COATINGS

INDORAMA VENTURES

ULTRATINT®

SERIES

Building Blocks to fine-tune coatings performance

COATINGS

Indorama Ventures' alkoxylated polyols were designed to improve physicochemical properties such as adhesion to metal, impact and scratch resistance, Chemical resistance and other features in coatings. Furthermore, it can be added as well to the final coating as to the resin, bringing flexibility to the formulator.

BENEFITS

- Balance of mechanical properties
  - Better substrate and intercoat adhesion
  - Improved flexibility
  - Better hardness profile
- Increased chemical resistance
- Increased corrosion resistance
- The ULTRATINT® line is highly compatible with resins commonly applied in coatings compositions (e.g. polyester, acrylic, etc)
- The ULTRATINT® line is suitable for 2K system compositions (e.g. polyurethane, polyol-melamine, etc)

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FEATURES

- Easy to handle (Viscous liquid)
- 100% solids
- Versatility – suitable for Water-based and solvent-borne
- Package: bulk, drum, sample

Table 1:

TYPICAL VALUES AND PROPERTIES OF BUILDING BLOCKS

PROPERTIES	ULTRATINT® BP 60	ULTRATINT® TM 30
Appearance @ 25 °C	Clear Liquid	Clear Liquid
Viscosity, cP @ 25 °C	2500 – 5000	500 – 1000
Actives, wt%	~ 100	~ 100
Boiling Point, °C	320	300
Hydroxyl Value, mgKOH/g	~ 232	~ 610
Functionality, eqOH/mol	2	3

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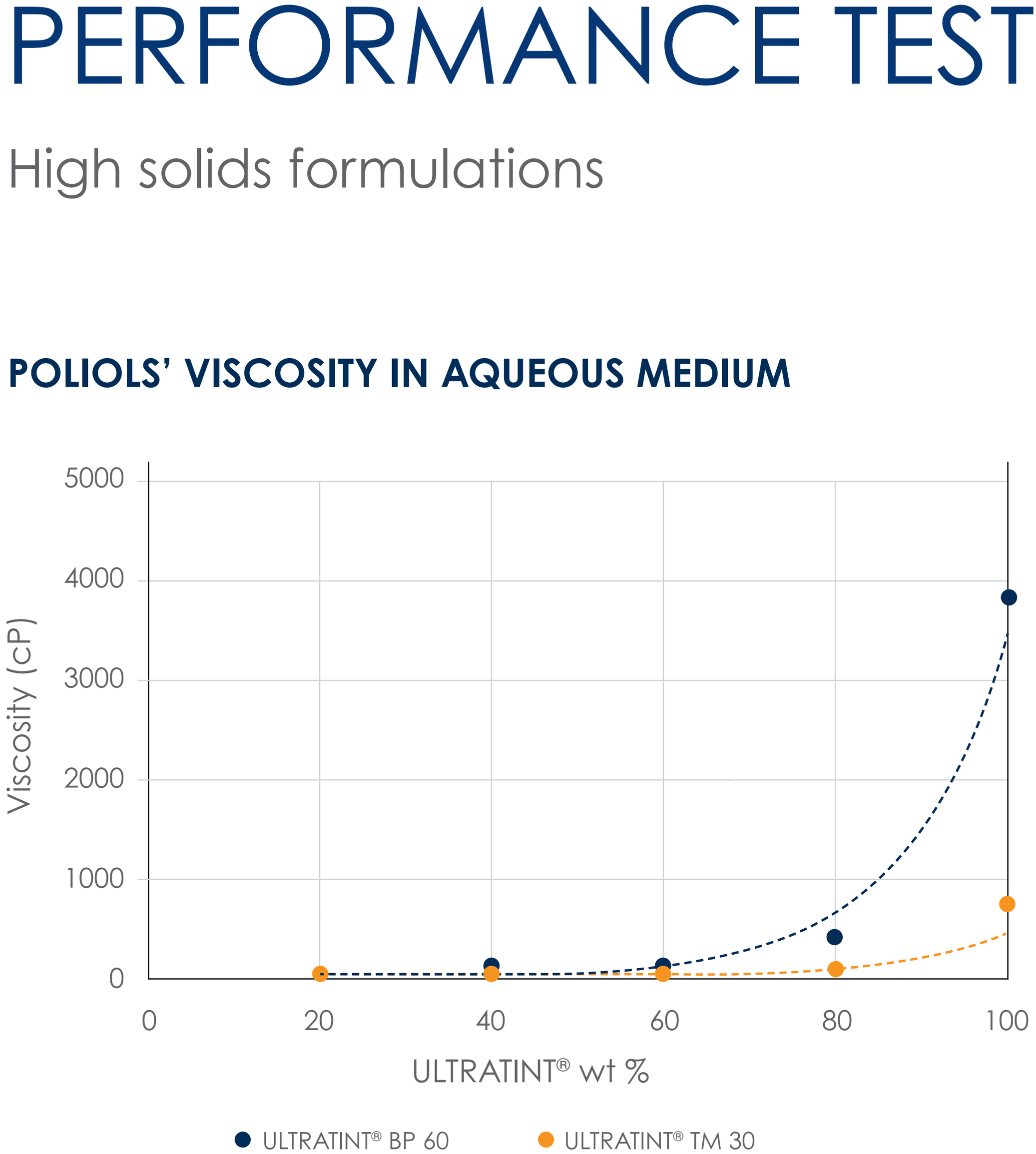
PERFORMANCE TESTS

High solids formulations

POLIOLS' VISCOSITY IN AQUEOUS MEDIUM



ULTRATINT® BP 60 or **ULTRATINT® TM 30** can be added to aqueous medium up to 60 wt% with minimal increase in the viscosity of the system.

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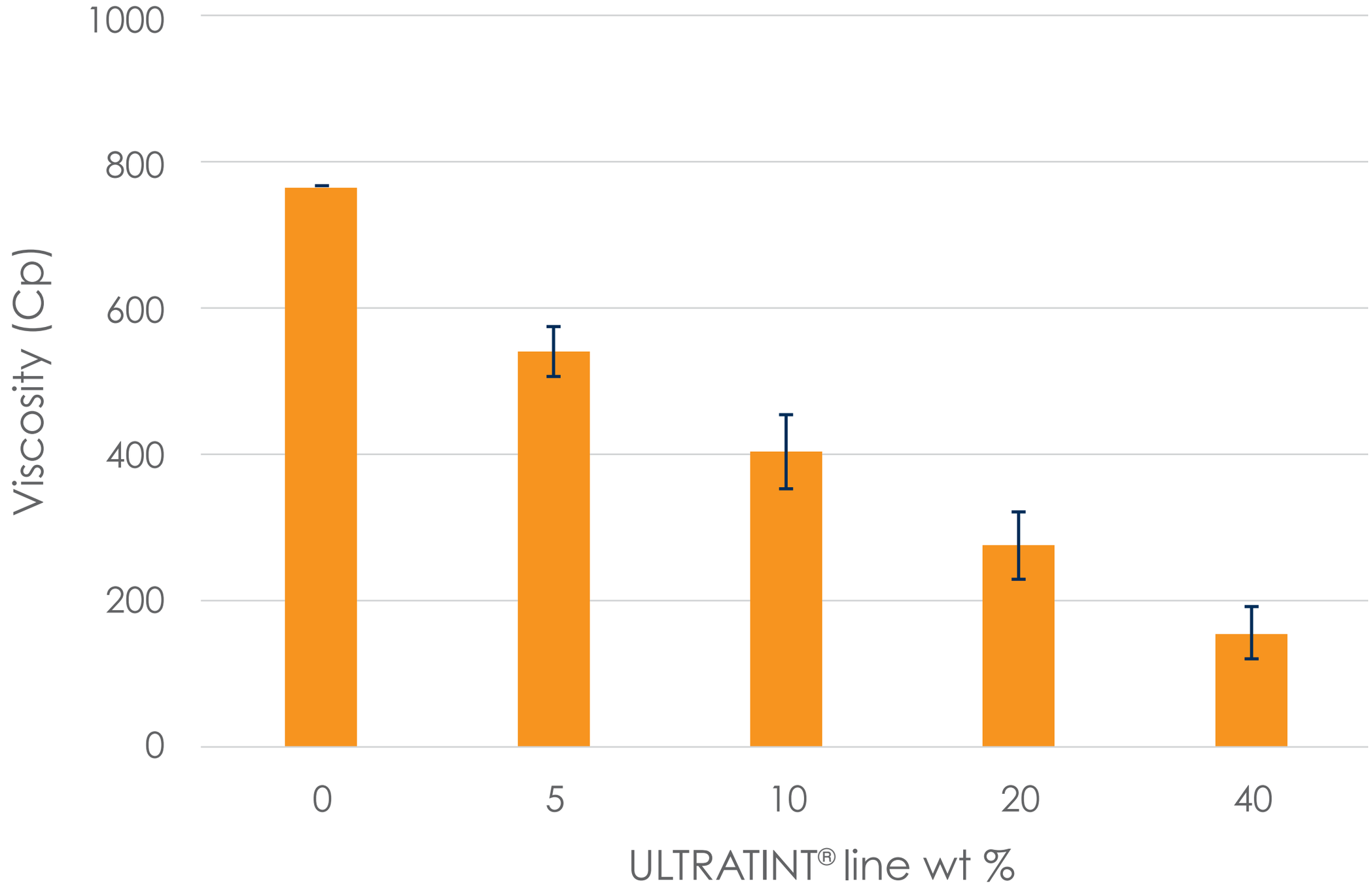
PERFORMANCE TESTS

High solids formulations



Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Methylated melamine (160g/eq). R (Melamine/OH) = 1.0. Average values for ULTRAINT® BP 60 and ULTRAINT® TM 30.

The addition of **ULTRATINT® BP 60** or **ULTRATINT® TM 30** allows high-solid formulations with combined facilities in coatings applications (reduced viscosity).

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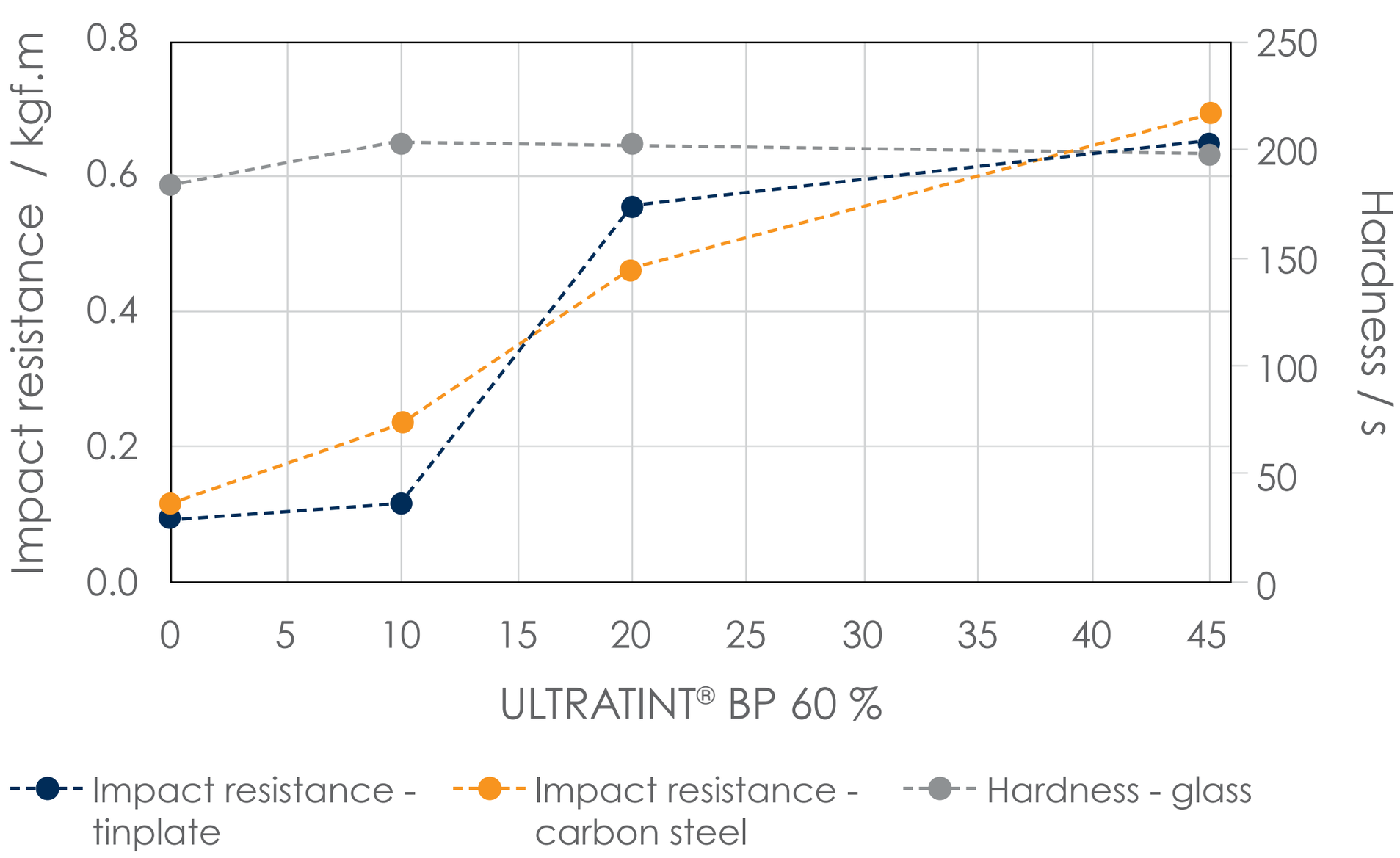
PERFORMANCE TESTS

Balancing Hardness and Impact Resistance ULTRATINT® BP 60

2K SOLVENT BASED VARNISH COMPOSITION



Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Aliphatic Polyisocyanate (NCO = 19.6%). R (NCO/OH) = 1.0. Methods: ASTM D4366 and ASTM D6905.

Coating composition	Substitution of resin by polyol (%)	0	10	20	45
Solids (wt %)	**ULTRATINT® BP 60**	0	6	12	26
	Polyester resin	61	54	48	31
	Curing agent	39	40	41	43

Progressive increase in impact resistance with the progressive substitution of resin by **ULTRATINT® BP 60** without loosing the hardness of the film in tinplate or carbon steel substrates.

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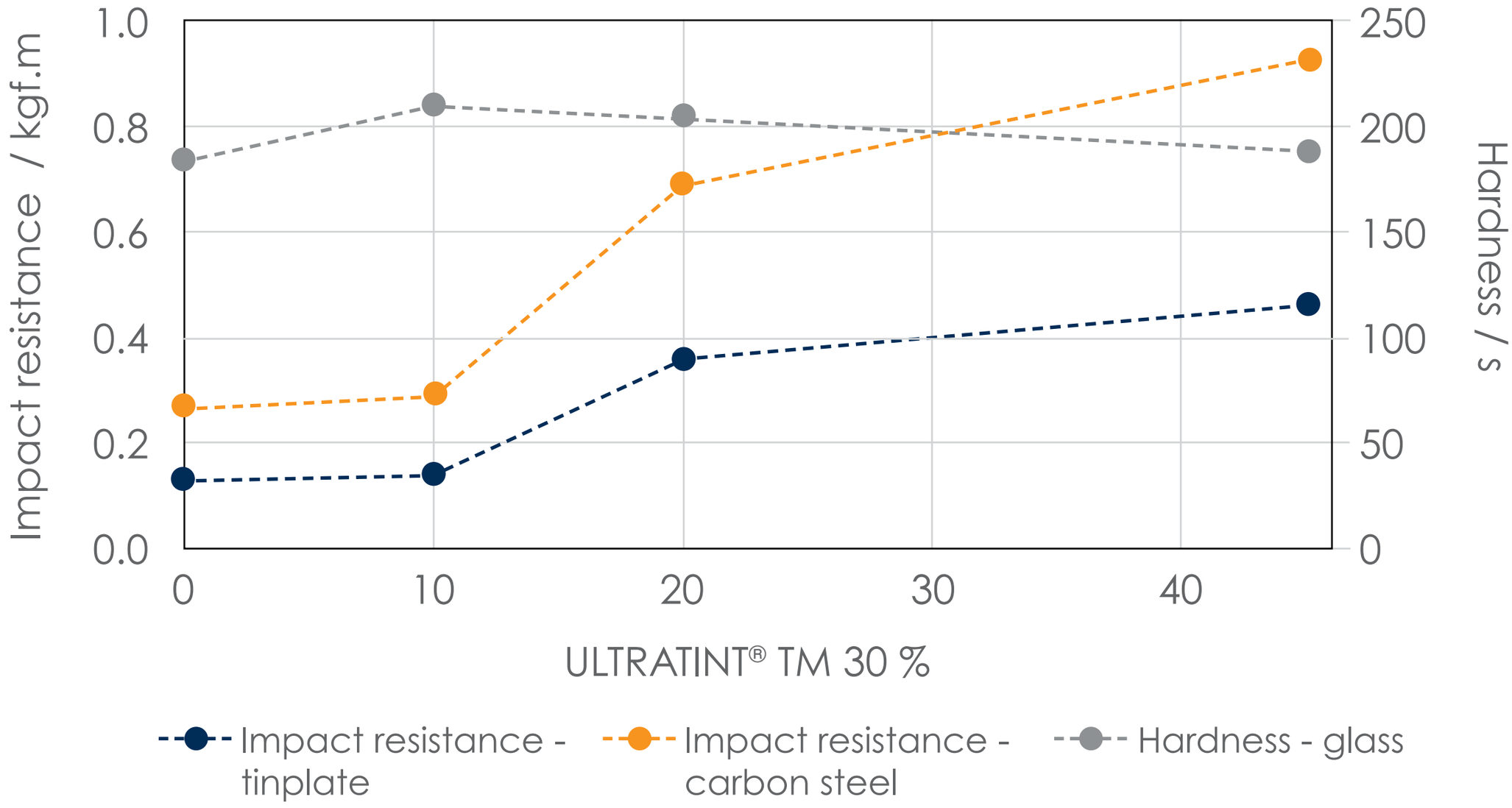
PERFORMANCE TESTS

Balancing Hardness and Impact Resistance ULTRATINT® TM 30

2K SOLVENT BASED VARNISH COMPOSITION



Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Aliphatic Polyisocyanate (NCO = 19.6%). R (NCO/OH) = 1.0. Methods: ASTM D4366 and ASTM D6905.

Coating composition	Substitution of resin by polyol (%)	0	10	20	45
Solids (wt %)	**ULTRATINT® TM 30**	0	6	10	19
	Polyester resin	61	50	41	23
	Curing agent	39	44	49	58

Progressive increase in impact resistance with the progressive substitution of resin by **ULTRATINT® TM 30** without loosing the hardness of the film in tinplate or carbon steel substrates.

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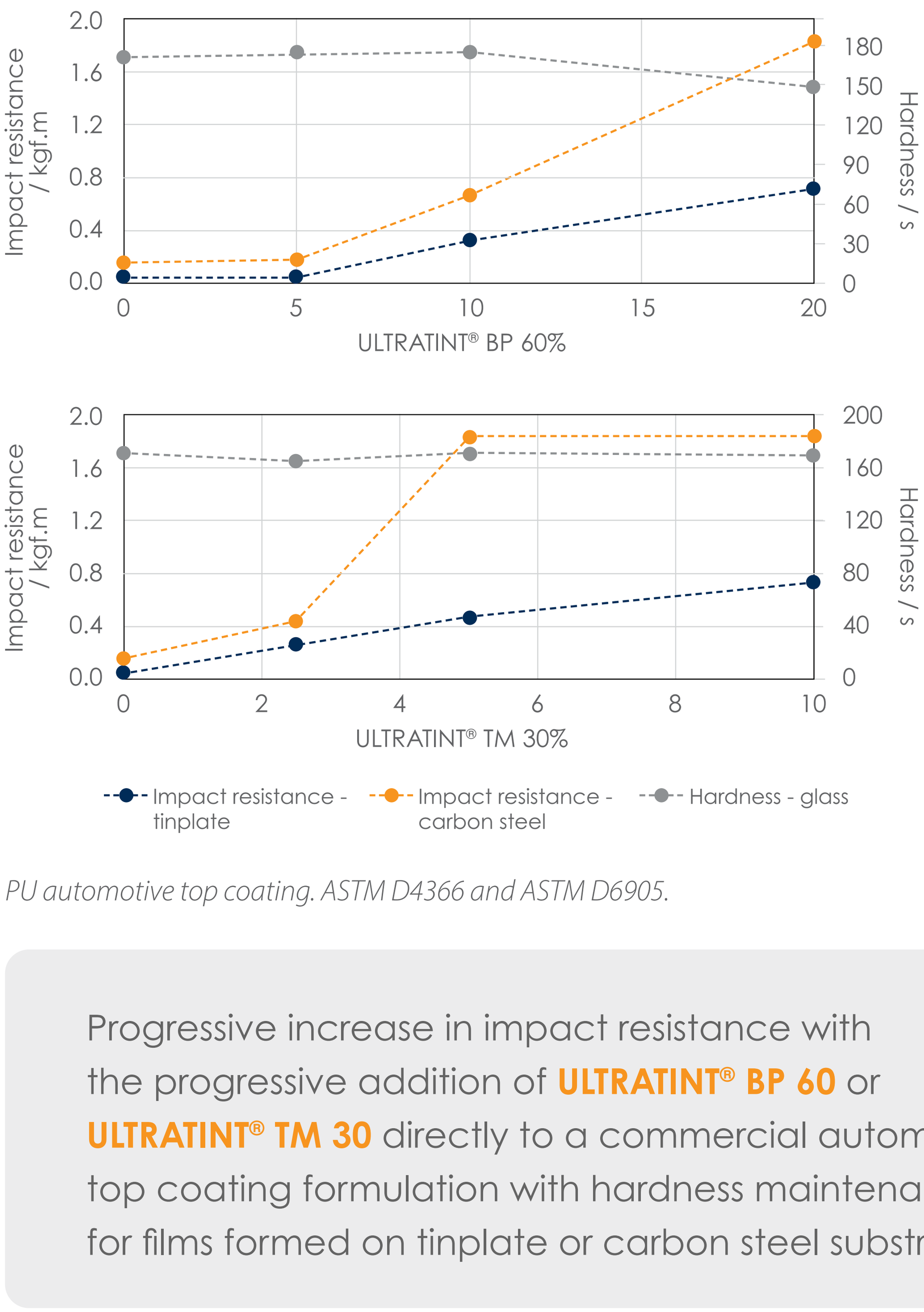
PERFORMANCE TESTS

Balancing Hardness and Impact Resistance ULTRATINT® BP 60 and ULTRATINT® TM 30

AUTOMOTIVE TOP COATING: EXAMPLE IN THE FINAL APPLICATION



PU automotive top coating. ASTM D4366 and ASTM D6905.

Progressive increase in impact resistance with the progressive addition of **ULTRATINT® BP 60** or **ULTRATINT® TM 30** directly to a commercial automotive top coating formulation with hardness maintenance for films formed on tinplate or carbon steel substrates.

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PERFORMANCE TESTS

ADHESION – ULTRATINT® BP 60

	Carbon steel		TINPLATE	
ULTRATINT® BP 60%	**X cut**	**# CUT**	**X CUT**	**# CUT**
0	4	Gr4	4	Gr2
5	2	Gr4	4	Gr2
10	2	Gr1	2	Gr1
20	2	Gr0	2	Gr1

Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Methylated melamine (160g/eq). R (Melamine/OH) = 1.0. ABNT NBR 11003.

Coating composition	**Substitution of resin by polyol (%)**	**0**	**5**	**10**	**20**
Solids (wt %)	**ULTRATINT® BP 60**	0	3	7	13
	Polyester resin	68	64	60	53
	Curing agent	32	33	33	34

The substitution of 20 % of resin by **ULTRATINT® BP 60** improved the adhesion results from worse classifications (X cut X = 4 and # cut Gr4 in carbon steel and X cut X = 4 cut to tinplate) to low or no failure (X = 2 and Gr1 or Gr0).

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PERFORMANCE TESTS

ADHESION – ULTRATINT® TM 30

	Carbon steel	
ULTRATINT® TM 30 %	**X cut**	**# CUT**
0	4	Gr4
5	4	Gr4
10	2	Gr1
20	2	Gr1

Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Methylated melamine (160g/eq). R (Melamine/OH) = 1.0. ABNT NBR 11003.

Coating composition	Substitution of resin by polyol (%)	0	5	10	20
Solids (wt %)	**ULTRATINT® TM 30**	0	3	6	12
	Polyester resin	68	62	56	46
	Curing agent	32	35	38	42

The substitution of 10 % of resin by **ULTRATINT® TM 30** improved the adhesion from worse classifications (X cut X = 4 and # cut Gr4 in carbon steel) to low failure results (X = 2 and Gr1).

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PERFORMANCE TESTS

ADHESION – ULTRATINT® TM 30

	Carbon steel		TINPLATE	
ULTRATINT® TM 30 %	**X CUT**	**# CUT**	**X CUT**	**# CUT**
0	1	Gr1	4	Gr4
2.5	0	Gr1	1	Gr4
5	0	Gr1	1	Gr4

PU automotive top coating. Mixture ratio 4:1. ABNT NBR 11003.

At least 2.5 % of **ULTRATINT® TM 30** added directly to a commercial automotive top coating improved the adhesion results on carbon steel (X cut: from 1 to 0) and tinplate (X cut: from 4 to 0).

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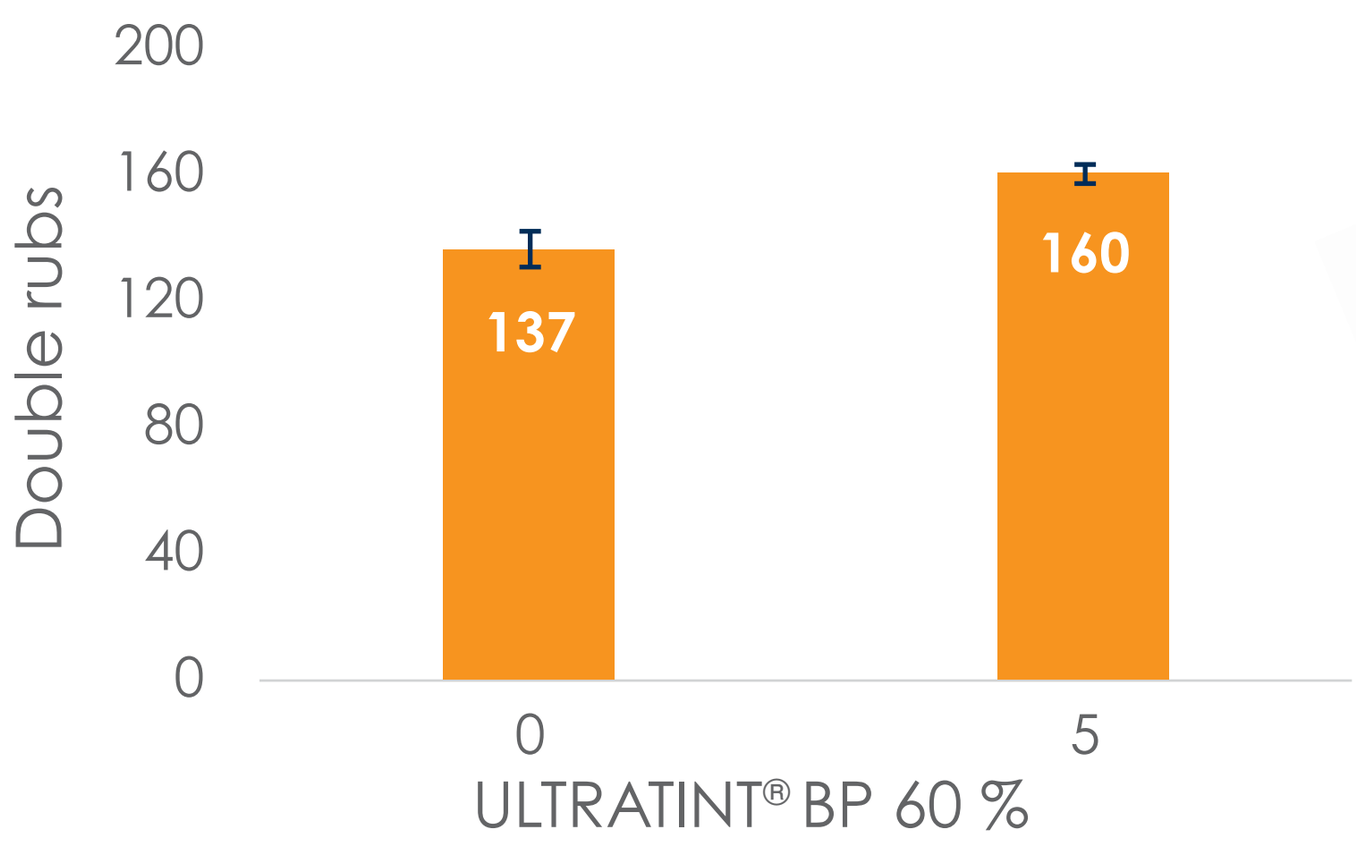
PERFORMANCE TESTS

MEK RESISTANCE - ULTRATINT® BP 60



Acrylic resine (%NV = 50.0 %, IOH = 2.4 %). Curing Agent: Aliphatic Polyisocyanate (NCO = 19.6%). R = 1. Method: ASTM D5402.

Coating composition	SUBSTITUTION OF RESIN BY POLYOL (%)	0	5
Solids (wt %)	ULTRATINT® BP 60	0	4
	Polyester resin	77	71
	Curing agent	23	25

The substitution of 5 % of resin by **ULTRATINT® BP 60** in an acrylic polyurethane system increased the cycles supported until failure in the MEK resistance test.

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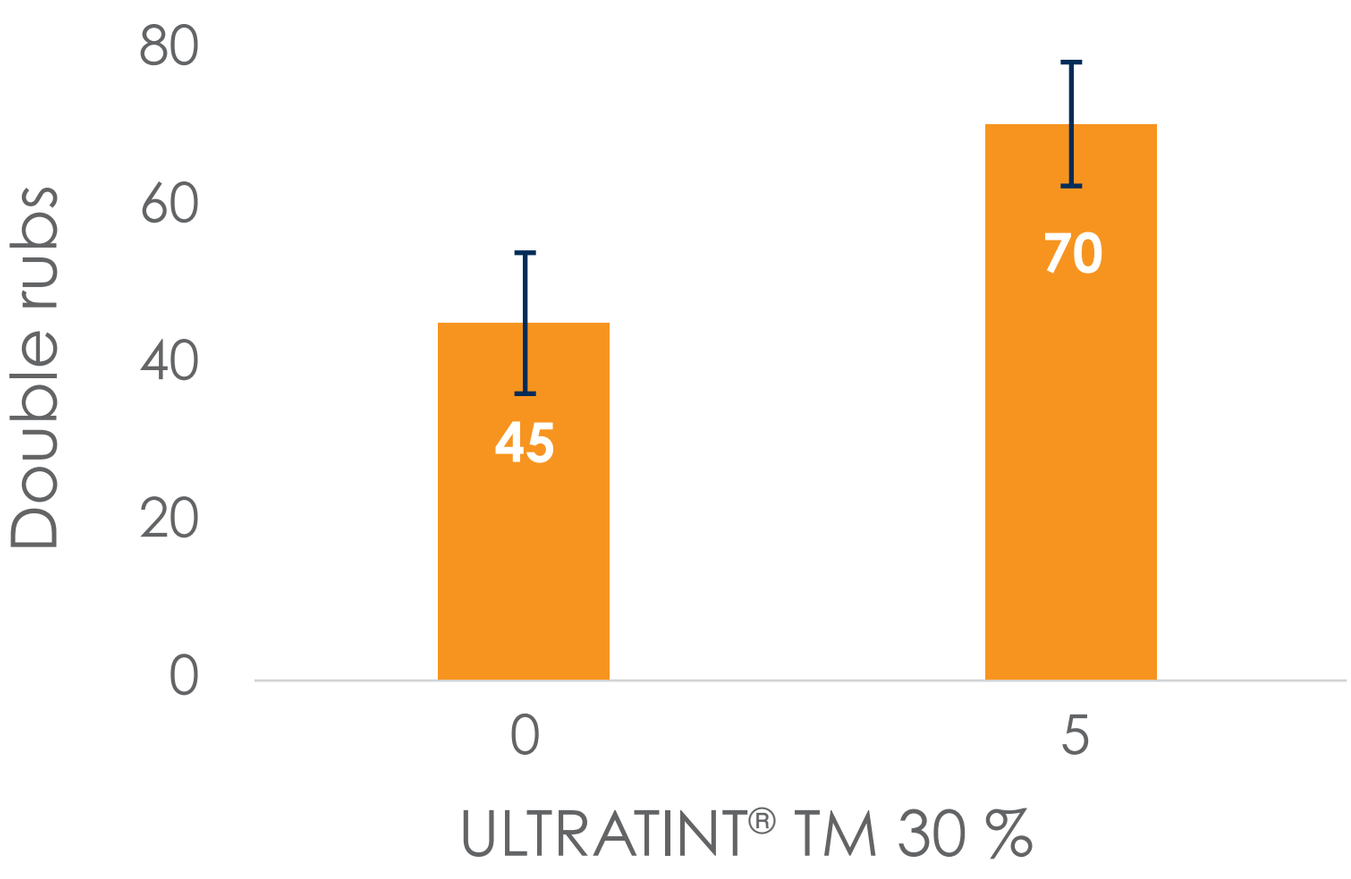
PERFORMANCE TESTS

MEK RESISTANCE - ULTRATINT® TM 30



Polyester resine (%NV = 60.0 %, IOH = 5 %). Curing Agent: Methylated melamine (160g/eq). R (Melamine/OH) = 5.0. Method: ASTM D5402.

Coating composition	SUBSTITUTION OF RESIN BY POLYOL (%)	0	5
Solids (wt %)	ULTRATINT® TM 30	0	3
	Polyester resin	68	62
	Curing agent	32	35

The substitution of 5 % of resin by **ULTRATINT® TM 30** in a polyester melamine system increased the cycles supported until failure in the MEK resistance test.

If you have to fine-tune the performance of your coating **ULTRATINT® SERIES** is what you need! Contact us and request a sample.

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