$ $(\mathbf{b} + \mathbf{a})/4$ or $(\mathbf{c} + \mathbf{a})/4$	$I112/a$ $(\mathbf{a} + \mathbf{b} + 3\mathbf{c})/8$ or $(\mathbf{a} + 3\mathbf{b} + \mathbf{c})/8$	$I112/a$ $(\mathbf{b} + \mathbf{a})/4$ or $(\mathbf{c} + \mathbf{a})/4$
			$I112/m$ $(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/m$	$I112/a$ $3(\mathbf{a} + \mathbf{b} + \mathbf{c})/8$	$I112/a$
			$I112/m$ $(3\mathbf{a} + 3\mathbf{b} + \mathbf{c})/8$ or $(\mathbf{a} + 3\mathbf{b} + 3\mathbf{c})/8$	$I112/m$ $(\mathbf{c} + \mathbf{b})/4$ or $(\mathbf{a} + \mathbf{b})/4$	$I112/a$ $(3\mathbf{a} + \mathbf{b} + \mathbf{c})/8$ or $(\mathbf{a} + \mathbf{b} + 3\mathbf{c})/8$	$I112/a$ $(\mathbf{c} + \mathbf{b})/4$ or $(\mathbf{a} + \mathbf{b})/4$