



UNIVERSITY OF TRENTO - Italy

## **Master of Science in Materials and Production Engineering**

# **Melt flow index (MFI), Shore hardness, Vicat/HDT and LOI analysis**

Laboratory activity report  
Course of Polymeric Materials Engineering

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Trento (Italy), jun 2019

Academic year 2018-19

**Abstract**

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## 1 Introduction

## 2 Materials and methods

### 2.1 Sample preparation for compression molding and injection compounding

Two types of Polypropylene (PP) have been poured together in order to obtain a mixture with higher properties with respect to the matrix. For our purpose 15% in weight of flame retardant PP pellet has been added to isotactic PP (PPH-B-10-FB). In Figure 1 is reported the technical datasheet of PPH-B-10-FB. For compression molding a stainless steel plates with a frame of  $12 \times 12 \text{ mm}^2$  has been filled with 34 g of the mixture composed by 27.22 g of isotactic PP and 6.68 g of flame retardant PP. For injection compounding 40 g of the mixture have been weighed. In this case the mixture was composed by 34.01 g of isotactic PP and 5.99 g of flame retardant PP.

Table III-1. Technical datasheet of the isotactic PP (PPH-B-10-FB).

Sample	Test method	Value
MFI (g/10min)	ASTM D1238 (190 °C and 2.16 kg)	12 ± 2
Molecular weight distribution		broad
Density (g/cm <sup>3</sup> )	ASTM 1505	0.904
Atacticity	Xylene solubles	5 % max
Vicat softening point (°C)	ASTM D1525-A (9,81 N)	154
Heat deflection temperature	ASTM D648 (455 kPa)	82
Tensile strength at yield (MPa)	D638 (50 mm/min)	35
Elongation at yield (MPa)	D638 (50 mm/min)	14
Flexural modulus (MPa)	ASTM D790 (1.3 mm/min, 1% secant)	1650 max
Rockwell hardness (R scale)	ASTM D785	111

Figure 1: Technical datasheet of PPH-B-10-FB

### 2.2 Injection molding: sample evaluation

Two groups of specimens have been analyzed to identify specific materials: ISO dumbbell specimens and ASTM dumbbell specimens. For each group several samples have been provided in order to

recognize a specific polymer. In Table 1 is reported the list of polymers recognized.

**Table 1:** Materials used in sample evaluation

ASTM dumbbell	ISO dumbbell
ABS	POM bi-injected
COC	PA11 mono-injected
PP	PP-GF 30 (white) and PP-GF35 (black)
HDPE Eltex yellow	PA6-GF50
PE/PP blend	
PA11	
TPU	