



**Black Belt Certification Recommendation**

Name \_\_\_\_\_ (as it will appear on the certificate)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_, Zip \_\_\_\_\_

Social Security Number \_\_\_\_\_

We the undersigned, on behalf of \_\_\_\_\_, the Sponsoring Organization, certify the above named individual as a Six Sigma Black Belt within our organization. We further attest that he or she has met the requirements specified by the International Quality Federation (IQF) and recommend that the IQF recognize him or her as an IQF Certified Black Belt.

Printed or typed Board member name	Signature	Date Signed

# **IQF Black Belt Skill Set Certification Process**

## ***Introduction***

This document describes the process and provides the minimum acceptable criteria for certifying an individual as an IQF Six Sigma Black Belt. IQF certification involves recognition by the IQF Six Sigma Black Belt's Sponsoring Organization and his or her peers, and should not be construed as a professional license.

## ***Process***

The IQF and the candidate's Sponsoring Organization determine recognition as an IQF Six Sigma Black Belt jointly. The respective roles are:

### ***IQF***

IQF certification requires that the applicant pass the IQF Black Belt Exam. The examination covers the core skill set of the Black Belt Body of Knowledge (BOK) as defined by the IQF. The IQF will score the candidate and determine if their score meets the IQF's minimum passing score for each section of the BOK, as well as for the overall score.

The IQF also provides the Sponsoring Organization with criteria for assessing the candidate's effectiveness by evaluating his...

- Ability to achieve significant, tangible results by applying the six sigma approach
- Ability to lead organizational change as demonstrated by the candidate's leadership, teamwork, project management, and communication skills.

### ***Sponsoring Organization***

The exam is to be administered by the applicant's Sponsoring Organization and proctored by an agent of the Sponsoring Organization. The Sponsoring Organization is responsible for assuring the integrity of the exam, verifying the identity of the candidate sitting for the exam, and enforcing time limits.

The Sponsoring Organization will evaluate the candidate's effectiveness using the IQF requirements and will notify the IQF when a candidate who has passed the IQF BOK exam has met the effectiveness requirements.

Sponsoring Organizations need not be the candidate's employer. Accredited colleges or universities may serve as a candidate's sponsor. However, the candidate must complete at least two successful major projects applying the six sigma approach to significant production or service processes.

## ***Co-certification***

Candidates who pass the IQF exam and meet IQF effectiveness requirements will be co-certified by the IQF and the Sponsoring Organization as an IQF Six Sigma Black Belt.

## **IQF Black Belt Effectiveness Certification Criteria**

This section describes the criteria for certifying that an IQF Black Belt candidate is "effective" in applying the Six Sigma approach. Effectiveness means that the candidate has demonstrated the ability to lead the change process in an organization by successfully applying six sigma methodologies on more

than one significant project. Success is demonstrated by achieving documented substantial, sustained, and tangible results. Examples of results are cost savings or cost avoidance validated by finance and accounting experts, improved customer satisfaction, reduced cycle time, increased revenues and profits, reduced accident rates, improved morale, reduction of critical to customer defects, etc. Merely demonstrating the use of six sigma tools is **not** sufficient. Nor is the delivery of intermediate “products” such as Pareto diagrams or process maps.

In addition to passing the IQF BOK exam, certification requires the following:

1. Acceptable completion of a black belt training curriculum approved by the Sponsoring Organization.
2. Demonstration of clear and rational thought process.
  - a. Ability to analyze a problem following a logical sequence,
  - b. Usage of facts and data to guide decisions and action.
3. Be able to clearly explain Six Sigma and the DMAIC project cycle in layman’s terms.
4. Ability to achieve tangible results, e.g.,
  - a. Completed two or more projects which employed the Six Sigma approach (DMAIC or equivalent).
    - i. Projects reviewed by appropriate personnel.
    - ii. Deliverables accepted by the project sponsor.
    - iii. Projects documented in the manner prescribed by the Sponsoring Organization.
    - iv. Projects used the Six Sigma approach and correctly employed a significant subset of basic, intermediate, and advanced Six Sigma tools and techniques (see appendix for a listing.)
  - b. Ability to perform benefit/cost analysis,
  - c. Ability to quantify deliverables in terms meaningful to the organization, e.g., cost, quality, cycle time, safety improvement, etc.
  - d. Ability to identify and overcome obstacles to progress,
  - e. Ability to work within time, budget, and operational constraints.
5. Demonstrated ability to explain the tools of Six Sigma to others.
6. Demonstrate interpersonal and leadership skills necessary to be an effective change agent within the organization.

## **IQF Black Belt Certification Board**

The IQF recommends that each area of effectiveness be rated by at least two qualified individuals. The table below provides guidelines for identifying members of the IQF Black Belt Certification Board.

Table 1: IQF Black Belt Certification Board Member Selection Guide

<b>Assessment Subject Area</b>	<b>Board Member</b>
Change agent skills	Supervisor, project sponsor(s), Six Sigma champion, mentor, process owner, Green Belt
Application of tools and techniques	Black Belt Instructor, Master Black Belt, IQF Certified Master Black Belt Consultant
Ability to achieve results	Project sponsor, process owner, team members, Green Belt, Six Sigma champion, IQF Certified Master Black Belt consultant

### ***Effectiveness Questionnaire***

The IQF provides questionnaires to assist IQF Certification Board Members with their assessment. It is strongly recommended that the candidate perform a self-assessment using the IQF questionnaire prior to applying for certification. The candidate should provide the Six Sigma champion with a list of potential members of his or her Certification Board.

The effectiveness questionnaire includes a set of assessment questions for each subject area. The results of the questionnaires can be summarized and used as input into the Sponsoring Organization’s certification process. A form for this is provided below. The scoring summary sheet summarizes the evaluator’s scores by category. Worksheet items scored in the top 3 boxes are considered to be acceptable. Particular attention should be directed to any worksheet item scored in the lower 4 boxes. Since there are 10 choices for each item, any score below 5 indicates that the evaluator disagreed with the survey item. Survey items are worded in such a way that evaluators should agree with them for qualified Black Belt candidates. Disagreement indicates an area for improvement. The scores are, of course, not the only input. The IQF Certification Board must also consider any other relevant factors before reaching their decision.

The Scoring Summary and Assessment Worksheets may be reproduced as necessary.

### ***IQF Black Belt Notebook and Oral Review***

IQF Black Belt candidates should provide Certification Board members with written documentation of their on the job applications of the Six Sigma approach. These “notebooks” should include all relevant information, including project charters, demonstrations of tool usage, samples of data used, excerpts of presentations to sponsors or leaders, team member names, project schedules and performance to these schedules, financial and other business results, etc. The notebooks can be distributed to Certification Board members as either soft copies or hard copies, at their discretion.

Even with the best documentation, it is difficult to assess effectiveness properly without providing the candidate the opportunity to present his or her work and respond to questions. Sponsoring Organizations should require that IQF Black Belt candidates deliver an oral presentation to the Certification Board. The oral review will also provide the Certification Board with a first hand demonstration of the candidate’s communication skills.











## ***Assessment Comments***

<b>Assessment Subject Area</b>	<b>Comments</b>
<b>Change agent skills</b>	
<b>Application of tools and techniques</b>	
<b>Ability to achieve results</b>	

**Scoring Summary**

<b>Evaluator</b>	<b>Subject Area</b>	<b>Items scored 4 or less</b>	<b>% In top 3 boxes</b>	<b>Comment</b>
	Change agent skills			
	Application of tools and techniques			
	Ability to achieve results			
	Change agent skills			
	Application of tools and techniques			
	Ability to achieve results			
	Change agent skills			
	Application of tools and techniques			
	Ability to achieve results			
	Change agent skills			
	Application of tools and techniques			
	Ability to achieve results			
	Change agent skills			
	Application of tools and techniques			
	Ability to achieve results			

## Examples of Six Sigma Tools and Analytical Concepts

Basic	Intermediate	Advanced
<ul style="list-style-type: none"> <li>❑ DMAIC</li> <li>❑ SIPOC</li> <li>❑ DPMO</li> <li>❑ Computer skills</li> <li>❑ Scales of measurement</li> <li>❑ Pareto analysis</li> <li>❑ Process mapping, flowcharts</li> <li>❑ Check sheets</li> <li>❑ Cause-and-effect diagrams</li> <li>❑ Scatter plots</li> <li>❑ Run charts</li> <li>❑ Histograms</li> <li>❑ Ogives</li> <li>❑ Descriptive statistics (e.g., mean, standard deviation, skewness)</li> <li>❑ Enumerative vs. analytic statistics</li> <li>❑ Stem-and-leaf, boxplots</li> <li>❑ Basic probability concepts</li> <li>❑ Discrete probability distributions (binomial, Poisson, hypergeometric)</li> <li>❑ Continuous probability distributions (normal, exponential, etc.)</li> <li>❑ 7M tools</li> <li>❑ FMEA</li> <li>❑ Sampling</li> <li>❑ CTx identification</li> </ul>	<ul style="list-style-type: none"> <li>❑ Control charts for measurements</li> <li>❑ Control charts for attributes</li> <li>❑ Process capability</li> <li>❑ Yield analysis (e.g., first pass yield, rolled throughput yield)</li> <li>❑ Measurement error analysis (Gage R&amp;R)</li> <li>❑ Correlation analysis</li> <li>❑ Simple linear regression</li> <li>❑ Chi-square</li> <li>❑ Type I and Type II errors</li> <li>❑ Confidence interval interpretation</li> <li>❑ Hypothesis tests</li> <li>❑ Normality assessment and transformations</li> <li>❑ Z transformations</li> <li>❑ Process sigma calculations</li> </ul>	<ul style="list-style-type: none"> <li>❑ Exponentially weighted moving average control charts</li> <li>❑ Short run SPC</li> <li>❑ Design and analysis of experiments</li> <li>❑ ANOVA, MANOVA and other general linear models</li> <li>❑ Multiple linear regression</li> <li>❑ Basic reliability analysis</li> <li>❑ Design for Six Sigma</li> <li>❑ Simulation and modeling</li> <li>❑ Statistical tolerancing</li> <li>❑ Response surface methods</li> <li>❑ Robust design concepts</li> <li>❑ Design, validation and analysis of customer surveys</li> <li>❑ Logistic regression</li> </ul>