SIZING AGENTS, STARCH, CARBOXYMETHYL CELLULOSE (CMC), POLYVINYL ALCOHOL (PVA)

Introduction

The yarn sizing process is essential in reducing breakage and thus avoiding stoppages during weaving. Improved quality, as well as smoother surface finish, will be achieved by sizing the strength and abrasion resistance of the yarn. Different types of water soluble polymers known as textiles sizing agents/chemicals are used to protect the yarn. Some examples are modified starch, polyvinyl alcohol (PVA), carboxymethyl cellulose (CMC) and acrylates. Mixtures of the former mediums and other chemical components are also used.

Application

Before the yarn can be woven, it needs to be strengthened to withstand the stress sustained in weaving on a high-speed industrial looms. For this purpose, the yarn is passed through a sizing bath that contains the sizing medium, mixed with water and other additives depending on the formula.

The sizing medium is mixed to achieve the correct level of concentration before loading it into the sizing bath. If starch is used, the mixture has to be cooked before it can be used. Usually the cooking or mixing station is situated close to the sizing bath and may serve several sizing lines.
After the initial mixing, the product is pumped into a product tank. From there, it passes to a final mixing tank, where it is mixed to the required concentration level before loading into the sizing bath. The mixing tanks are equipped with a load gauge so a specific quantity of the medium can be mixed for each textile batch. After the initial mixing and cooking, the concentration of the medium is typically 16-18% and after the final mixing it is at 6-10%. Recycled sizing medium can sometimes be added to the final mixing to adjust the concentration of specific yarns.

Instrumentation and installation

The concentration of the sizing baths need to be monitored as it may fluctuate depending on evaporation and yarn absorption. The K-Patents Process Refractometer PR-43-G is usually mounted in a circulation loop to provide adequate product flow across the prism. Typical concentration levels are 5-15%.

The K-Patents refractometer is also used to measure concentration in the product tanks, or during mixing, to ensure correct concentration levels. A steam cleaning system is recommended for the above installation positions.

### Instrumentation Description

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<th>Description</th>
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<td>K-Patents Process Refractometer PR-43-GP</td>
<td>is a general industrial refractometer for pipes and vessel installations. The PR-43-GP can be installed with 2, 3 and 4 inch flange and 3 inch Sandvik L coupling process connections and a variety of flow cells for pipe sizes of 1 inch and larger.</td>
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<tr>
<td>K-Patents Process Refractometer PR-43-GC</td>
<td>is a compact refractometer for smaller pipe sizes in general industrial applications. Available in 2 inch and 2.5 inch process connections and via reducing ferrule in 1.5 inch process connection. The refractometer is installed directly in a pipe elbow by an L coupling connection or in a straight pipe via a Wafer flow cell or a Pipe flow cell.</td>
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### User Interface

Selectable multichannel MI, compact CI or a web-based WI user interface options allow the user to select the most preferred way to access and use the refractometer measurement and diagnostics data.

### Measurement range

Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100% by weight.