

# Online Spring Material Selector – User Documentation

## Introduction

The Spring Material Selector (SMS) is a web based database of spring materials. It replaces IST's Spring Material Selector CDROM.

This training session covers the following skills in using the SMS:

- Log in and out of the SMS
- Search the SMS for materials that meet particular requirements
- Review data on a specific material within the SMS
- Print data from the SMS

## Preparation

You will require the following to complete this session:

A web browser (on an Internet connected computer or on a computer with local access to a copy of the SMS) that is compatible with SMS. Browsers that are compatible include later versions of Internet Explorer, Chrome and Firefox.

A username and password to access SMS.

A printer (should you wish to print data from the SMS)

The URL of the Spring Material Selector. This will usually be provided by your trainer, but the live site is to be found at <http://www.springmaterials.com>

## Skills Required

You will need to know how to use a web browser to access a web site.



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## Starting the SMS

Type the URL of the SMS in to your web browser. The following screen will be displayed:

The screenshot shows the website's header with the IST logo (Institute of Spring Technology) and the title 'SPRING MATERIAL SELECTOR'. Navigation links for 'Existing users - log in here' and 'New users - Sign Up' are present. Below the header are three buttons: 'Feature overview', 'Detailed specifications', and 'Pricing'. The main content area features a title 'Spring Material Selector' and a descriptive paragraph: 'The Spring Material Selector from IST is a unique online database of spring materials, allowing you to quickly identify wire or strip grades for spring applications.' This is followed by another paragraph: 'Hundreds of material specifications and grades from around the world are included, giving information on physical and mechanical properties. Guidance is also given for corrosion resistance and corrosion protection, heat treatment, etc.' A third paragraph explains search capabilities: 'You can search by spring type, operating temperature, the environment in which the spring will be working, or find materials that match a specific chemical composition. When you've selected a specification, full mechanical properties are given. You are also shown a list of related specifications from other standards around the world are listed, so that you can compare them.' Below this is a screenshot of the search interface, showing a search bar, a list of results, and a detailed view of a selected material specification. Further down, text states: 'Conversion to PDF files allows you to save a specification, email it, and of course print it.' Another paragraph mentions: 'Because Spring Material Selector is hosted on IST's servers, it is kept up to date automatically. We are committed to continually improving the quality of our information, and are planning to add a number of additional national standards as well as more commercial grades.' The page is decorated with images of coiled wire and a roll of metal strip.

This is the Home Page of Spring Material Selector. To log in to the SMS, click the 'log in here' link and enter your user name and password in to the fields displayed on the screen. Then press the 'Sign In' button.

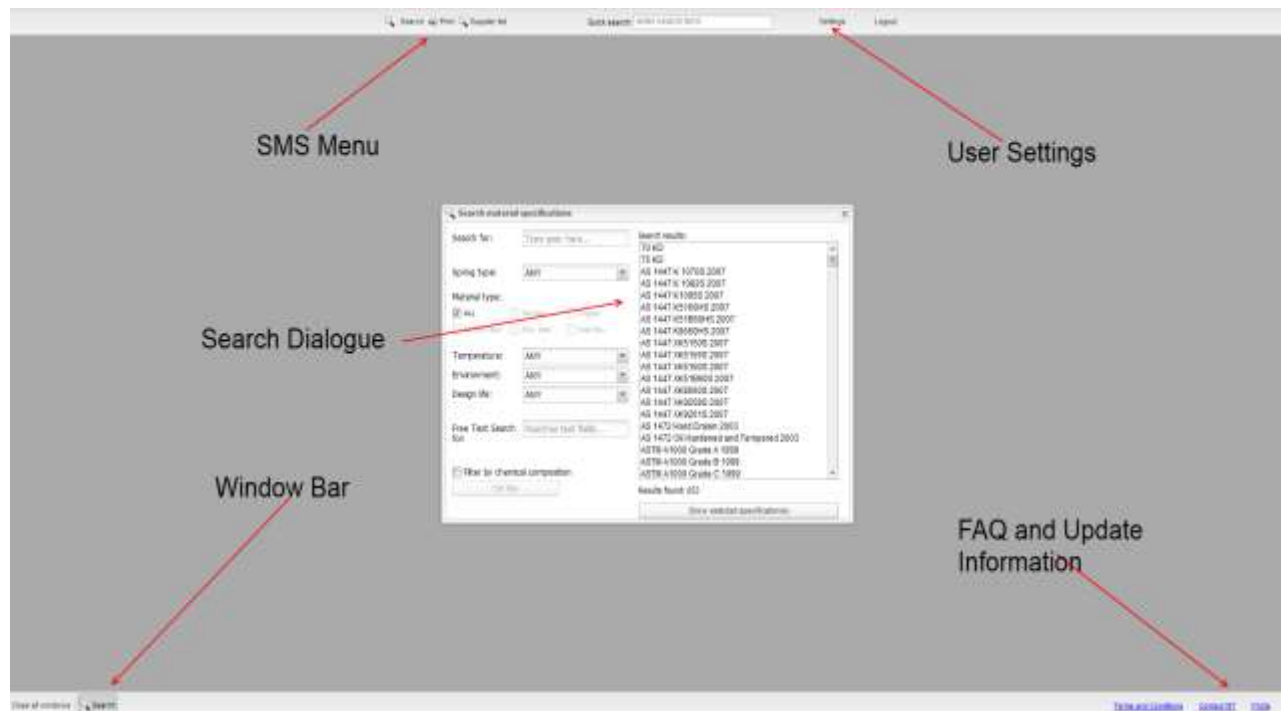
- If you have entered incorrect details, a warning message will be displayed.
- If you have entered correct details, you will be logged in to the SMS and will be able to use the system.

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## The SMS Desktop

The SMS Desktop is the screen from which all work is done in the SMS.

You can see then various sections of the screen below:



## SMS Menu

There are three buttons in the menu – Search will display the Search Dialogue, Print will allow you to print information about displayed materials and 'Supplier List' will list suppliers within SMS.

## User Settings

This button allows you to change your password and, for paying subscribers, review a history of subscription payments.

## Search Dialogue

This dialogue allows you to search for materials within the SMS.

## Window Bar

This displays a series of buttons, one for each dialogue displayed on the screen.

When you start to look at multiple materials on screen at once, a button will be displayed here for each material displayed.

## FAQ and Update Information

this is a list of frequently asked questions about the SMS. It is also where you will

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find information about the regular updates of SMS data.

### Exiting the SMS

You can leave the SMS in two ways:

- Pressing the Logout button
- Closing the browser window.



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## The Search Dialogue

The Search Dialogue allows you to search the SMS for materials that meet particular characteristics or select materials from a list of over 650 material specifications.

### Opening the Search Dialogue

When you log in to SMS, the Search Dialogue is opened automatically.

- If you close it, you can re-open it using the Search button on the SMS Menu
- If the dialogue is covered up by other open windows within SMS (e.g. materials windows, the printer dialogue, etc.) then you can press the Search button on the Window Bar at the foot of the screen to bring the dialogue back to the top of the windows displayed.

## The Search Dialogue

The search dialogue is shown below:

**Search material specifications**

Search for:

Spring type:

Material type:

ALL  Stainless  Copper  
 Carbon steel  Alloy steel  Heat Res.

Temperature:

Environment:

Design life:

Free Text Search for:

Filter by chemical composition

Search results:

- 70 KD
- 75 KD
- AS 1447 K 1070S 2007
- AS 1447 K 1082S 2007
- AS 1447 K1095S 2007
- AS 1447 K5160HS 2007
- AS 1447 K51B60HS 2007
- AS 1447 K8660HS 2007
- AS 1447 XK5150S 2007
- AS 1447 XK5155S 2007
- AS 1447 XK5160S 2007
- AS 1447 XK51B60S 2007
- AS 1447 XK8660S 2007
- AS 1447 XK9258S 2007
- AS 1447 XK9261S 2007
- AS 1472 Hard Drawn 2003
- AS 1472 Oil Hardened and Tempered 2003
- ASTM A1000 Grade A 1999
- ASTM A1000 Grade B 1999
- ASTM A1000 Grade C 1999

Results found: 653

The left hand side of this dialogue offers various ways of filtering the data.

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The right hand side of the dialogue gives a list of materials that meet the specified criteria.

### Viewing a Material Specification

A Material Specification can be viewed by double clicking on the specification's name in the list on the right hand side of the dialogue.

You can open more than one specification at once – each opens in a separate window.

To avoid having to scroll up and down the materials list, you can filter the list of material specifications displayed by using the filters on the left hand side of the dialogue.

### Points to note about the filter criteria

It is important to note the following about the filter criteria.

- Text based filter fields, like the 'Search For' and 'Free Text Search For' are case-insensitive – that is, they treat A and a as the same. However, they do take spaces and punctuation in to account.
- The text based fields filter based on finding the entered text anywhere in the relevant materials data. Thus, if you enter 'BH' in to the Search For field it will find the text in the Specification name "BS 4659 **BH**21 1989"
- The filters are additive; that is, the settings specified in each section ALL have to be met for a materials specification to turn up in the list of suitable materials on the right. For example, selecting 'Compression' as spring type and 'Sub Zero (down to -200)' as temperature range will return a list of materials suitable for Compression springs **AND** suitable for operating at that temperature.
- When no criteria are set, all material specifications in the SMS are listed on the screen.
- The filters are applied in 'real time' – when you modify a filter option the list of suitable materials will be updated immediately.

### Using the Filters

When no filters are set, the list of materials displayed will include all the materials in



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the SMS database.

Before applying filters, it is always worthwhile checking that the filters are set to their default values. The default (no effect) settings for the filters are shown below:

The screenshot shows a web interface for filtering materials. It includes a search bar labeled 'Search for:' with the placeholder text 'Type spec here...'. Below it is a 'Spring type:' dropdown menu set to 'ANY'. The 'Material type:' section has a grid of checkboxes: 'ALL' (checked), 'Stainless', 'Copper', 'Carbon steel', 'Alloy steel', and 'Heat Res.'. There are three more dropdown menus for 'Temperature:', 'Environment:', and 'Design life:', all set to 'ANY'. A 'Free Text Search for:' field contains the placeholder 'Searches text fields...'. At the bottom, there is a checkbox for 'Filter by chemical composition' and an 'Edit filter' button.

**Search For** – typing text in here will filter the list based on whether the entered text appears in the Materials Specification Name.

**Spring type** – Select the particular spring type you are intending to use the material for from the dropdown.

**Material Type** – when 'All' is ticked, materials are listed irrespective of the type of material they are. Clearing 'All' and selecting one or more of the materials checkboxes will filter based on whether the materials are in the selected categories.

**Temperature** – filters from the dropdown list of ranges of operating temperatures.

**Environment** – provides filtering based on the environment that a particular material specification can be expected to operate in.

**Design Life** – filters based on whether the design life is Static / Dynamic

**Free Text Search** – this filters the displayed specification list by checking the text entered against free-format text fields within the database that contain information on heat treatment, corrosion resistance and corrosion protection.

**Filter by Chemical Composition** – this filter allows materials to be filtered based on composition. Checking the checkbox enabled the 'Edit filter' button, which when



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pressed displays a new dialogue:

Element	Value	Element	Value
C carbon	<input type="text"/>	Nb niobium	<input type="text"/>
Si silicon	<input type="text"/>	Ti titanium	<input type="text"/>
Mn manganese	<input type="text"/>	B boron	<input type="text"/>
S sulphur	<input type="text"/>	Fe iron	<input type="text"/>
P phosphorus	<input type="text"/>	Co cobalt	<input type="text"/>
Cr chromium	<input type="text"/>	Zr zirconium	<input type="text"/>
V vanadium	<input type="text"/>	Pb lead	<input type="text"/>
Mo molybdenum	<input type="text"/>	Be beryllium	<input type="text"/>
Ni nickel	<input type="text"/>	Sn tin	<input type="text"/>
Cu copper	<input type="text"/>	H hydrogen	<input type="text"/>
N nitrogen	<input type="text"/>	Imp impurities	<input type="text"/>
Al aluminium	<input type="text"/>		

Reset OK Cancel

**Reset** clears any existing values.

**OK** will filter the database based on the values entered.

**Cancel** closes the screen without filtering.

The value entered should be the ideal value in terms of percentage composition that you are seeking for that material. If you don't care what percentage composition is, then leave the box blank. The filter will then return material specifications where the entered value lies between the minimum and maximum recorded percentage values for that specification.

For example, entering 0.5 in the Manganese field and pressing OK will filter the displayed list to those materials where the minimum recorded manganese percentage is less than 0.5 and the maximum recorded manganese percentage is greater than 0.5.

Example materials returned include the following:

Specification Name	Minimum Mn %	Maximum Mn %
ASTM A227/A227M 1999	0.3	1.3
BS 5770 Part 2 CS95 1981	0.3	0.6
EN 10270-1 SL 2011	0.4	1.2

The following materials would NOT be returned:



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Specification Name	Minimum Mn %	Maximum Mn %
AS 1447 K 1070S 2007	0.6	0.9
AS 1472 Oil Hardened and Tempered 2003	0.6	1.2
ISO 4960 CS50 (cold rolled) 1990	0.6	0.9

The chemical composition filter is only active when:

- There are boxes with values in them.
- When the 'Filter by Chemical Composition' checkbox is ticked.

Like all the filters, the chemical composition filter is added to any other filters in effect.



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## Viewing a Material Specification

You can view a Material Specification in two ways:

- By double clicking on the name of the Material Specification in the list of names.
- By single clicking on the name to highlight it and then pressing the 'Show Selected Specification(s)' button.

Note that you can view more than one Material Specification at once.

This is done by holding the Ctrl key down on your computer keyboard and then single clicking on the names of the materials that you wish to view. Then press the 'Show Selected Specification(s)' button.

## Material Specification Window

The information about a material is displayed as shown below:

IS 4454-2 FDCrV-B 2001

Material Details | Material Suppliers | Coating Suppliers | Chemical Composition | Tensile Strength | Relaxation | Fatigue

Specification: **IS 4454-2 FDCrV-B 2001**  
Material: **Alloy Steels** Form: **Wire**

Equivalent specifications:  
DIN 17223-2 FDCrV 1990  
ISO 8458-3 FDCrV-B 2002

**Material Size:**  
Min Diameter/Thickness: **0** mm Max Diameter/Thickness: **0** mm

**Typical Properties:**  
E Modulus: **206.8** kN/mm<sup>2</sup>  
G Modulus: **79.5** kN/mm<sup>2</sup>  
Density: **7.83** kg/dm<sup>3</sup>  
Electrical Conductivity: **7** % IACS

**Maximum recommended Corrected Static/Quasi-Static stress:**  
*Working Stress as % Tensile Stress:*

	Unprestressed	Prestressed
Stressed in torsion:	53	70
Stressed in bending:	70	100

**Heat Treatment:**  
Stress relieve 350 - 400°C

**Corrosion Resistance:**  
Poor - for environments other than a dry atmosphere (such as inside buildings or equipment), some form of corrosion protection will be required.

**Corrosion Protection:**  
1) Barrier treatments (paints and plastic) - provide corrosion resistance provided that they are not damaged - will adhere better to a phosphated surface - generally used for larger section sizes.  
2) Proprietary non-embrittling finishes - generally zinc-based (e.g. Dacromet, Delta finishes, etc.) are the preferred option for this type of material.  
3) Electroplated coatings (generally zinc) with a subsequent passivation treatment - a post-coating de-

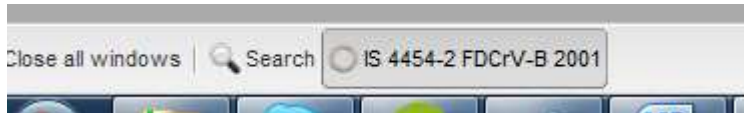
The display window is split in to two sections – a menu bar across the top of the window, and the information below. The menu bar has seven buttons, each button displaying a different facet of the information available on the material.

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The button that is currently 'pressed' is displayed in a slightly darker shade of grey – here the 'Material details' button is pressed and that general details about the material are displayed.

### Changes to the Window Bar

If you look at the bottom of the screen, in the 'Window Bar', you will see that there is an additional button there now featuring the Material Specification name:



If you open more than one Material Specification at once, a button will be added here for each Material Specification Window opened. Pressing the button will bring that particular Material Specification to the front of the screen.

### Menu Options

Pressing the buttons along the top of the screen will display appropriate data in the Material Specification Window. When you open a Material Specification for the first time, the 'Material Details' data will be shown.

### Material Details

This window displays basic characteristics of the material.

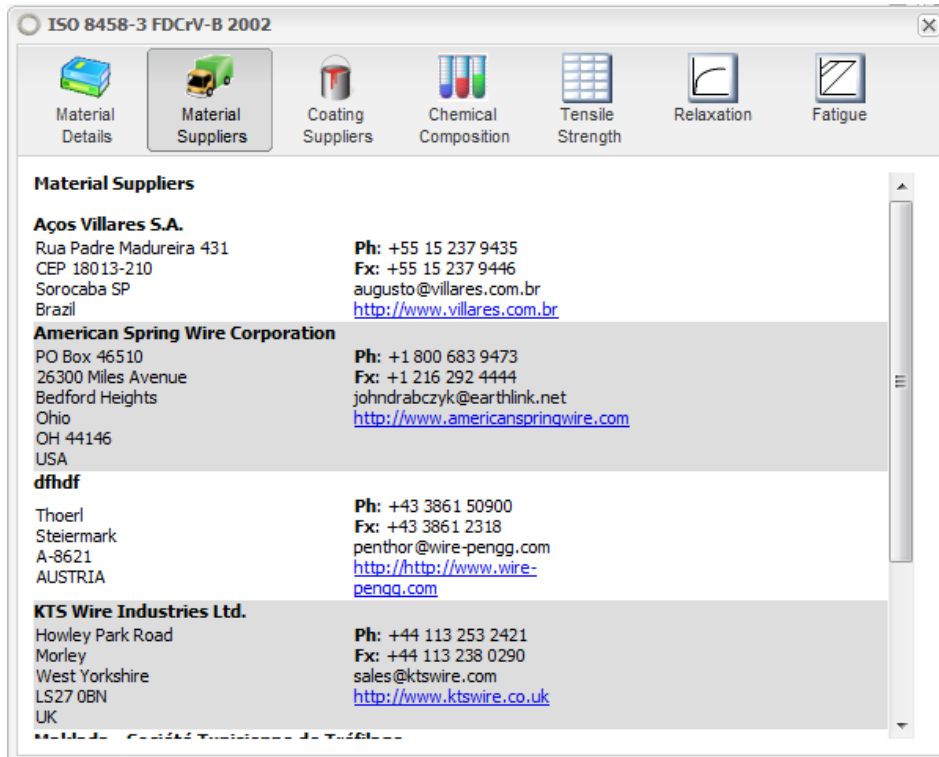
The list of Equivalent Specifications shown on the right hand side of the screen gives a list of materials that IST regards as being equivalent for most functions.

Double clicking on a Material Specification name in this list will open a Window for that particular specification and will allow you to view the material details.

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## Material Suppliers

This window displays a list of companies that supply the material. Contact details of the companies concerned are listed.



Clicking on the link to the supplier's website will open that site up in a separate browser window. The list is scrollable using the scroll bar on the right hand side of the Window.

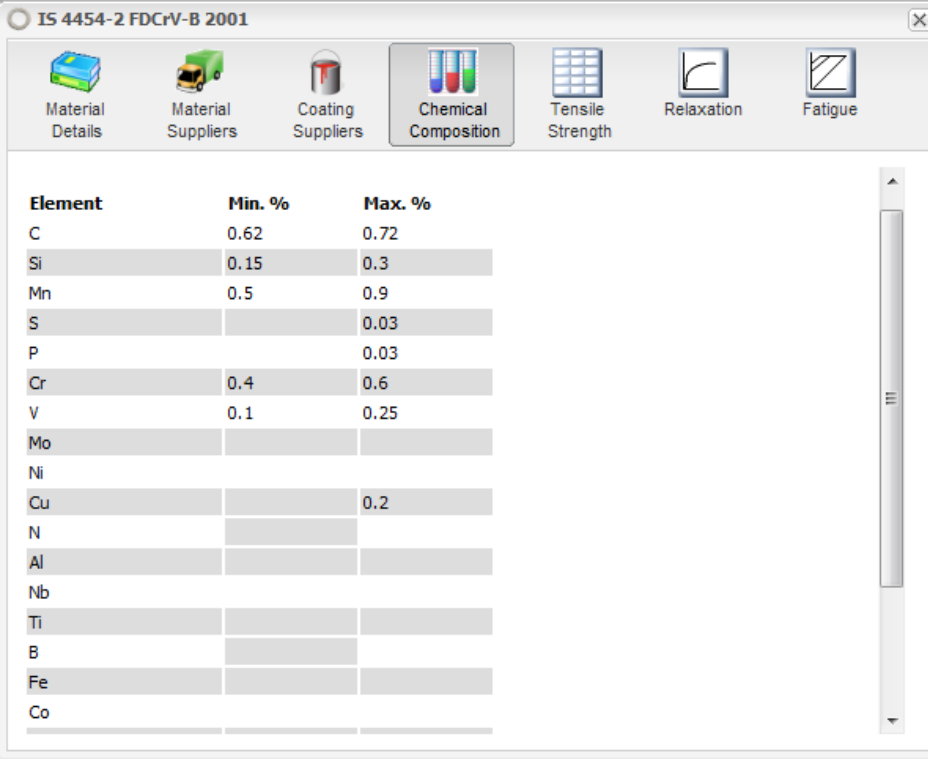
## Coating Suppliers

This Window, similar in layout to that for Material Suppliers, list suppliers of coatings suitable for the Material in question.

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## Chemical Composition

This Window displays details of the Chemical Composition of the Material concerned.



Element	Min. %	Max. %
C	0.62	0.72
Si	0.15	0.3
Mn	0.5	0.9
S		0.03
P		0.03
Cr	0.4	0.6
V	0.1	0.25
Mo		
Ni		
Cu		0.2
N		
Al		
Nb		
Ti		
B		
Fe		
Co		

The table details the chemical composition relevant to the material's characteristics, described in terms of maximum and minimum percentage.

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## Tensile Strength

This Window displays the tensile strength of the material specification being examined.

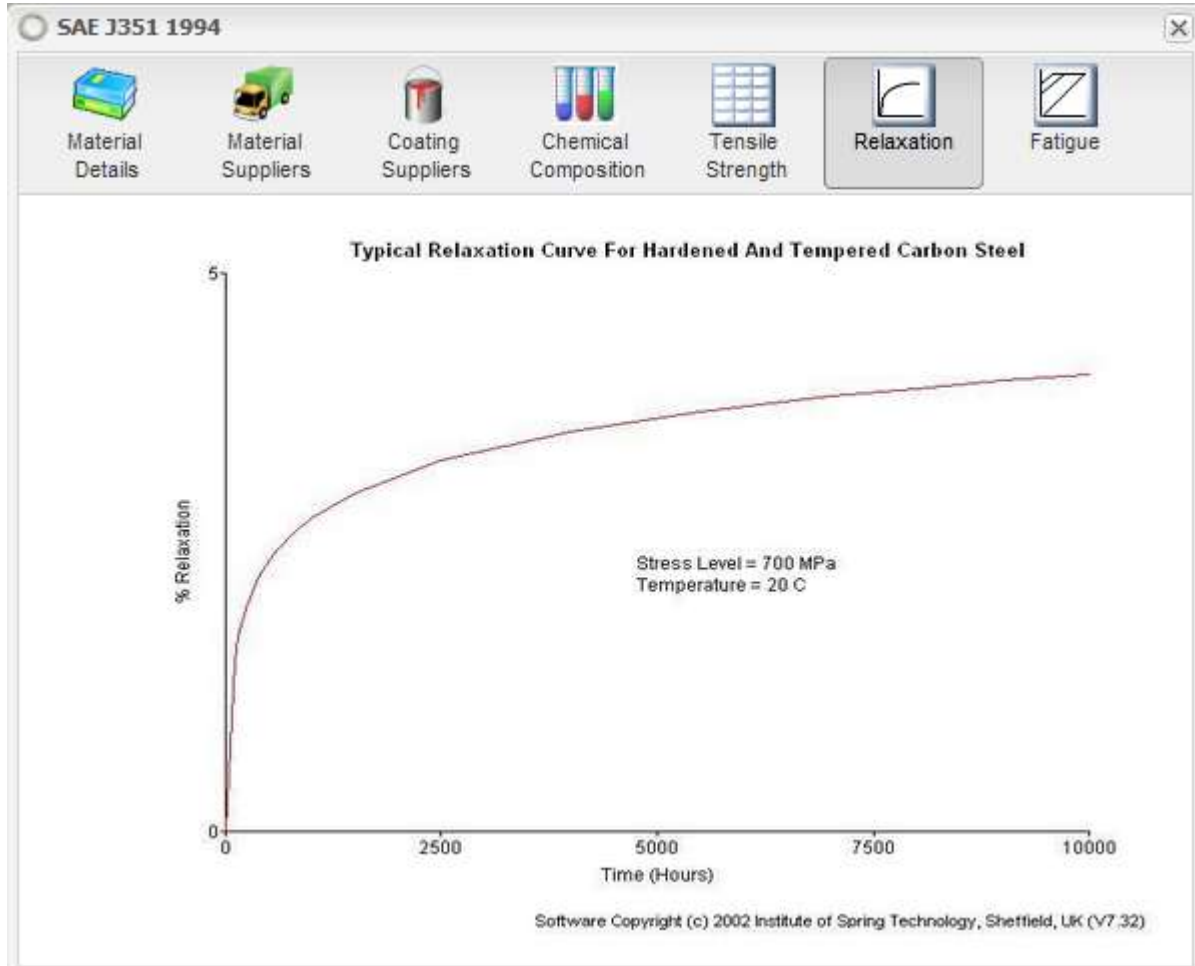
Tensile Strength		
Nom. Diameter	Min	Max.
2.337	1655	1793
3.251	1620	1758
4.115	1586	1724
4.877	1551	1689
5.715	1517	1655
6.35	1482	1620

If there is more than one grade within the Specification, then the minimum and maximum tensile strengths for each available diameter are listed for up to 5 grades.

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## Relaxation

This button will display a typical Relaxation Curve for the Specification selected, if such data is available within the SMS. The graphical data is not available for all material specifications at the time of writing.

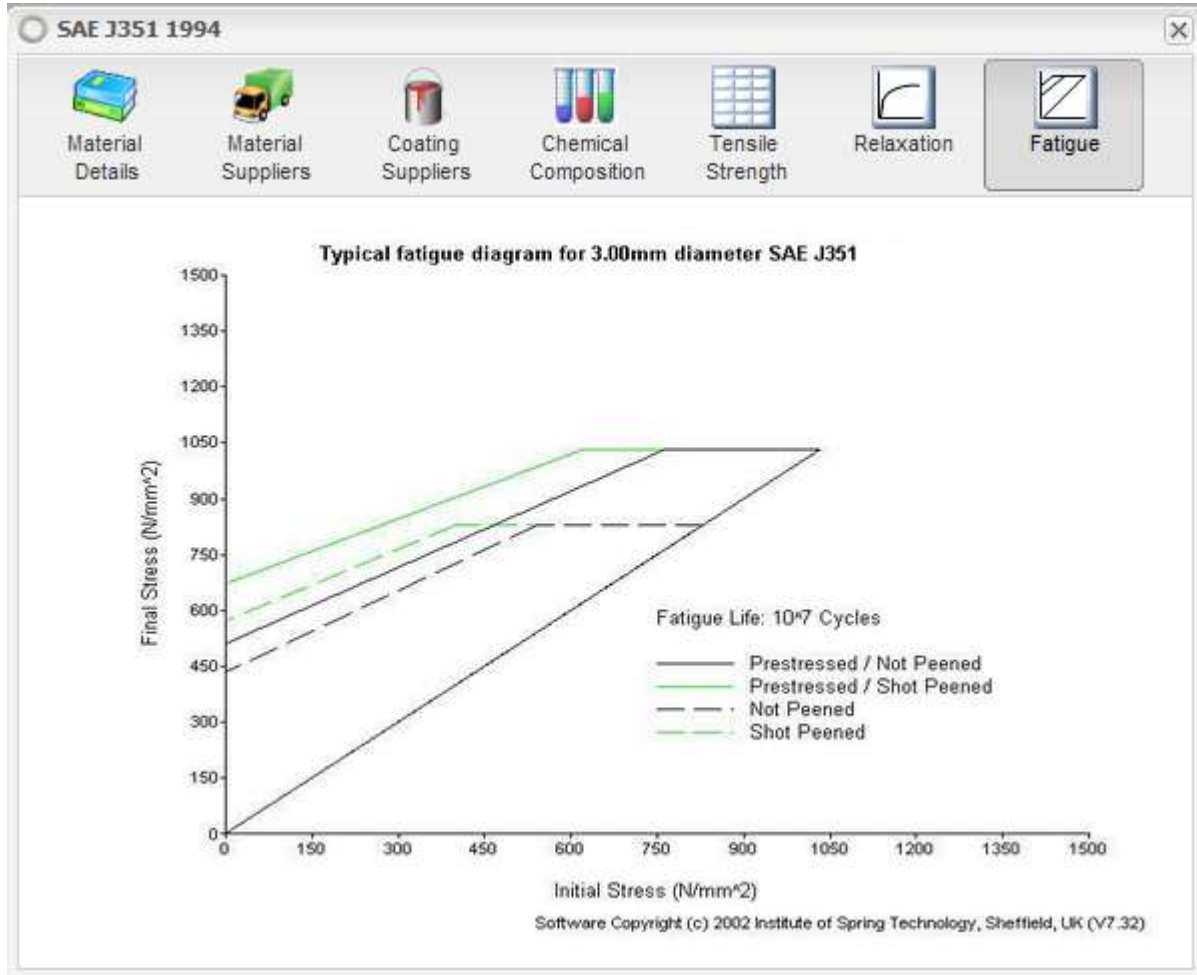




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## Fatigue

This button will display a typical Fatigue Curve for the Specification selected, if such data is available within the SMS. The graphical data is not available for all material specifications at the time of writing.



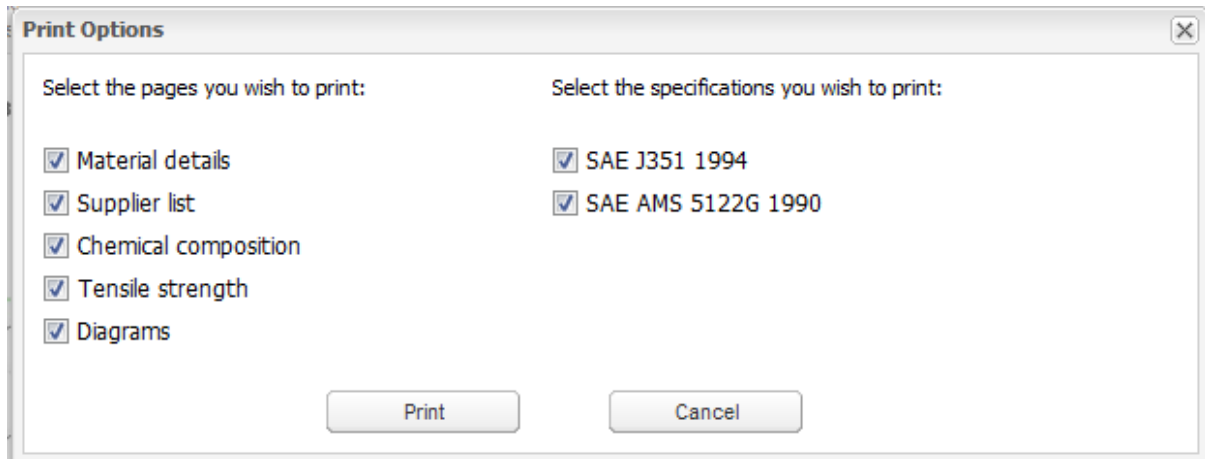
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### Print

This option is available from the main desktop menu bar. The Print button allows you to generate a PDF file containing a printable version of all the data available in the SMS about a material.

The Print button prints data from any open Material Specification Windows.

To use the Print function, press the Print button. A dialogue box similar to the below will be displayed.



On the right hand side of the dialogue you can see a list of the currently opened Material Specification Windows. In this case, we have two specifications opened – **SAE J351 1994** and **SAE AMS 5122G 1990**.

On the left hand side of the dialogue there are a series of check boxes that allow you to specify which parts of the Materials Specification information you want included in the PDF file. These checkboxes correspond to the menu buttons on the Materials Specification Window.

- To create a PDF file that contains ALL the data, leave all of the checkboxes ticked.
- To create MULTIPLE PDF files – one for each opened Material Specification Window – leave all the listed Material Specification checkboxes ticked.

When you press the Print button, PDF files will be created and downloaded to your web browser.

**NOTE** – this means you will require a PDF Reader Add-In or program available on your PC.

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The PDF files created can be printed or saved to your PC, from where you can email them to colleagues.



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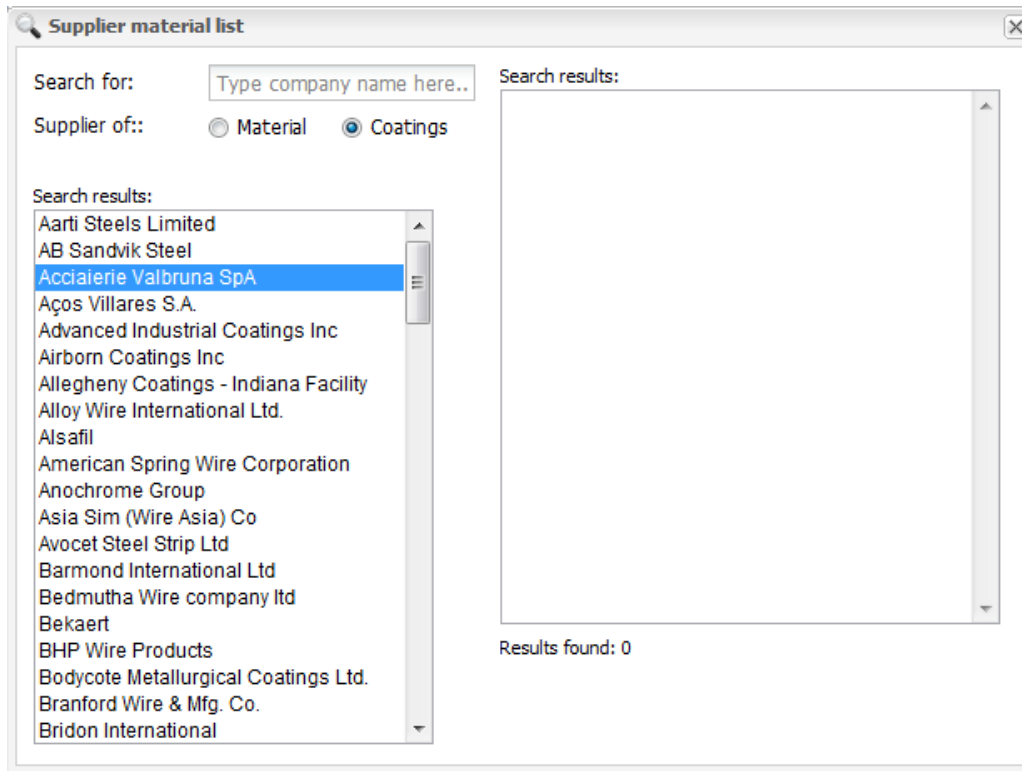
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## Supplier List

This menu option allows you to see what materials are listed by particular suppliers.



Select a Supplier from the list, and check the Material or Coatings radio button to see what Materials or Coatings the company selected supplies.

## Quick Search

This option on the main SMS menu allows you to quickly list Material Specifications



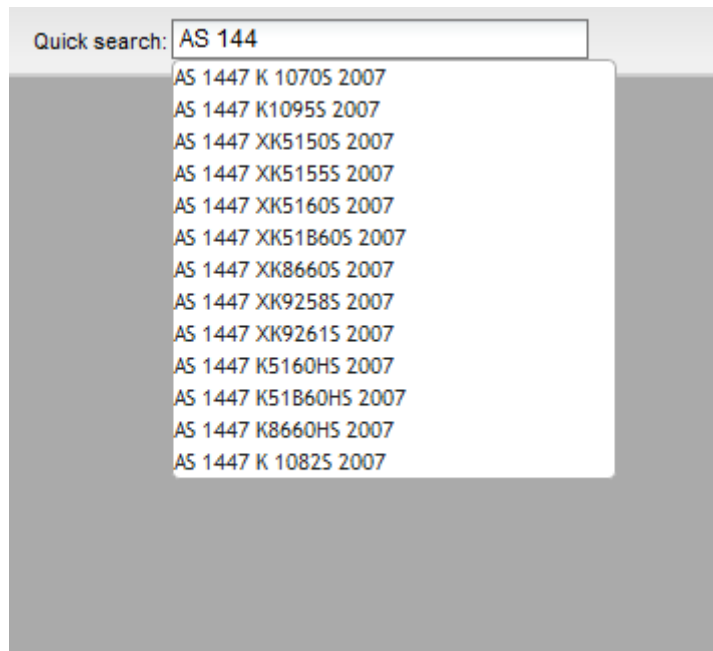
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without using the Search dialogue box. Enter in part of the Material Specification Name, as shown below:

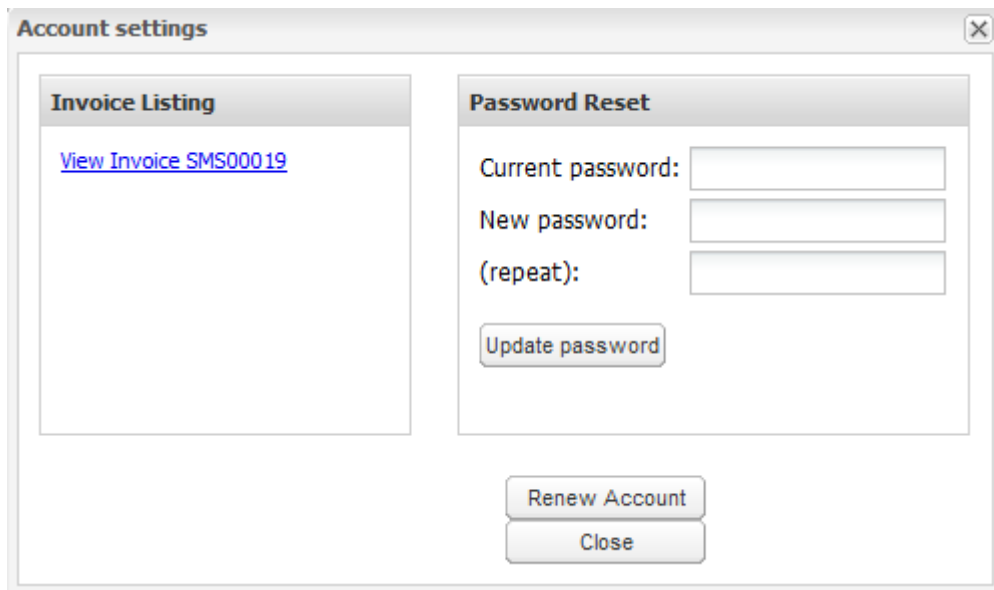


You can then select the material from this list.

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## Settings

This option on the SMS Menu allows you to modify your password, and view paid invoices.



The screenshot shows a window titled "Account settings" with a close button (X) in the top right corner. The window is divided into two main sections: "Invoice Listing" on the left and "Password Reset" on the right. In the "Invoice Listing" section, there is a blue hyperlink labeled "View Invoice SMS00019". The "Password Reset" section contains three input fields: "Current password:", "New password:", and "(repeat):". Below these fields is a button labeled "Update password". At the bottom of the window, there are two buttons: "Renew Account" and "Close".

## Changing Password

Enter your current password and the new password that you wish to set, twice, as indicated on the form.

Then press the Update Password button.

## Viewing Invoice

Click on the relevant Invoice link in the left hand column of the window.

## Renewing your account

If you are renewing a paid account, press the Renew Account button and complete the form.

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### What's new on SMS?

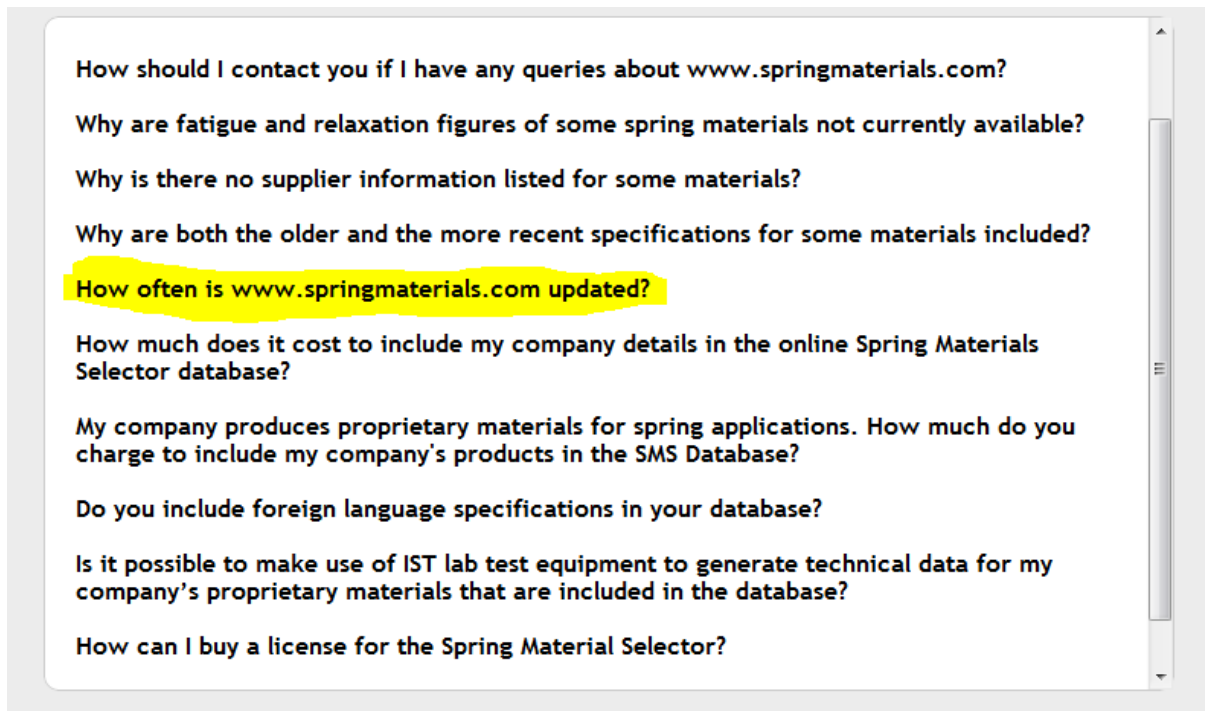
The SMS database is updated on a regular basis, with corrections to existing data or data about new specifications.

If you are a subscriber, you will be emailed when such an update takes place.

If you wish to check what's changed in the SMS, select the FAQs link on the bottom right of the screen.



Within the displayed list of FAQs, select the 'How often is [www.springmaterials.com](http://www.springmaterials.com) updated?' question:



Then select the 'Spring Materials Data Updates' link – a list of updates will be displayed for you to review.