REASON FOR UPDATE: Content updated to reflect current files, file locations and example screenshots.

ASSOCIATED DOCUMENTS: N/A

1. PURPOSE

1.1 This procedure covers using the Cure Time Predictor (CTP) correctly. The CTP is based on the characterisation of a number of rubber compounds using their thermal conductivity, cure rate and the minimum and maximum cure temperatures. The correct interpretation of finish part profiles and composition is key to a suitable cure time prediction.

2. SCOPE

2.1 This document applies to compression or injection moulded rubber, fabric, and rubber fabric combination products, with or without moulded-in metal components.

2.2 The **Compression Moulding** section of the CTP Calculator allows for rubber and fabric materials to be selected and a percentage fabric specified as part of the calculations.

2.3 The **Injection Moulding** section of the CTP Calculator allows for only rubber materials to be selected and replaces the blank temperature parameter with a melt temperature one.

2.4 For all characterized materials and when suitable details are input (**Material** or combination of materials, **Section** and **Depth**, **Blank** or **Melt Temperature** and a **Mould Temperature**) the CTP Calculator will provide a **Cure Time**, a **Max Cure** and a **Scorch Time**.

2.5 For none characterized materials included in the CTP Calculator a calculated cure time is not possible but any **Process Instructions** that currently exist for curing finished parts will be given.

3. RESPONSIBILITY

3.1 The Materials Engineering Department is responsible for maintaining the CTP Microsoft Access database. It is the responsibility of each product Stream Manager, through their network of Team and Shift Leaders to enforce the implementation of this procedure. The CTP Microsoft Access database is only to be used by those who have been trained on it. This will include, but not be limited to, Product Stream Configurators, Shift Leaders and Team Leaders.

4. PROCEDURE

4.1 The CTP Calculator is a Microsoft Access database located on the public network drive in the Cure Time Predictor folder. The current file is named **Cure Time Predictor**

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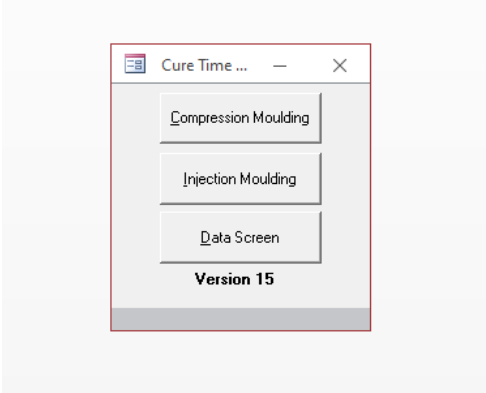
Version 15. The Cure Time Predictor folder can be opened with the link Cure Time Predictor Folder.

4.2 The CTP Calculator must only be accessed from the network drive you MUST NOT COPY to your own local files or desktop. The network drive version is the master document that will be updated with new compounds, fabrics or revisions to any existing materials as required.

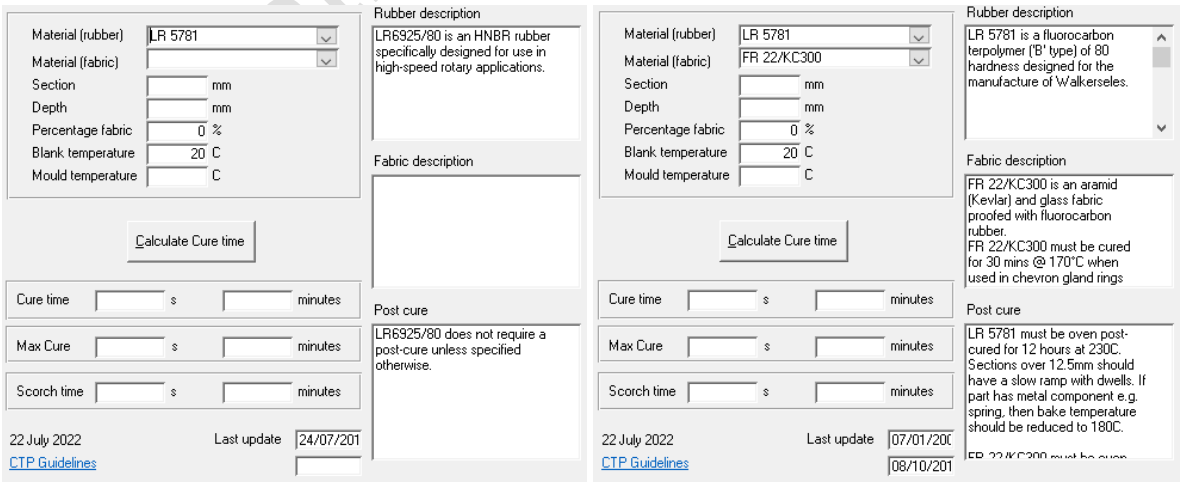
4.3 The CTP Calculator on the public network drive is a shared file and MUST BE CLOSED when not in use. Leaving the application open can create issues on system disconnect, system shut down or system sleep for other users.

4.4 Open the CTP Calculator Microsoft Access database and select **Compression Moulding** or **Injection Moulding** as the desired manufacturing method. The **Data Screen** option is used only when updating the CTP Calculator Microsoft Access database as per OPI 115.

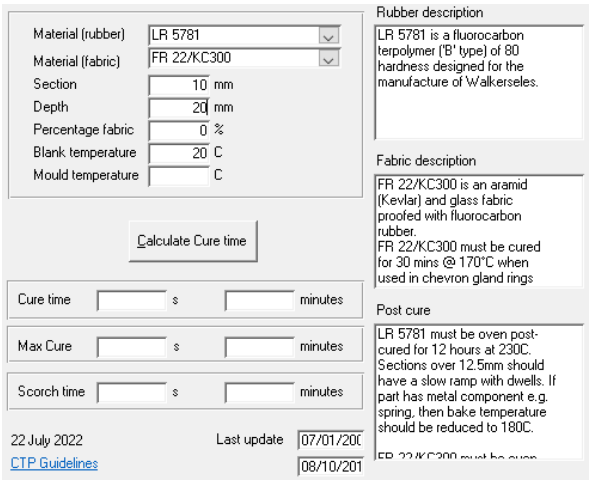


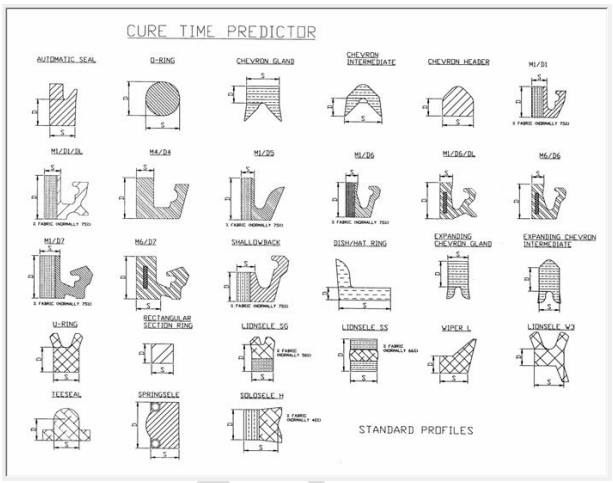
4.5 Select **Rubber Material** and / or **Fabric Material** from the drop down lists (**Injection Moulding** only allows selection of **Rubber Material**).

4.6 **Rubber Material Description** and / or **Fabric Material Description** and any P**ost Cure Description** details will be displayed for the selected materials.

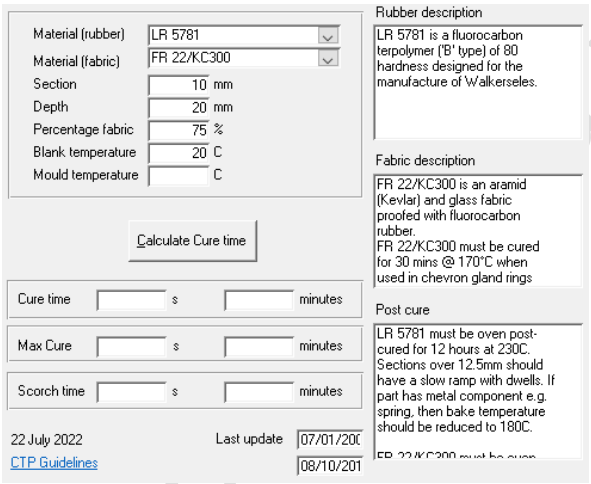


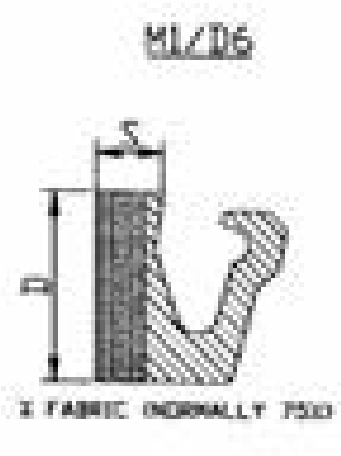
4.7 Enter **Section** and **Depth** based on the finished part drawing / moulded profile dimensions. DO NOT USE item description dimensions. See example profiles for **Section** and **Depth** selection guidance.





4.8 If applicable enter **Fabric Percentage** based on the finished part drawing / moulded profile dimensions. See example profiles for **Fabric Percentage** guidance.

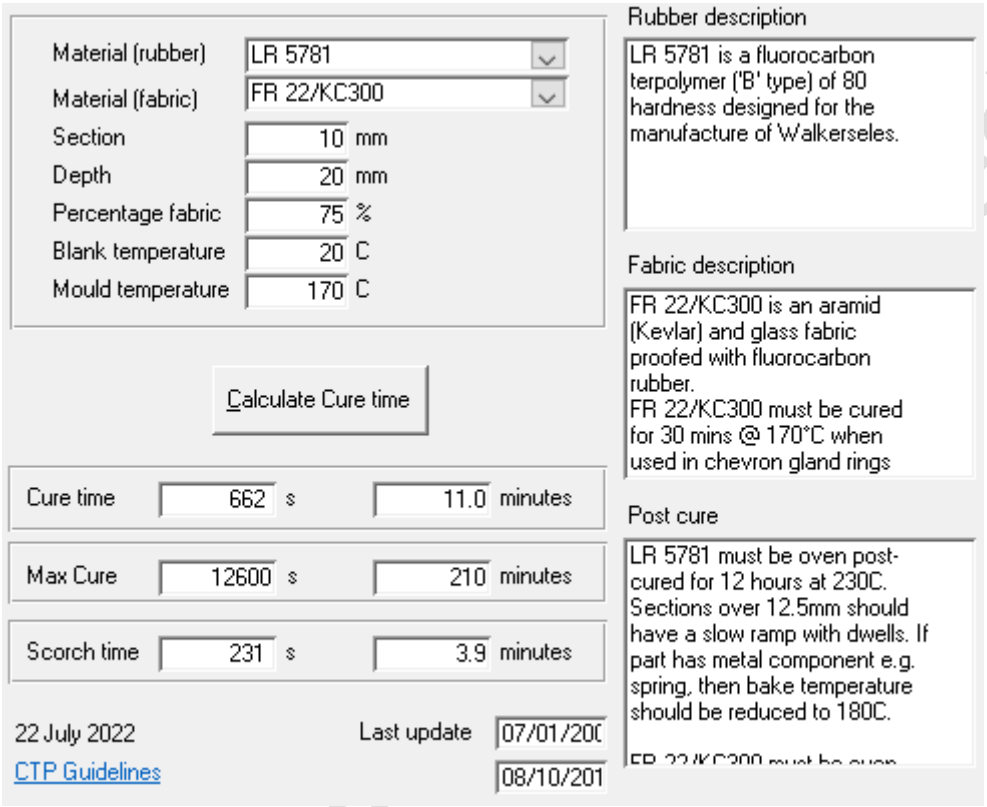




4.9 Enter **Blank / Melt Temperature**. Default **Blank Temperature** is ambient / room temperature of 20°C. Blank pre-heating is only required in specialised cases for larger or none standard profiles. **Melt Temperature** MUST have a value input and is typically 60°C - 100°C.

4.10 Enter **Moulding Temperature** in °C. This is the mould temperature NOT the press platens set temperature. This should be a decade or mid decade value as standard i.e. 170°C or 175°C NOT 173°C (Standardised moulding temperatures allow potential mould nesting).

4.11 Click the **Calculate Cure Time** button. Review CTP Calculator output for **Cure Time**, **Max Cure** and **Scorch Time**. A warning with further details will be displayed if any inputs are outside allowable limits i.e. **Moulding Temperature**. For none characterised materials the CTP Calculator will display any existing **Process Instructions** rather than display a calculated **Cure Time**, **Max Cure** and **Scorch Time**.



4.12 **Cure Time** is given in minutes and seconds. The calculated **Cure Time** should be rounded up to nearest minute or half minute as standard i.e. 6 mins or 6.5 mins NOT 6.3 mins (Standardised curing times allow potential mould nesting).

4.13 **Max Cure** is given in minutes and seconds. The calculated **Cure Time** MUST NOT exceed the max cure.

4.14 **Scorch Time** is given in minutes and seconds. The calculated **Scorch Time** MUST NOT be shorter than total mould loading and press closing time. Average compression moulding loading and closing time is approximately 1 to 1.5 minutes. (NOTE: this does **NOT** apply to **Injection Moulding** where scorch times as low as 20 to 30 secs can be acceptable).

4.15 If required adjust **Moulding Temperature** and re-calculate to ensure cure conditions meet the requirements of **Max Cure**, **Scorch Time** and material temperature limits.

4.16 Record CTP Calculator recommended **Cure Time** and **Post Cure** conditions and close CTP Calculator Microsoft Access database application (Either calculated or as per **Process Instructions**).

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