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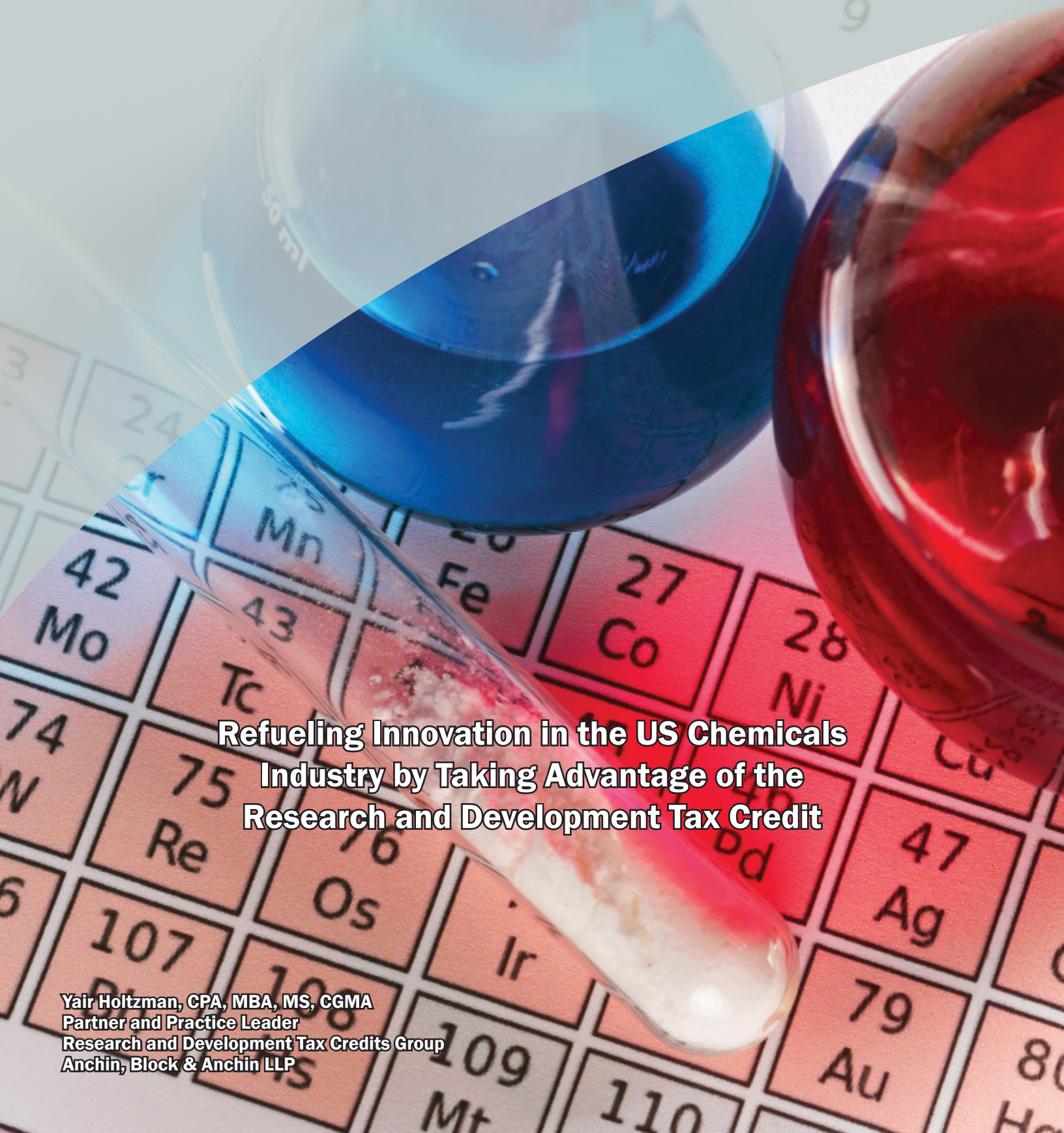

Refueling Innovation in the US Chemicals Industry by Taking Advantage of the Research and Development Tax Credit

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KEYWORDS: Chemistry, innovation, development, uncertainty, experimentation, testing, marketplace.

ABSTRACT

The federal Research and Development (R&D) tax credit, also known as the Research and Experimentation (R&E) tax credit is a major US economic incentive intended to encourage innovation and manufacturing within the US. It can provide companies with a significant, direct reduction in income tax liability for increasing their investment in scientific and technology based development projects compared to the previous three years. This investment is usually in the form of qualifying employee activities and other expenses related to product and process development, where the outcome is uncertain. It is therefore worthwhile for any US based business in the chemical industry that is attempting to innovate to consult with an R&D tax credit professional if they are not already claiming this credit. Even if a company is already claiming this credit it is worth examining to ensure this benefit is truly optimized.

OVERVIEW

The chemicals industry is an essential component of the U.S. economy, driving innovation for every other sector. The industry's approximately 10,000 firms produce more than 70,000 products, accounting for more than $800 billion in revenue and touching 96 percent of all manufactured products. The industry spans companies from the development of new plastics and injection molding to the development of green polymers to protect the environment, medical devices and pharmaceuticals.

Why did the US government create the research credit?
From a financial perspective, research and development is a risky undertaking for businesses. A newly developed product may become tremendously successful and become a great source of revenue. Similarly a newly developed production process or an improvement to existing process may significantly reduce costs, enhance product quality, increase yield, and enhance product safety and again result in increased cash flow. However, R&D efforts oftentimes fail, generating no immediate return. In these situations, companies might be reluctant to commit resources towards risky research undertakings. By enacting the research credit in 1981, making the research credit permanent in the PATH Act of 2015, and keeping it permanent in the Tax Cuts and Jobs Act of 2017, Washington concluded that technological advancements and innovations are critically important to the sustainability and success of the entire US economy. Furthermore, for the past four decades, the world has become a global competitive marketplace causing many countries to enact their own research and development tax credit regimes attempting to attract R&D to their shores. Innovation has long been considered a cornerstone of growth for the industry, with yearly spending of more than $55 billion over the past five years leading to new products and processes to meet market requirements and demands, according to the American Chemistry Council (ACC). The role of innovation has evolved, in applying enhanced functionality, customizing products or adapting products to new market opportunities where enhancements provide better reliability, quality or functionality.

The chemicals industry has gone through a tremendous period of change that will help define opportunities and challenges in both the short and the long term. This includes the nature and role of chemical innovation continuing to move away from the blockbuster breakthroughs that characterized the late 20th century, and toward incremental advances targeted at new solutions for targeted specific problems and challenges, e.g. developing new formulations that eliminate formaldehyde as a preservative in well-established products. Another example would be chemists and computer scientists working together to make quantum computers workable devices for studying and understanding chemical systems. Chemists continually increase the complexity of simulations with the hope of utilizing quantum computing in a myriad of applications including catalysis, material science and drug development. Or using graphene, the carbon allotrope transitioning from being a semi-metallic material to a semiconducting one that is useful for a huge range of applications when it is full of perforations. Scientists have developed chemical synthesis to make graphene with nanoscale holes in specific locations, and incorporated the material into functional transistors.

R&D is a critical differentiating competitive factor for the survival of chemical developers. These companies are constantly working to create new or improved products and improve the functionality, performance, reliability or quality of their products. Accomplishing these objectives is technically challenging and expensive.

CHEMICAL R&D CHALLENGES

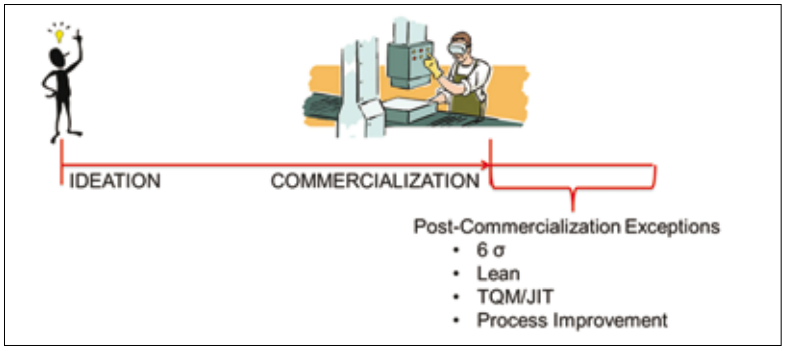
Companies within the chemical industry frequently encounter issues related to the sourcing of raw materials and other inputs, supply chain management, compliance

with safety and regulatory standards, product yield from chemical reactions, product purity, and scalability while striving to keep pricing competitive to maintain and increase market share. Issues also exist with companies failing to integrate recent innovation techniques from other related industries, such as agile methodologies for example. Addressing and overcoming these issues and other scientific technical uncertainties is critical to the success of the business.

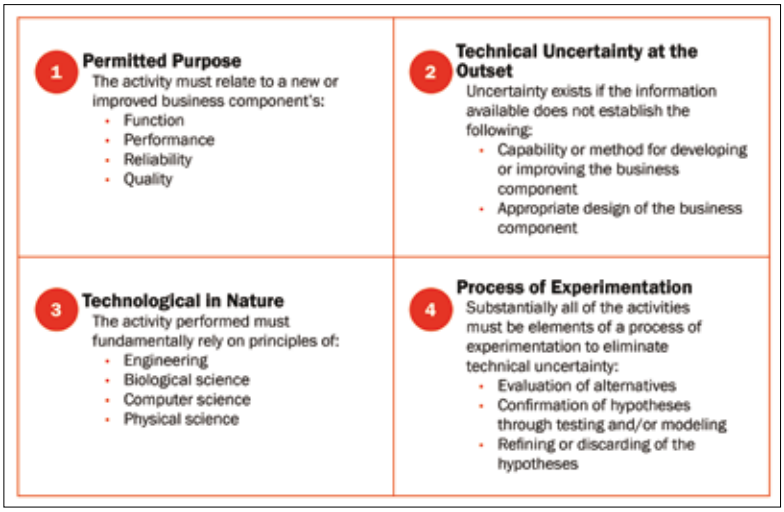
Due to the constantly rising cost of raw materials and the need for competitive pricing in a global economy, supply chain management has become increasingly important for chemical companies. This includes the use of electronic procurement, lean manufacturing, and just-in-time inventory systems. Increasingly, companies within the chemicals industry are focusing their efforts on Six Sigma and Kaizen in order to optimize their manufacturing processes and methods. Identifying better and cheaper raw materials and managing the use of other inputs such as fuel and utilities are extremely important for all companies in the industry in order to remain competitive.

Issues related to product yield and purity, and the identification of catalysts and inhibitors, are uncertainties frequently encountered in the development of new or improved products. Another ubiquitous technical challenge is scalability. As a system increases in pilot plant scale, many properties related to the system size change, such as the proportion of surface area to mass, which cause disruptions in laminar and turbulent flow regimes. In turn reaction kinetics, fluid mechanics and thermodynamics change in a nonlinear fashion, affecting each other as they change. A productive process at lab scale may not produce the same results in larger scale.

These efforts are often time consuming and expensive. However, overcoming such uncertainties is necessary for companies attempting to develop new products and improve upon existing products. Fortunately, the federal government as well as certain state and local governments provide economic incentives to alleviate the financial burden of addressing and overcoming such technical uncertainties. The R&D tax credit lowers the effective cost of performing qualified research. Furthermore, success is not a requirement for claiming expenses as R&D.



Alternative Simplified Credit (ASC)	ASC = (Current Year QRE – (Average of Previous Three Years' QRE × 50 percent)) × 14 percent.
Regular (Traditional) Credit Method	Regular = 20 percent of the smaller of ((Current QRE – Base Period Amount) or (50 percent of Current QRE)) + 20 percent (Current Payments to Universities – Base Period Amount).
Regular (Traditional) Credit Method—Base Period Amount.	(Traditional) Credit Method—Base Period Amount. Base Period Amount = Fixed Base Percentage × Average of the Prior Four Years' Gross Receipts.
If the special election is made under I.R.C. Section 280C(c)(3) the amount of the allowable credit is determined as follows:	
Reduced Credit (ASC Method)	ASC = (Current Year QRE – (Average of Previous Three Years' QRE × 50 percent)) × 9.1 percent.
Reduced Credit (Regular Method)	Regular = 13 percent of the smaller of ((Current QRE – Base Period Amount) or (50 percent of Current QRE)) + 13 percent (Current Payments to Universities – Base Period Amount).



WHAT IS THE R&D TAX CREDIT?

The R&D tax credit is available to any businesses regardless of size or industry that attempt to develop new, improved or technologically advanced products, processes, principles, methodologies or materials. In addition to ''revolutionary'' activities, in some cases, the credit may be available if the company has performed ''evolutionary'' activities such as investing time, money and resources toward improving its products and processes. Improvements must enhance functionality, performance, reliability or quality – they cannot be entirely aesthetic.

Specific activities that are examples of qualifying research activities in the chemicals industry include developing new or improved compounds or other chemical products; developing unique packaging and conducting batch trials, regardless of success or failure; experimentation with scale-up processes; modification of product formulations

Qualified Employee W-2 Wages	• Who Qualifies?
	  ◦ One step up and one step down from project experimentation
	• ***Supervision*** of R&D
	  ◦ Department heads, strategists
	• ***Direct*** R&D = Project Experimentation
	  ◦ Engineers, software developers, scientists, most technical personnel
	• ***Support*** of R&D
	  ◦ Data gathering, report writing / analysis, testing, determination of specs & requirements, QA, some equipment maintenance / improvements

Qualified R&D Supply Expense	• Includes
	  ◦ Materials consumed in experimentation for NPD
	  ◦ Materials used for building product prototypes
	  ◦ Materials used for generating samples during NPD
	  ◦ Materials consumed in trial runs / failed batch trials
	  ◦ Waste, scrap, spoilage from manufacturing
	• Excludes
	  ◦ Capitalized equipment
	  ◦ Overhead (electricity, heat, insurance, etc.)

Qualified R&D Contract Research Expense*
**Allowed at 65% of expense*
**Allowed at 75% for expenses paid to qualified research consortia (primarily non-profits and universities)*
	• Outside consultants/vendors hired on behalf of the taxpayer
	  ◦ Research or development activities must take place in the US
	  ◦ Activities must qualify per IRC Section 41
	  ◦ Taxpayer must be liable for payment regardless of outcome
	  ◦ Taxpayer must retain substantial rights to research results

or production techniques and processes to increase yields, reduce waste, improve product performance or make other improvements to the efficiency of the manufacturing operation; injection molding and developing new tooling; and development of green polymers.
Additional examples of qualifying activities include:

- design and development of new products—particularly products that are safer, more effective or have increased functionality, better performance or longer shelf life;
- research of new applications for existing products;
- design, development and implementation of new reagents, testing methods or protocols;
- product experimentation and modification to increase yield or decrease reaction times;
- improvement of manufacturing or production technologies, processes, techniques or procedures to increase yield, reduce waste and byproducts, improve safety, improve energy efficiency or comply with regulatory requirements;
- development of prototype pilot batches of new product candidates for testing and validation;
- integration of automated processes or robotics intended to increase assembly, manufacturing or production efficiencies.

Examples of activities that would not qualify for purposes of the R&D credit include:

- routine testing or inspection activities for quality control;
- development related purely to aesthetic properties of a product or packaging;
- testing and qualification of production lines;
- production line modifications which don't involve technical uncertainty, i.e. trouble shooting involving detecting faults in production equipment or processes;
- routine data collections;
- research conducted outside the U.S., Puerto Rico or any possession of the U.S.;
- research funded by a third party other than the taxpayer.

What expense categories can be included when calculating the R&D tax credit?
There are three primary types of Qualifying Research Expenses (QREs) that can qualify for the R&D tax credit including: 1) amounts paid to employees as salaries, 2) amounts paid for experimental supplies, and 3) amounts paid to third parties for contract research (research performed on behalf of the taxpayer). Salaries paid to employees who conduct qualified activities are generally the largest component in almost every R&D tax credit claim. Qualifying employees include not only the scientists and engineers actually performing experimental activities, but also employees directly supporting or directly supervising the scientists and engineers. In the chemical industry, consumable supplies used in R&D can amount to very significant QREs, as a great deal of resources are allocated to developing a product and/or process and then scaling up. Contract research can also prove to be a substantial bucket of expenditures as any outside testing and validation costs (including analytical chemistry) may qualify for the R&D tax credit.

CONCLUSION

A wide variety of Chemical companies can lower the cost and risk of R&D expenses by utilizing the aforementioned federal R&D tax credit. Businesses that have so far not taken advantage of this powerful incentive have possibly missed a huge opportunity for improved financial performance. These companies should give the R&D tax credit serious consideration or risk falling behind competition that is astutely claiming its qualified expenses. Now that the R&D tax credit is a permanent part of the US tax code for the foreseeable future qualifying companies would be wise to put mechanisms in place that ensure they are capturing all of the expenses to which they are entitled.
While this may require some time and effort, it is a rare investment that is guaranteed to pay off quickly. Even companies currently operating at a loss should probably look at claiming the credit to which they are entitled because federal R&D tax credits generated but not used can be carried back one year and can be carried forward for up to 20 years, creating a valuable asset if the company does become profitable. And, if a company is acquired, its credits can be considered a valuable asset when negotiating a final selling price for the business. ■

ABOUT THE AUTHOR

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