ARMO Datasheet

Ian Hansen
ARMO Committee Member

2015 ARM Annual Meeting

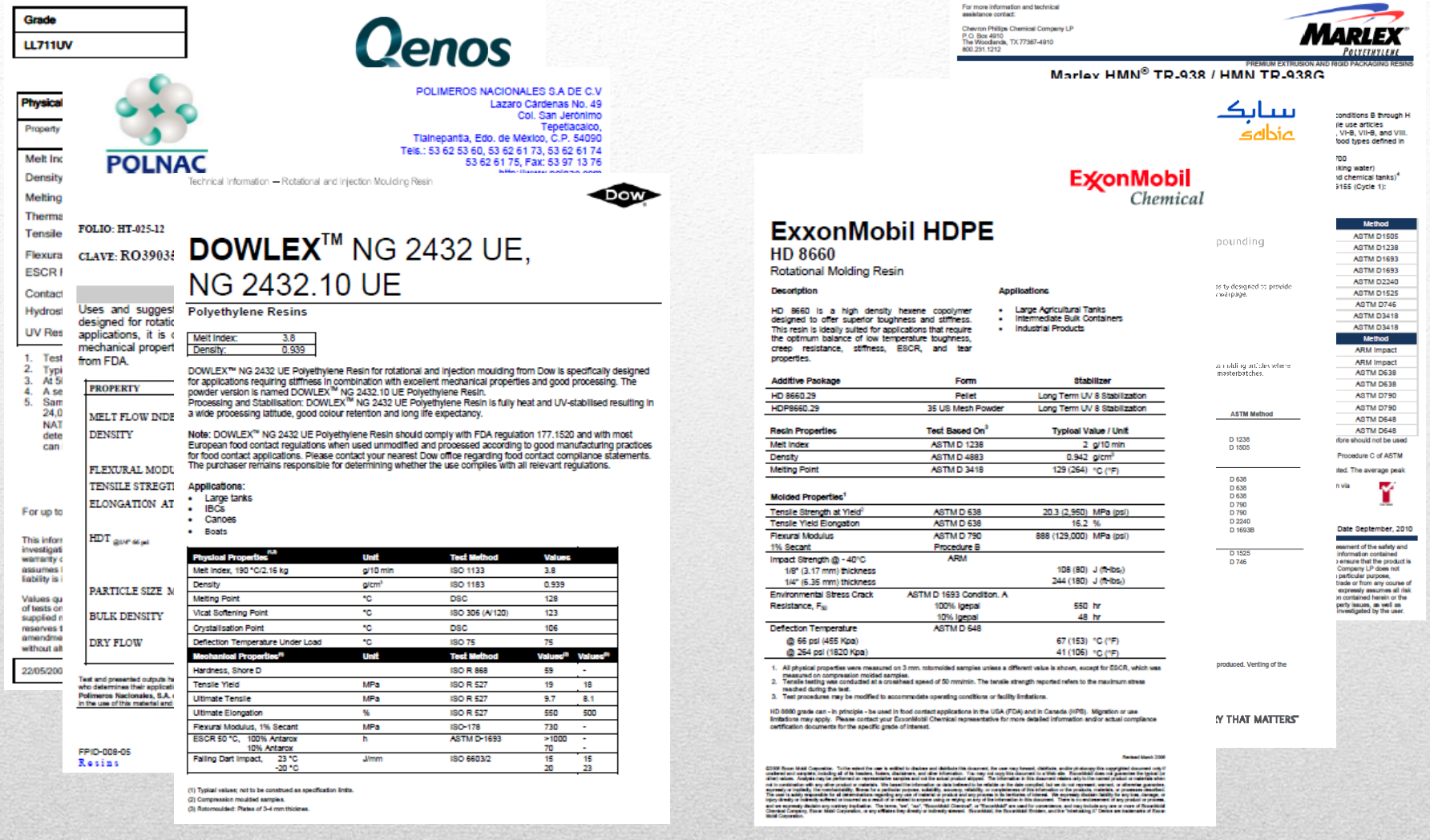
ARMO and ARM

The Affiliation of Rotational Moulding Organisations (ARMO) was established to provide an equal forum for organisations serving the global rotational moulding industry.

ARMO is a voluntary group of organisations servicing the global rotomoulding industry, like ARM, each having their individual memberships and structure.

The vision of ARMO is to work co-operatively on various projects for the benefit of all members.

The worldwide harmonisation of Datasheets is one project presented to the ARMO Board during the Nottingham ARMO conference



Grade
LL711UV

Qenos

POLIMEROS NACIONALES S.A DE C.V
Lazaro Cárdenas No. 49
Col. San Jerónimo
Tepetlacalco,
Tlalnepantla, Edo. de México, C.P. 54090
Tels.: 53 62 53 60, 53 62 61 73, 53 62 61 74
53 62 61 75, Fax: 53 97 13 76

POLNAC

Technical Information — Rotational and Injection Moulding Resin

FOLIO: HT-025-12

CLAVE: RO39035

DOWLEX™ NG 2432 UE, NG 2432.10 UE

Polyethylene Resins

Melt Index:	3.8
Density:	0.939

DOWLEX™ NG 2432 UE Polyethylene Resin for rotational and injection moulding from Dow is specifically designed for applications requiring stiffness in combination with excellent mechanical properties and good processing. The powder version is named DOWLEX™ NG 2432.10 UE Polyethylene Resin.
Processing and Stabilisation: DOWLEX™ NG 2432 UE Polyethylene Resin is fully heat and UV-stabilised resulting in a wide processing latitude, good colour retention and long life expectancy.

Note: DOWLEX™ NG 2432 UE Polyethylene Resin should comply with FDA regulation 177.1520 and with most European food contact regulations when used unmodified and processed according to good manufacturing practices for food contact applications. Please contact your nearest Dow office regarding food contact compliance statements. The purchaser remains responsible for determining whether the use complies with all relevant regulations.

Applications:
- Large tanks
- IBCs
- Canoes
- Boats

Physical Properties[2,3]	Unit	Test Method	Values
Melt Index, 190 °C/2.16 kg	g/10 min	ISO 1133	3.8
Density	g/cm³	ISO 1183	0.939
Melting Point	°C	DSC	128
Vicat Softening Point	°C	ISO 306 (A/120)	123
Crystallisation Point	°C	DSC	106
Deflection Temperature Under Load	°C	ISO 75	75
Mechanical Properties[3]	**Unit**	**Test Method**	**Values[3]**	**Values[3]**
Hardness, Shore D		ISO R 868	59	-
Tensile Yield	MPa	ISO R 527	19	18
Ultimate Tensile	MPa	ISO R 527	9.7	8.1
Ultimate Elongation	%	ISO R 527	550	500
Flexural Modulus, 1% Secant	MPa	ISO-178	730	-
ESCR 50 °C, 100% Antarox	h	ASTM D-1693	>1000	-
10% Antarox			70	-
Failing Dart Impact, 23 °C	J/mm	ISO 6603/2	15	15
-20 °C			20	23

(1) Typical values; not to be construed as specification limits.
(2) Compression moulded samples.
(3) Rotomoulded: Plates of 3-4 mm thickness.

FPID-008-05
Resins

For more information and technical assistance contact:
Chevron Phillips Chemical Company LP
P.O. Box 4910
The Woodlands, TX 77387-4910
800.231.1212

MARLEX POLYETHYLENE
PREMIUM EXTRUSION AND RIGID PACKAGING RESINS

Marlex HMN® TR-938 / HMN TR-938G

sabic

ExxonMobil Chemical

ExxonMobil HDPE

HD 8660

Rotational Molding Resin

Description

HD 8660 is a high density hexene copolymer designed to offer superior toughness and stiffness. This resin is ideally suited for applications that require the optimum balance of low temperature toughness, creep resistance, stiffness, ESCR, and tear properties.

Applications
- Large Agricultural Tanks
- Intermediate Bulk Containers
- Industrial Products

Additive Package	Form	Stabilizer
HD 8660.29	Pellet	Long Term UV 8 Stabilization
HDP8660.29	35 US Mesh Powder	Long Term UV 8 Stabilization

Resin Properties	Test Based On[3]	Typical Value / Unit
Melt Index	ASTM D 1238	2 g/10 min
Density	ASTM D 4883	0.942 g/cm³
Melting Point	ASTM D 3418	129 (264) °C (°F)
Molded Properties[1]		
Tensile Strength at Yield[2]	ASTM D 638	20.3 (2,950) MPa (psi)
Tensile Yield Elongation	ASTM D 638	16.2 %
Flexural Modulus	ASTM D 790	888 (129,000) MPa (psi)
1% Secant	Procedure B	
Impact Strength @ - 40°C	ARM	
1/8" (3.17 mm) thickness		108 (80) J (ft-lbs/)
1/4" (6.35 mm) thickness		244 (180) J (ft-lbs/)
Environmental Stress Crack Resistance, F_{50}	ASTM D 1693 Condition. A	
	100% Igepal	550 hr
	10% Igepal	48 hr
Deflection Temperature	ASTM D 648	
@ 66 psi (455 Kpa)		67 (153) °C (°F)
@ 264 psi (1820 Kpa)		41 (105) °C (°F)

1. All physical properties were measured on 3 mm. rotomolded samples unless a different value is shown, except for ESCR, which was measured on compression molded samples.
2. Tensile testing was conducted at a crosshead speed of 50 mm/min. The tensile strength reported refers to the maximum stress reached during the test.
3. Test procedures may be modified to accommodate operating conditions or facility limitations.

HD 8660 grade can - in principle - be used in food contact applications in the USA (FDA) and in Canada (HPB). Migration or use limitations may apply. Please contact your ExxonMobil Chemical representative for more detailed information and/or actual compliance certification documents for the specific grade of interest.

Revised March 2006

pounding

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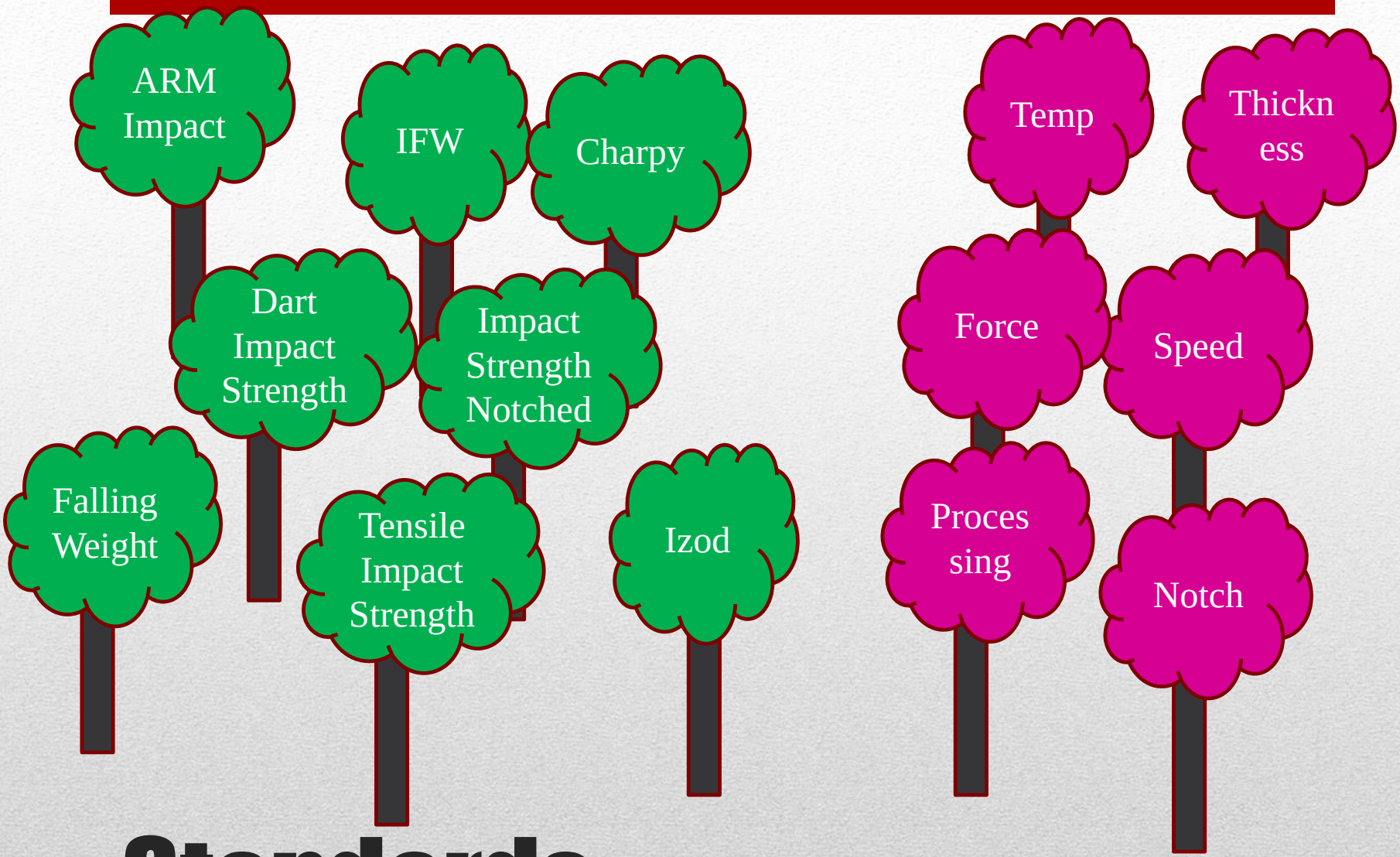
Method
ASTM D1505
ASTM D1238
ASTM D1693
ASTM D1693
ASTM D2240
ASTM D1525
ASTM D746
ASTM D3418
ASTM D3418
Method
ARM Impact
ARM Impact
ASTM D638
ASTM D638
ASTM D790
ASTM D790
ASTM D648
ASTM D648

ASTM Method
D 1238
D 1505
D 638
D 638
D 638
D 790
D 790
D 2240
D 1693B
D 1525
D 746

Date September, 2010

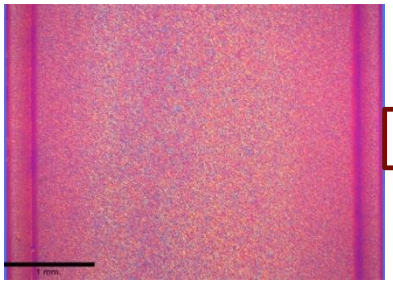
Datasheet Jungle


ARM Impact
IFW
Charpy
Dart Impact Strength
Impact Strength Notched
Falling Weight
Tensile Impact Strength
Izod
Temp
Thickness
Force
Speed
Processing
Notch

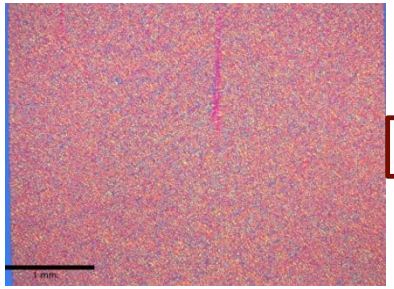
Standards

Processing of Specimen

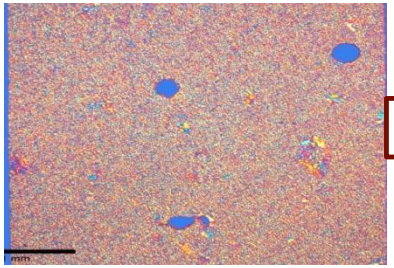
Morphology



Injection Moulding

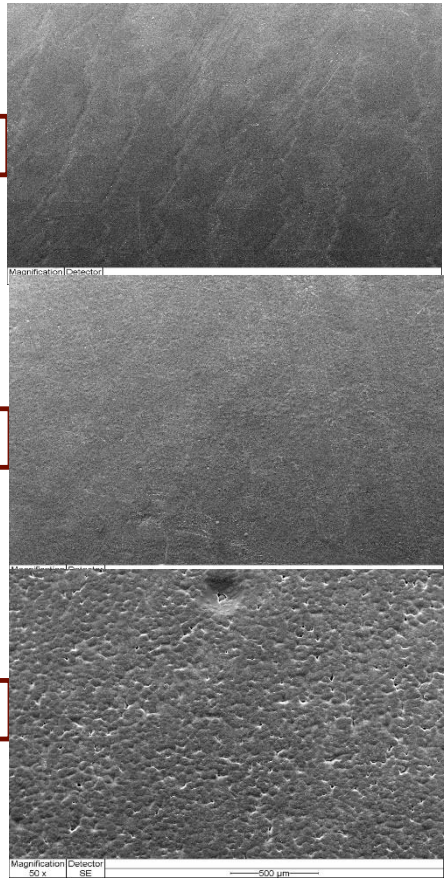


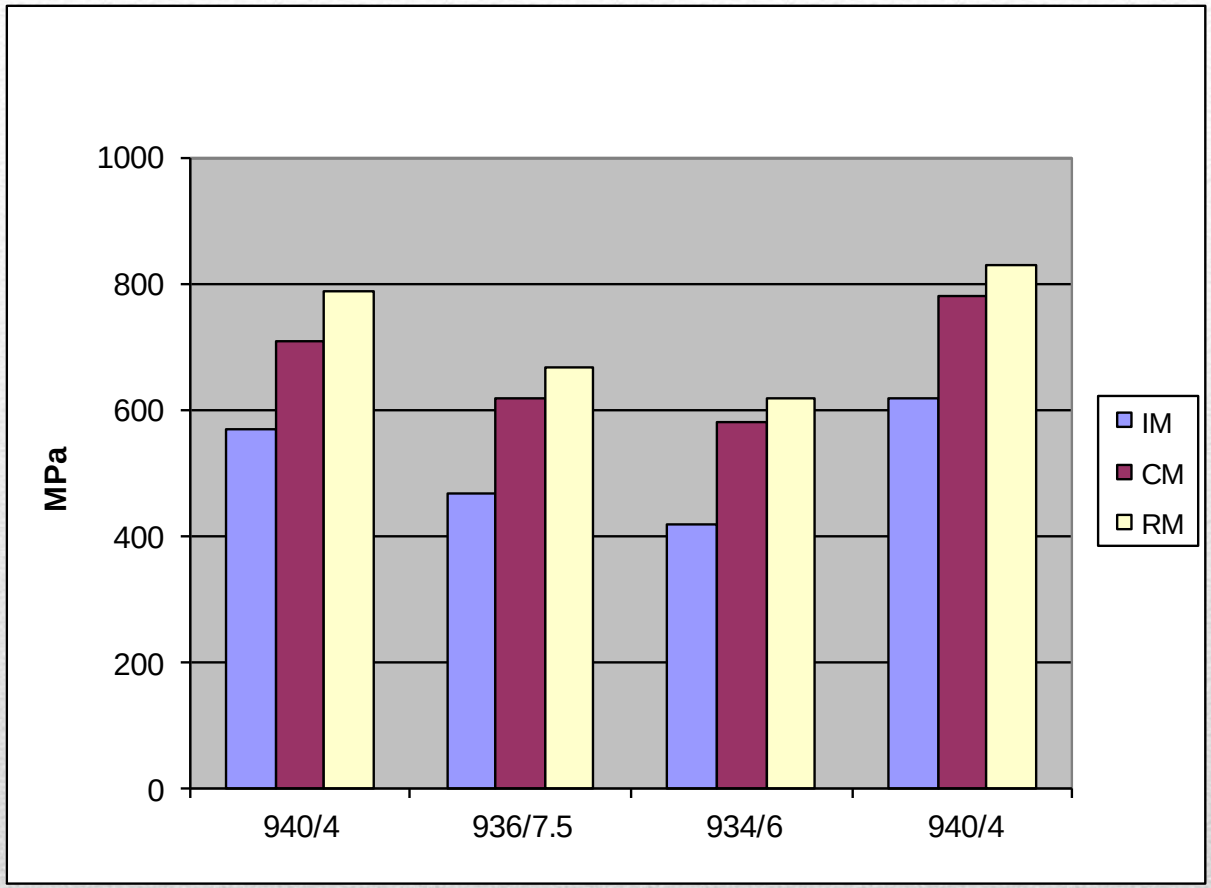
Compression Moulding



Rotational Moulding

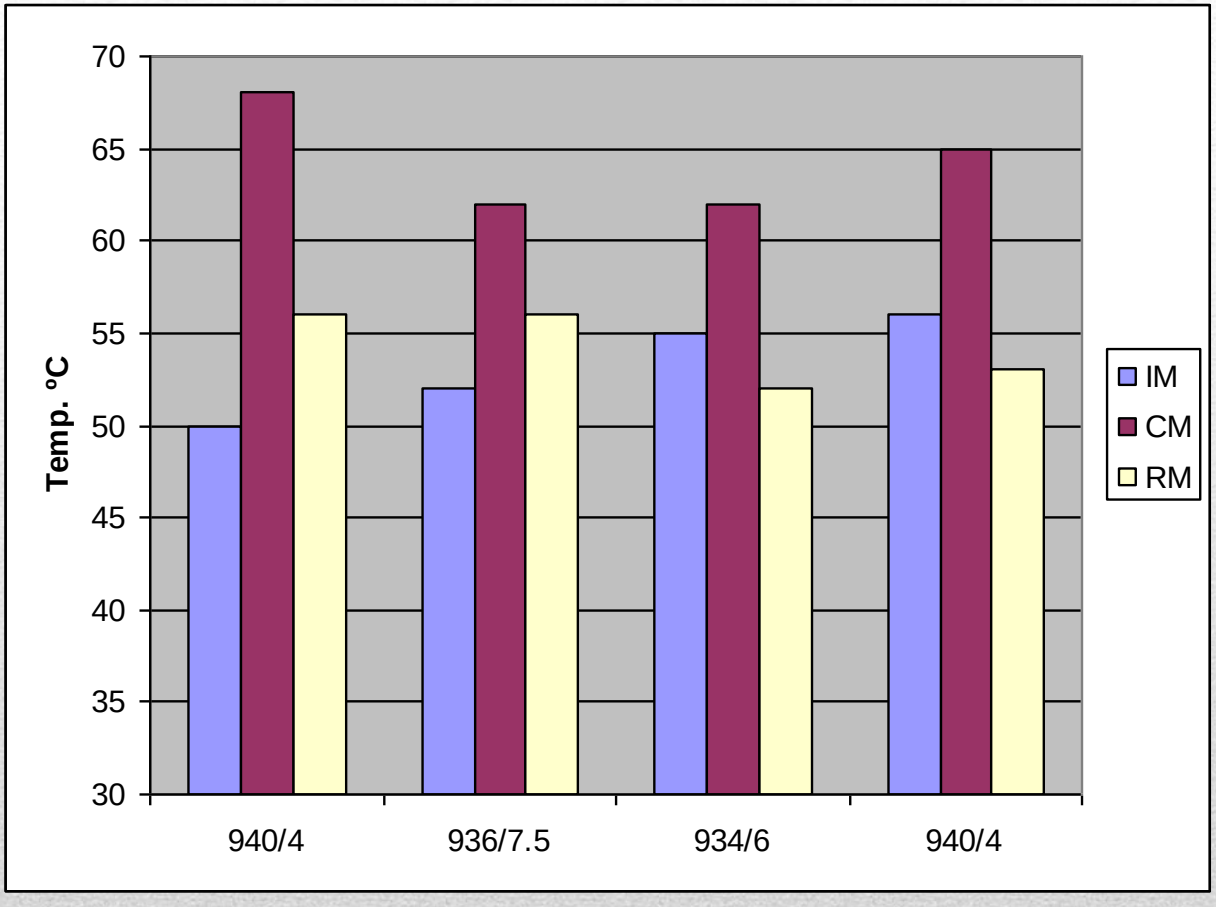
Surface Quality





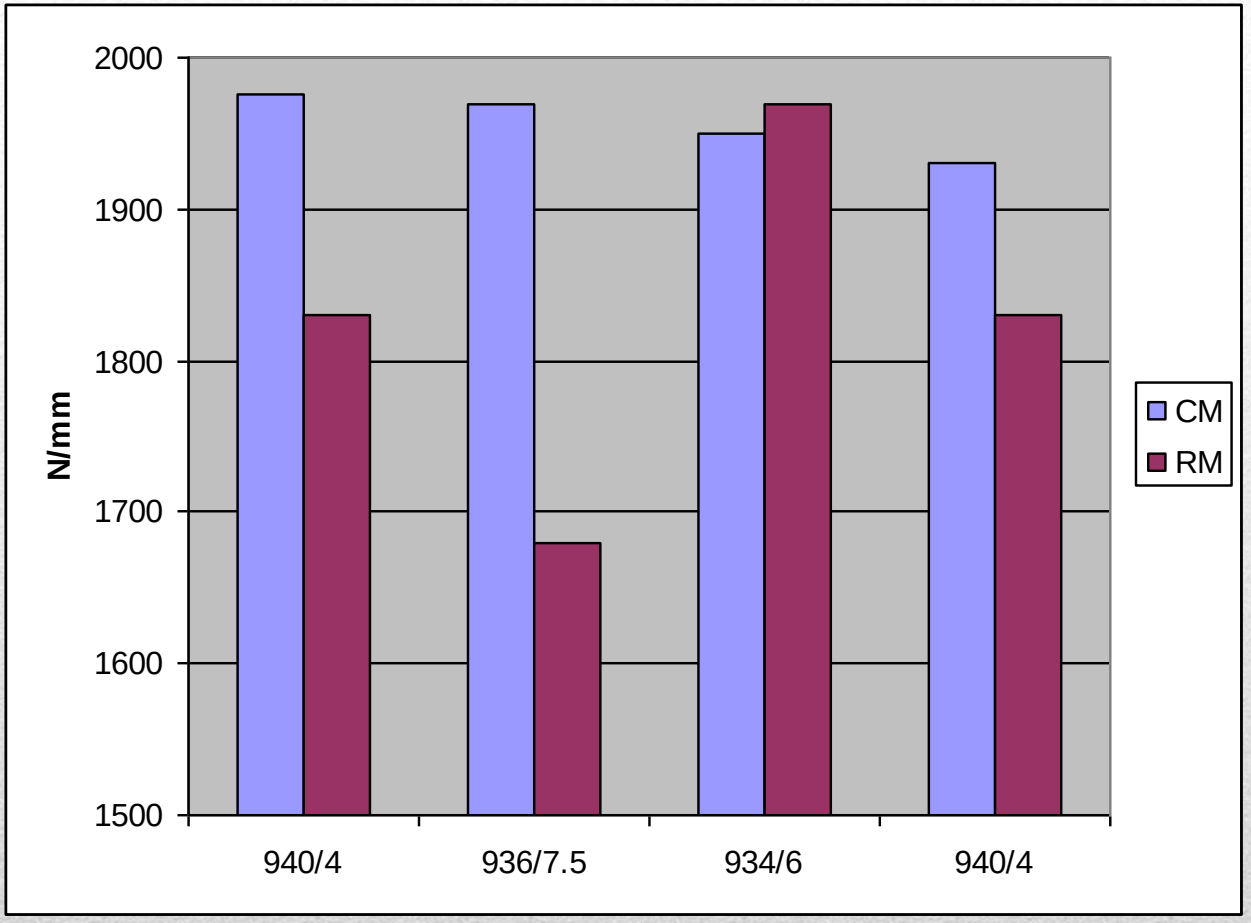
Tensile Modulus

Source: Norner



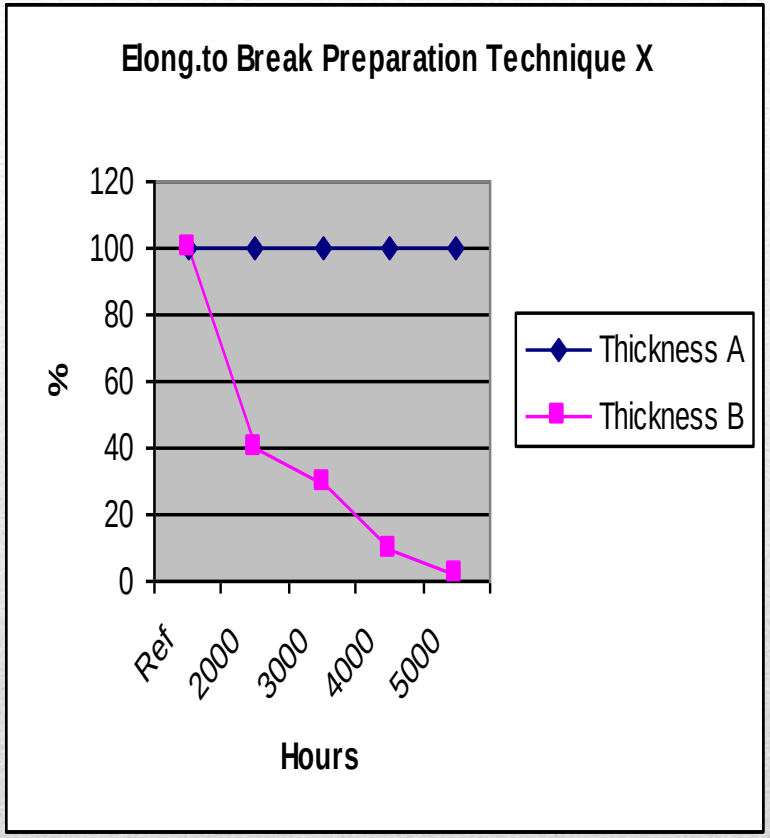
Heat Deflection Temperature

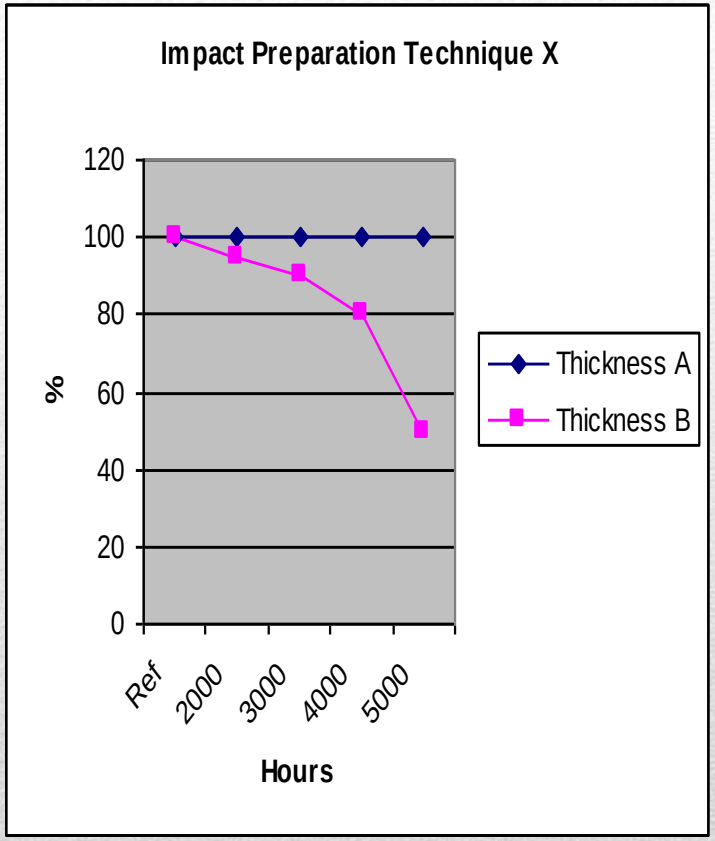
Source: Norner



Impact Strength

Source: Norner

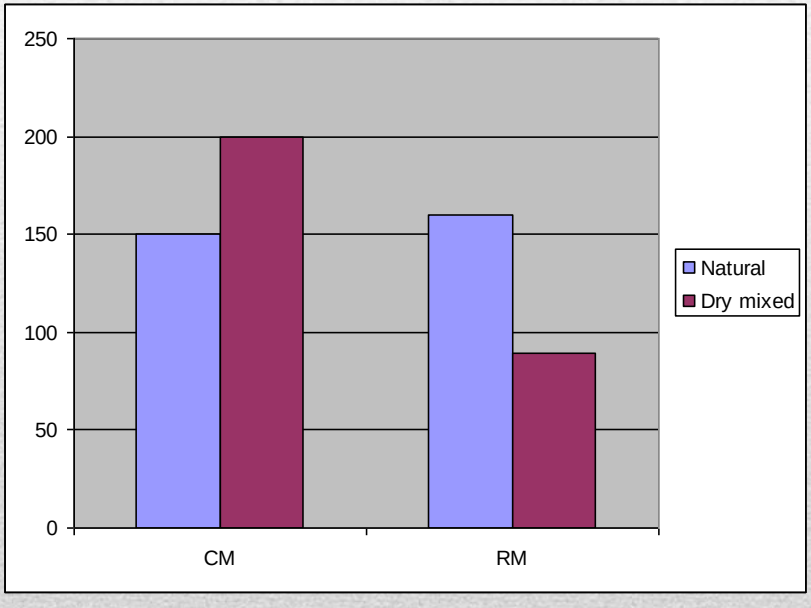


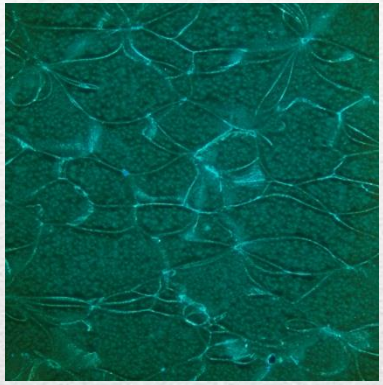


UV classification

Source: Norner

- All specimen to be tested on compression moulded specimen, processed according to ISO293
- except ARM Impact





Harmonisation

Harmonisation

Test	Standard
Mfr	ISO1133 / ASTM D1238
Density	ISO1183 / ASTM D1505
Flexural Modulus	ASTM D790
Tensile stress and strain at yield	ISO527-2 / ASTM D638
FNCT	ISO16770
ARM impact	ARM std
HDT	ISO75-2 / ASTM D648
Tensile creep	ISO899 / ASTM D2990
UV rating	ISO4892 / ASTM D4329

	Test	Standard	Material Source	Specimen thickness	Temperature	Extension	footnote
1	Mfr	ISO1133 / ASTM D1238	Pellets or powder		23 C	g/10 min	
2	Density	ISO1183 / ASTM D1505	String from mfr, cooled in room temp for 24 hours		23 C	kg/m3	
3	Flexural Modulus	/ ASTM D790	Compression moulded specimen	4 mm	23 C	Mpa	1
4	Tensile stress and strain at yield	ISO527-2 / ASTM D638	Compression moulded specimen	4 mm	23 C	Mpa / %	1
5	FNCT	ISO16770	Compression moulded specimen	10 mm	50 C	h	1,3,8
6	ARM impact	ARM std	Rotationally moulded specimen	3,17 and 6,34 mm	-40 C	J	6,9
7	HDT	ISO75-2 / ASTM D648	Compression moulded specimen	4 mm		C	1,4
8	Tensile creep	ISO899 / ASTM D2990	Compression moulded specimen	4 mm		Available: yes	1,2
9	UV rating	ISO4892 / ASTM D4329	Compression moulded specimen	2 mm		UV -2-4-6-	1,5,7

1 All specimen to be tested on compression moulded specimen, pressed according to ISO293, except ARM Impact

2 Creep curves must be available on request, tested at 3 different temperatures, preferably 23 C, 40 C and 60 C and at 3, 4 and 5 MPa

3 Force = 6 Mpa, 2% Akropal or Igepal,

4 0.45 Mpa, Edgewise

5 Samples must be compression moulded from a RM article, pelletised (chopped) and tested according to EN13341

6 Thickness of sample =3.17 mm +0.0 /-0.2mm and 6.34 mm +0.0 /-0.4mm.

7 UV tested after ISO4892 must be multiplied by 1.4 to be compared with ASTM D4329

8 Specimen: 90*10*10mm with a 1.6 mm circumferential notch. Bath: 2% Arkopal or Igepal, with temperature 50^{0}C
Load: 6MPa. Minimum number of test specimen to be tested: 3

9 Process the material to none or close none bubbles in the cross section of the rotational moulded article. Note the PIAT for the 3.17 mm (+0.0 / -0.2 mm) and the 6.34 mm (+0.0 / -0.4 mm) RM article. Cooling rate should be <9 C/min. Demoulding temp = 90 C. Use the 4,54 kg (10 lb) dart for the 3.17 mm specimen and the 13,61 kg (30 lb) dart for the 6.34 mm specimen. The dart must hit the o utside surface of the specimen. Minimum number of test specimen to be tested: 20 / thickness

Testing Guideline

ARMO Committee

- Ronny Ervik, Nordic ARM - Committee Chairperson
- Dru Laws, ARM — Nth America
- Ian Hansen, ARMA — Australasia
- Gary Lategan, ARMSA — Sth African
- Nick Henwood, BPF — Britain

Thanks