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Hydraulic fluid power – Interpolation method for particle count and filter test data

Transmissions hydrauliques – Méthode d'interpolation pour les données issues du comptage des particules et des essais du filtre



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Foreword

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Introduction

The 2016 version of ISO 11171 provides options for reporting particle size in either units of $\mu\text{m}(\text{c})$ or $\mu\text{m}(\text{b})$. While mathematical conversion of $\mu\text{m}(\text{b})$ sizes to $\mu\text{m}(\text{c})$ sizes is straightforward, there is no such universal means for converting particle concentrations or filter Beta Ratios. This is problematic when attempting to comply with contamination control and filter performance specifications given in integral units of $\mu\text{m}(\text{c})$ when data are in integral units of $\mu\text{m}(\text{b})$ corresponding to decimal point $\mu\text{m}(\text{c})$ sizes, or vice versa. For example, particle sizes of 4 $\mu\text{m}(\text{b})$, 6 $\mu\text{m}(\text{b})$, 14 $\mu\text{m}(\text{b})$ and 21 $\mu\text{m}(\text{b})$, correspond to sizes of 3,6 $\mu\text{m}(\text{c})$, 5,4 $\mu\text{m}(\text{c})$, 12,6 $\mu\text{m}(\text{c})$ and 18,9 $\mu\text{m}(\text{c})$, respectively. In the absence of a common interpolation method, otherwise acceptable fluid and filter products can be deemed unacceptable for use because of a discrepancy in the particle sizes reported. This document describes a recommended method for converting $\mu\text{m}(\text{b})$ data to $\mu\text{m}(\text{c})$ data and for interpolating particle concentration, Beta Ratio, and removal efficiency data. The resultant interpolated values can be used to convert cleanliness level or filter performance specifications and data from $\mu\text{m}(\text{b})$ to $\mu\text{m}(\text{c})$.