### Coordination

**Any preloading redefines melting time. While this phenomenon is especially pronounced in other makes of fuses having minimum melting currents appreciably less than 200% of rating, the effect of preloading must nonetheless be determined for the S&C refill units represented by these curves (see S&C Data Bulletin 240-195) and adjustments to these curves must be made:**

1. When close coordination is required.
2. When, regardless of the preciseness of coordination, the refill unit is subjected to temporary overloads.

**There are cases where the coordination requirements may be very exacting; for example, in coordinating a transformer-primary breaker with a service-entrance breaker. The time interval between the adjusted minimum melting curve and the total clearing curve greater than in the case of S&C speed options. Such other factors, including “time-lag” speeds, “super-slow” speeds, and “high-surge” speeds, require the use of “safety-zones” or setback allowances and, in addition, they have larger construction tolerances (plus 20% in current; plus 40% in terms of time). The application of these two factors will give a time interval between the adjusted minimum melting curve and the total clearing curve greater than in the case of S&C speed options.**

### SM Refill Units - S&C Slow Speed

**Since these refill units have silver element construction which is not subject to damage by aging or transient overcurrents, it is unnecessary to replace unblown refill units in single-phase or three-phase installations when one or more refill units have blown.**

Sometimes a selected ampere rating will fail to meet the coordination requirements in any available speed. In this case the selection of another rating for either the protecting or protected fuse usually will satisfy all requirements. Do not assume that other fuses that do not employ S&C’s silver, helically-coiled fusible element construction can better resolve a coordination impasse than the use of another ampere rating in one of the S&C speed options. Such other fuses, including “time-lag” speeds, “super-slow” speeds, and “high-surge” speeds, require the use of “safety-zones” or setback allowances and, in addition, they have larger construction tolerances (plus 20% in current; plus 40% in terms of time). The application of these two factors will give a time interval between the adjusted minimum melting curve and the total clearing curve greater than in the case of S&C speed options.

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**Basis**—These refill units are tested in accordance with the procedures described in ANSI Standard C37.41-1981, and they are rated to comply with ANSI Standard C37.46-1981. As required by these standards, the minimum melting current is not less than 200% of refill-unit ampere rating, and the minimum melting curves are based on tests starting with the refill unit at an ambient temperature of 20°C and no initial load.

**Construction**—Fusible elements are silver, helically coiled, end of soldiers’ construction.

**Tolerances**—Curves are plotted to minimum test points. Maximum variations expressed in current values are plus 10%.

**Application**—Like all high-voltage fuses, these refill units are intended to accommodate overloads, not to interrupt them. Accordingly, they feature fusible elements which are designed with a minimum melting current of 200% of the refill-unit ampere rating (for refill units rated 100 amperes or less) or 220% of the refill-unit ampere rating (for refill units rated over 100 amperes). As a result, these refill units have considerable peak-load capabilities; however, they should never be expected to carry in excess of the peak-load capabilities listed in S&C Data Bulletin 240-195.

Since these refill units have silver element construction which is not subject to damage by aging or transient overcurrents, it is unnecessary to replace unblown refill units in single-phase or three-phase installations when one or more refill units have blown.

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**SM Refill Units - S&C Slow Speed**

**Refill Unit**

<table>
<thead>
<tr>
<th>TCC Number</th>
<th>Vt Nom. Ratings</th>
<th>Ampere Ratios</th>
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<tbody>
<tr>
<td>119-4</td>
<td>1.2 through 34.5</td>
<td>100 through 2000</td>
</tr>
<tr>
<td>SM-5</td>
<td>4.16 through 14.4</td>
<td>150 through 2000</td>
</tr>
<tr>
<td>SM-5</td>
<td>25 and 34.5</td>
<td>150 through 2000</td>
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</tbody>
</table>

**MINIMUM MELTING TIME-CURRENT CHARACTERISTIC CURVES**

**SM REFILL UNITS - S&C SLOW SPEED**

**TIME IN SECONDS**

<table>
<thead>
<tr>
<th>CURRENT IN AMPERES</th>
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<tbody>
<tr>
<td>1000</td>
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</tbody>
</table>

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Supersedes TCC No. 119-4 dated 2-23-7E © 1985

S&C ELECTRIC COMPANY - Chicago
S&C ELECTRIC CANADA LTD. - Toronto

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