No. 70 *Fddd* D_{2h}^{24}

$\mathcal{G} = F\frac{2}{d}\frac{2}{d}\frac{2}{d}$ origin 1

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	**a**	**b**	**c**	*Fddd* ($\boldsymbol{\tau}/8$)	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}; \frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	*c*222 *c*222 $[(\mathbf{a}'+\mathbf{b}')/4]$	 L22
(100)	**b**	**c**	**a**		$[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d}; \frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$	$\widehat{p}112/b$ $[(\mathbf{a}'+\mathbf{b}')/8]$ $\widehat{p}112/a$ $[(3\mathbf{a}'+\mathbf{b}')/8$ or $(\mathbf{a}'+3\mathbf{b}')/8]$	 L07 L07
(010)	**c**	**a**	**b**		$[\pm s\mathbf{d}, (\pm s+\frac{1}{4})\mathbf{d}; (\pm s+\frac{1}{2})\mathbf{d}, (\pm s+\frac{3}{4})\mathbf{d}]$	$\widehat{p}112$	L03

$\boldsymbol{\tau} = \mathbf{a}' + \mathbf{b}' + \mathbf{d}$.

No. 70 *Fddd* D_{2h}^{24}

$\mathcal{G} = F\frac{2}{d}\frac{2}{d}\frac{2}{d}$ origin 2

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	**a**	**b**	**c**	*Fddd*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}; \frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	$\widehat{p}112/b$ $\widehat{p}112/a$ ($\mathbf{a}'/4$ or $\mathbf{b}'/4$)	L07 L07
(100)	**b**	**c**	**a**		$[\frac{1}{8}\mathbf{d}, \frac{5}{8}\mathbf{d}; \frac{3}{8}\mathbf{d}, \frac{7}{8}\mathbf{d}]$	*c*222 $[(\mathbf{a}'+\mathbf{b}')/8]$ *c*222 $[3(\mathbf{a}'+\mathbf{b}')/8]$	 L22 L22
(010)	**c**	**a**	**b**		$[\pm s\mathbf{d}, (\pm s+\frac{1}{4})\mathbf{d}; (\pm s+\frac{1}{2})\mathbf{d}, (\pm s+\frac{3}{4})\mathbf{d}]$	$\widehat{p}112$ $[(\mathbf{a}'+\mathbf{b}')/8]$	 L03

No. 71 *Immm* D_{2h}^{25}

$\mathcal{G} = I\frac{2}{m}\frac{2}{m}\frac{2}{m}$

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Scanning group $\mathcal{H}$	Linear orbit $s\mathbf{d}$	Sectional layer group $\mathcal{L}(s\mathbf{d})$	
(001)	**a**	**b**	**c**	*Immm*	$[0\mathbf{d}, \frac{1}{2}\mathbf{d}]$	*pmmm*	L37
(100)	**b**	**c**	**a**		$[\frac{1}{4}\mathbf{d}, \frac{3}{4}\mathbf{d}]$	*pmmn* $[(\mathbf{a}'+\mathbf{b}')/4]$	L46
(010)	**c**	**a**	**b**		$[\pm s\mathbf{d}, (\pm s+\frac{1}{2})\mathbf{d}]$	*pmm*2	L23

Centring type *F*

Orientation orbit (hkl)	Conventional basis of the scanning group $\mathbf{a}'$	$\mathbf{b}'$	$\mathbf{d}$	Auxiliary basis of the scanning group $\widehat{\mathbf{a}}$	$\widehat{\mathbf{b}}$	$\widehat{\mathbf{c}}$
$(hk0)$	$\mathbf{c}$	$n\widehat{\mathbf{a}}-m\widehat{\mathbf{b}}$	$p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$	$(\mathbf{a}-\mathbf{b})/2$	$(\mathbf{a}+\mathbf{b})/2$	$\mathbf{c}$
$(\bar{h}k0)$	$\mathbf{c}$	$n\widehat{\mathbf{a}}+m\widehat{\mathbf{b}}$	$-p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$			
$(0hk)$	$\mathbf{a}$	$n\widehat{\mathbf{a}}-m\widehat{\mathbf{b}}$	$p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$	$(\mathbf{b}-\mathbf{c})/2$	$(\mathbf{b}+\mathbf{c})/2$	$\mathbf{a}$
$(0\bar{h}k)$	$\mathbf{a}$	$n\widehat{\mathbf{a}}+m\widehat{\mathbf{b}}$	$-p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$			
$(k0h)$	$\mathbf{b}$	$n\widehat{\mathbf{a}}-m\widehat{\mathbf{b}}$	$p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$	$(\mathbf{c}-\mathbf{a})/2$	$(\mathbf{c}+\mathbf{a})/2$	$\mathbf{b}$
$(k0\bar{h})$	$\mathbf{b}$	$n\widehat{\mathbf{a}}+m\widehat{\mathbf{b}}$	$-p\widehat{\mathbf{a}}+q\widehat{\mathbf{b}}$			

h even, k odd or h odd, k even $\Rightarrow n=h+k$, $m=h-k$
h, k odd $\Rightarrow n=(h+k)/2$, $m=(h-k)/2$

Arithmetic classes $222F$, $mm2F$ and $mmmF$

Serial No.	22	42	43	69	70	
Group type	D_2^7	C_{2v}^{18}	C_{2v}^{19}	D_{2h}^{23}	D_{2h}^{24}	
Group	$F222$	$Fmm2$	$Fdd2$	$Fmmm$	$Fddd$	
					Origin 1	Origin 2
$(hk0)$ $(\bar{h}k0)$	$I112$	$I112$	$I112$	$I112/m$	$I112/b$ $[(\mathbf{a}+\mathbf{b}+\mathbf{c})/8]$	$I112/b$
$(0hk)$ $(0\bar{h}k)$		$I11m$	$I11b$ $(\mathbf{a}/8)$			
$(k0h)$ $(k0\bar{h})$						