



Full Speed Fabrics Inc.

Background – the business context¹

Full Speed Fabrics Inc. is a fabric manufacturer specializing in the knitting and finishing of high-tech fabrics for the sportswear industry. The company had 3 years of experience in the development and production of swimsuit fabrics made of nylon/spandex.

At a meeting in February 2000, their R&D department took on the challenge of developing a new swimwear fabric line using a new type of polyamide yarn blended with a conventional spandex filament yarn.

The company has filed a SR&ED claim for work on this project carried out during the fiscal year ending December 31, 2000. They are now in the process of filing a new claim for 2001.

2000 Claim

1. Detailed Project Description²

PROJECT NAME: *Uniform 2D Stretch Swimsuit*

START DATE: February 2000

END DATE: September 2000

Section A: Scientific or Technological Objectives

Develop a knitting and finishing process for a new textured polyamide blend yarn in order to produce swimwear fabric with uniform two-dimensional stretch of 25%.

Section B: Technological or Knowledge Base Level

The performance of a textile depends on the yarn (and other materials), the construction, the equipment used to produce it, and the manufacturing process, including any post-treatment. The “stretch” target might be met through changing the yarn, by changing the textile construction, or with the help of modifications in the post-treatment.

Before starting the project, the following knowledge was available:

- The company could manufacture a product with plenty of stretch in the warp direction but limited stretch in the weft direction. Currently available knitting constructions result in a product with plenty of stretch in the machine direction (length) but insufficient in the width, as demonstrated in Test-1 below.

¹ Note that the claimant is not required to provide a "background section" with the project description. However, this information material may be helpful in providing the project context.

² The claimant is required to provide a project description answering the questions in the T661, *Claim for Scientific Research and Experimental Development (SR&ED) in Canada* (www.cra-arc.gc.ca/E/pbg/tf/t661/README.html). This section should provide a set of answers that clearly explains why the claimant believes the work is eligible.

- The available polyamide based yarns provide limited stretch that needs compensation from a higher level of spandex. Changing the yarn will impact on the amount of feed on the knitting machine, dye colour absorption, reaction to finish treatments, and the reaction of the finished textile when exposed to chemicals such as chlorine and algacide.
- Changing the structure or the amount of spandex could improve the stretch in the width direction, but this was expected to compromise the stretch in the warp direction. The appearance would suffer from this compromise; the spandex could also cause a surface defect known as “smile up”.
- Modifications to the finishing conditions might give a small amount of stretch in the weft direction (1-2%), but previous experience had shown that this would not be sufficient to achieve their goals.

Knitting trials and finishing work were required to establish the operating conditions of the process that would produce a fabric with sufficient stretch (25%) in the weft direction (width).

Section C: Scientific or Technological Advancement

The technological advancement sought was to develop a new process in order to produce fabric with uniform two-dimensional stretch of 25%. In order to achieve this advancement, the company had to address and overcome existing limitations with the weaving equipment, processing parameters, and yarn materials, integrating into the new process the know-how developed in a series of experimental runs.

Section D: Description of Work in the Tax Year

Test	Start/end	Work done	Details	Stretch Results
1	2000-02-10	Initial run(s) with the known construction and material (with conventional polyamide)		Length: 31% Width: 18%
2	2000-02-17 to 2000-03-14	Trials with a new textured polyamide	15 knitting trials 6 finishing trials	Length: 27% Width: 19%
3	2000-03-17 to 2000-05-29	Modifications of the spandex feeding on the knitting machine	21 knitting trials 16 finishing trials	Length: 24% Width: 21%
4	2000-05-29 to 2000-07-08	Establish the heat setting temperature range	10 finishing trials	Length: 25.5% Width: 25%
5	2000-08-10		First “commercial” runs producing material that is sold to the customer.	Length: 25.5% Width: 25%

Note: In an actual project description, the claimant must indicate the length of each of these trials and the type of equipment used, together with a brief description of the relationship of the trials to the technological advancement that is being attempted. The claimant should provide a brief explanation of why all the trials were required and what was achieved during each of them.

This level of detail is not provided in the example to allow us to focus on the goal of demonstrating how SR&ED can start, stop and start again during the development of a product or process.

Section E: Supporting Information

- Equipment set-up instructions for each trial
- Samples and specifications from knitting trials
- Annotated production sheets showing results and samples of finishing trials

2. Comments

Test 1: the initial runs using the company's existing technology were used to establish base-line data and the limits of the current technology. These were commercial runs producing a viable product to meet existing customer orders and therefore were not part of the eligible project. However, the work required to analyse the data from these initial runs was considered to be part of the SR&ED project.

Starting on February 17th with Test-2, the company conducted a planned series of trials to develop the process for knitting the new yarn blend that would produce uniform 2-D stretch fabrics with the new polyamide blend yarn. This entailed trials with a new textured polyamide, modifying the construction of the textile, and determining the benefits that could be achieved with heat treatment. In the process, it was necessary to resolve the uncertainties associated with finding ways to increase the stretch in the width without either losing too much strength in the machine direction, creating new problems with the surface, or by requiring prohibitively expensive raw materials.

The modified process was considered proven after the completion of the finishing (heat setting) trials (Test-4) because the stretch criterion had been met. The technological objectives of the project were achieved.

As a result of this work, the company has improved the technology of knitting stretch fabrics by adding the capability of producing uniform 2-D stretch fabrics. Therefore, Tests 2 to 4 meet the definition of "experimental development".

The last run, Test-5, was the first commercial run and therefore, it was not part of the eligible trials.

3. Work Carried out in 2001

In 2000 the company had claimed work to develop a swimwear fabric (style number QBL200002X) made with a new type of polyamide combined with a conventional spandex filament yarn. It had succeeded in developing and commercializing Polyspam, a polyamide/spandex swimwear fabric that could stretch 25% in all directions.

Market response to this product was good but the colour selection was too narrow and, as a result, sales were not great enough to achieve the desired profitability. In addition the material was too expensive. In January 2001, the R&D team also took on the challenge of sourcing new yarn supply in order to develop the new shades.

At the same time, the company needed to investigate the cause of the return of almost 50 rolls of material by two customers. Some of the material was being returned because of poor chlorine stability. The company needed to identify the cause of the problem and ensure that the product met the required chlorine stability rating of 4-5.

The following trials were carried out during the taxation year to resolve these issues:

Note: *In an actual project description, the length of each of these trials must be provided together with a brief description of the relationship to the technological advancement that is being attempted. The claimant should provide a brief explanation of why all the trials were required and what was achieved during them.*

Phase	Start/end	Objective	Work done	Results
1	Phase 1: 2001-01-07 to 2001-01-28	Reduce cost by using cheaper source of spandex	6 knitting trials 3 finishing trials	6.7% cost reduction
2	Phase 2: 2001-01-15 to 2001-02-28	Develop 7 new shades including tests on chlorine stability (laboratory work)	15 regular dye lots	All shades OK
3	Phase 3: 2001-03-02 to 2001-05-29	Investigation of the effect of several chemicals used in swimming pools	147 laboratory trials	Algaecide X caused some fading of the red component

EXAMPLE - A PROJECT THAT FINISHES THEN RESTARTS

4	Phase 4: 2001-05-29 to 2001-06-14	Find a dye combination not affected by algaecide X	Dye combination trials in lab. Select best combination 2 rolls dyed and finished with new components	All rolls meet the specifications
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Comments

In 2000, the claimant had met the objectives set at the time. The company started commercial production and filled orders. The SR&ED project was considered completed when the claim was filed.

The **returned material** from two customers cannot be considered part of material consumed for the project since it was made to fill commercial orders after the end of the previous year's project. When the material was returned, the company had completed the process development. The material was returned because of colour fading, not as a result of an SR&ED project.

Although in 2001 the claimant is working on the same product, the company was addressing new problems, one of which required them to start an SR&ED project.

Phase 1: Finding a cheaper source of spandex does not require SR&ED. This is routine work to evaluate a new raw material.

Phase 2: The new shade developments also did not require SR&ED. These activities do not meet the requirements of SR&ED because the problem was solved using generally available techniques and knowledge.

Phase 3: The work on the colour stability required a systematic investigation using testing and analysis to determine why the material fades, despite passing the accelerated chlorine tests. This work was undertaken in order to identify and understand the cause of the fading. The results of the lab trials were not predictable and the knowledge of the company was advanced by this work. The analysis required to determine which algaecides cause the fading of red pigments provided the company with a new understanding of relationships between algaecides and colour stability. This work meets the definition of applied research as set out in subsection 248(1)(b) of the *Income Tax Act* (ITA), because it was a systematic investigation carried out by means of experiments and analysis which advanced the company's scientific knowledge with respect to the interaction of pigments and various chemicals including algaecides.

Phase 4: The experimentation required to find the dye combination that offers a more stable red colour in presence of algaecide X also qualifies as part of the project described in phase 3. After the completion of phase 3, it remains uncertain that Full Speed Fabrics could develop a dye combination that was stable to the fading effects of algaecide X within the constraints of the

application. Although the company had identified the probable cause of the fading and potential solutions, they still needed to apply this new knowledge to develop a modified product and process.

Application of the new know-how to produce a commercial product may or may not require SR&ED, depending on the facts in the specific circumstances. If SR&ED is required, then the trial (or trials) required to develop the modified product (and a process for its manufacture) may result in the presence of 'Experimental Production' or 'Commercial Production with Experimental Development'.

In this case the claimant was able to support the need for SR&ED carried out in the context of Commercial Production³ during phase 4. They were thus able to claim the additional work required to advance their technology during the trials.

If the material produced in these trials is sold, then the recapture rules apply (Recapture of Investment Tax Credit, SR&ED 2000-04R2, www.cra-arc.gc.ca/taxcredit/sred/publications/sr0618-e.html).

³ A discussion of how to distinguish between Experimental Production and Commercial Production with Experimental Development Work is beyond the scope of this example. Application Policy 2002-02R2, *Experimental Production and Commercial Production with Experimental Development Work - Allowable SR&ED Expenditures* (<http://www.cra-arc.gc.ca/taxcredit/sred/publications/ap2002-02r2-e.html>) provides a methodology that can be used for distinguishing between 'Experimental Production' and 'Commercial Production with Experimental Development'. This document also explains how to determine the allowable SR&ED expenditures associated with these.