

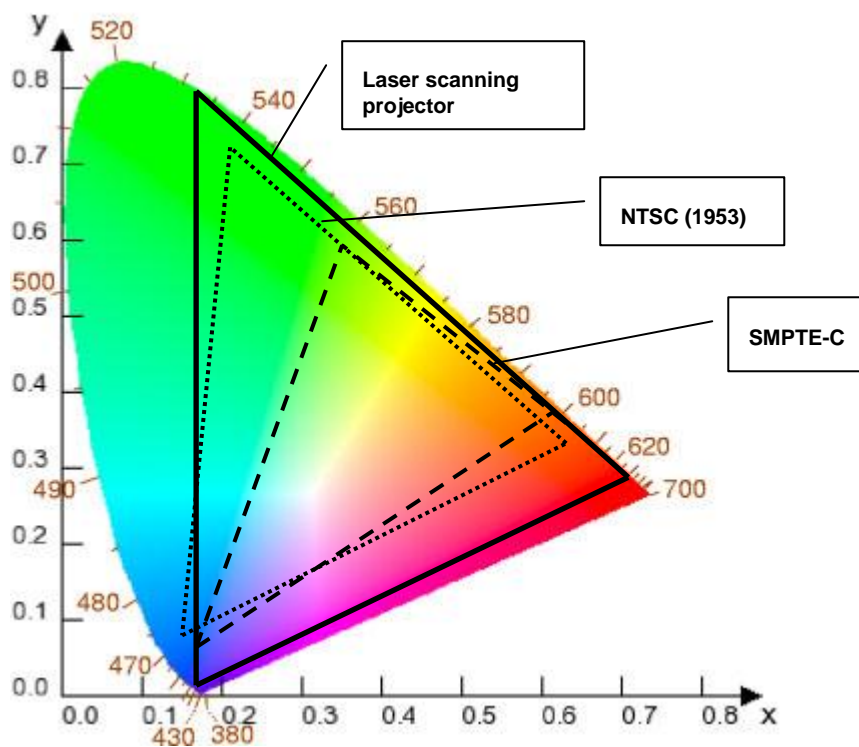
## Color Gamut on Laser Scanning Projectors

### Introduction

Among the other significant quality advantages that laser offers, projection displays based on scanning mirrors and LASER technology provide saturated colors, and bright images. Such projecting applications can benefit from such enhanced imaging-which could generate brilliant, life-size pictures completely filling the spatial acceptance range of the human eye-range. Selecting Lasers of the saturated RGB primary colors enables the coverage of over 90% of the full color gamut and the human eye viewable spectrum.

### Laser color gamut

The Color diagram below presents the available color gamut per of NTSC and SMPTE-C standards and LASER scanning projector.



**Figure 1: Color Gamut Diagram**

Each color in the spectral chart is determined by the spectral response of the RGB-light sensitive receptors of the human eye. The chromaticity diagram represents all the colors that can be produced by mixing colors in the 400-700nm range. The dash line triangle defines the color gamut of SMPTE-C standard, the dotted line triangle defines the color gamut of NTSC (1953) standard and the full triangle defines the color gamut of LASER scanning projectors. Different laser wavelengths will affect the projected colors.

Common  
multimedia  
standards

The original standard for video broadcasting was NTSC, published by the FCC in 1953. Due to technological advances the more commonly adopted standard today is SMPTE-C that was published on 1979.

Standards  
coordinates

		Red	Green	Blue
NTSC	X	0.67	0.21	0.14
	Y	0.33	0.71	0.08
SMPTE-C	X	0.63	0.31	0.155
	Y	0.34	0.595	0.07

Result

Therefore, the color gamut of personal projectors, operated with scanning mirrors, and three RGB Lasers operating at wavelengths of 642, 532 and 445 nm accordingly is 137% of NTSC 1953 and not less than 210% of SMPTE C 1979.

Obviously, by using different lasers, could lead to different results, but as there are currently no other available lasers, adequate for personal micro projection applications, those numbers could serve the industry for quite a while.