Table 1.2.13.1. *General reflection conditions due to glide planes and screw axes*

(*a*) Layer groups.
(1) Glide planes.

| Reflection condition | Orientation of plane | Glide vector | Symbol |
|---|---|---|---|
| $hk$: $h = 2n$ | (001) | **a**/2 | *a* |
| $hk$: $k = 2n$ | (001) | **b**/2 | *b* |
| $hk$: $h + k = 2n$ | (001) | **a**/2 + **b**/2 | *n* |
| $0k$: $k = 2n$ | (100) | **b**/2 | *b* |
| $h0$: $h = 2n$ | (010) | **a**/2 | *a* |

(2) Screw axes.

| Reflection condition | Direction of axis | Screw vector | Symbol |
|---|---|---|---|
| $h0$: $h = 2n$ | [100] | **a**/2 | $2_1$ |
| $0k$: $k = 2n$ | [010] | **b**/2 | $2_1$ |

(*b*) Rod groups.
(1) Glide planes.

| Reflection condition | Orientation of plane | Glide vector | Symbol |
|---|---|---|---|
| $l$: $l = 2n$ | Any orientation parallel to the *c* axis | **c**/2 | *c* |

(2) Screw axes.

| Reflection condition | Direction of axis | Screw vector | Symbol |
|---|---|---|---|
| $l$: $l = 2n$ | [001] | **c**/2 | $2_1$, $4_2$, $6_3$ |
| $l$: $l = 3n$ | [001] | **c**/3 | $3_1$, $3_2$, $6_2$, $6_4$ |
| $l$: $l = 4n$ | [001] | **c**/4 | $4_1$, $4_3$ |
| $l$: $l = 6n$ | [001] | **c**/6 | $6_1$, $6_5$ |

(*c*) Frieze groups, glide plane.

| Reflection condition | Orientation of plane | Glide vector | Symbol |
|---|---|---|---|
| $h$: $h = 2n$ | (10) | **a**/2 | *g* |

the site-symmetry group belongs to a lower crystal system. For example, for the 2*c* position of tetragonal layer group *p*4*mm* (L55), the site-symmetry group is the orthorhombic group '2*mm*.'. The two characters '*mm*' represent the secondary set of tetragonal symmetry directions, whereas the dot represents the tertiary tetragonal symmetry direction.

### 1.2.13. Reflection conditions

The *Reflection conditions* are listed in the right-hand column of each Wyckoff position. There are two types of reflection conditions:

(i) *General conditions*. These conditions apply to *all* Wyckoff positions of the subperiodic group.

(ii) *Special conditions* ('extra' conditions). These conditions apply only to *special* Wyckoff positions and must always be added to the general conditions of the subperiodic group.

The *general reflection conditions* are the result of three effects: centred lattices, glide planes and screw axes. For the nine layer groups with *centred* lattices, the corresponding general reflection condition is $h + k = 2n$. The general reflection conditions due to glide planes and screw axes for the subperiodic groups are given in Table 1.2.13.1.

*Example: The layer group p4bm (L56)*

General position 8*d*: $0k: k = 2n$ and $h0: h = 2n$ due respectively to the glide planes *b* and *a*. The projections along [100] and [010] of any crystal structure with this layer-group symmetry have, respectively, periodicity **b**/2 and **a**/2.

Special positions 2*a* and 2*b*: $hk: h + k = 2n$. Any set of equivalent atoms in either of these positions displays additional *c*-centring.

### 1.2.14. Symmetry of special projections

#### *1.2.14.1. Data listed in the subperiodic group tables*

Under the heading *Symmetry of special projections*, the following data are listed for three orthogonal projections of each layer group and rod group and two orthogonal projections of each frieze group:

(i) For layer and rod groups, each projection is made onto a plane normal to the projection direction. If there are three kinds of symmetry directions (*cf.* Table 1.2.4.1), the three projection directions correspond to the primary, secondary and tertiary symmetry directions. If there are fewer than three symmetry directions, the additional projection direction(s) are taken along coordinate axes.

For frieze groups, each projection is made on a line normal to the projection direction.

The directions for which data are listed are as follows:

(*a*) *Layer groups*:

| | |
|---|---|
| Triclinic/oblique<br>Monoclinic/oblique<br>Monoclinic/rectangular<br>Orthorhombic/rectangular | [001], [100], [010] |
| Tetragonal/square | [001], [100], [110] |
| Trigonal/hexagonal<br>Hexagonal/hexagonal | [001], [100], [210] |

(*b*) *Rod groups*:

| | |
|---|---|
| Triclinic<br>Monoclinic/inclined<br>Monoclinic/orthogonal<br>Orthorhombic | [001], [100], [010] |
| Tetragonal | [001], [100], [110] |
| Trigonal<br>Hexagonal | [001], [100], [210] |

(*c*) *Frieze groups*:

| | |
|---|---|
| Oblique<br>Rectangular | [10], [01] |

(ii) *The Hermann–Mauguin symbol*. For the [001] projection of a layer group, the Hermann–Mauguin symbol for the plane group resulting from the projection of the layer group is given. For the [001] projection of a rod group, the Hermann–Mauguin symbol for the resulting two-dimensional point group is given. For the remainder of the projections, in the case of both layer groups and