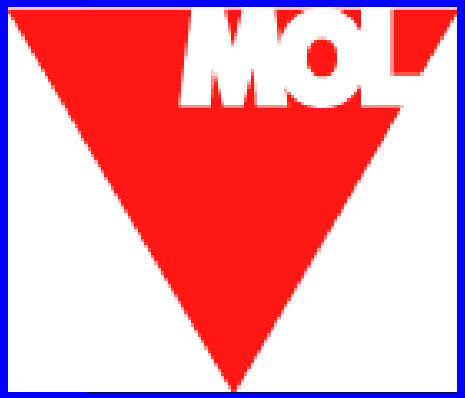
Petrochemical Division of MOL Group



Introduction of MOL Group

- MOL is an integrated Hungarian oil and gas company having 8 million tons/year refinery capacity in Hungary.
- MOL Group (including MOL, Slovnaft and INA) has altogether 20.1 million tons/year refinery capacity and 1,256 petrol station in Central Europe (Hungary, Slovakia, Croatia, Slovenia, Czech Republic, Poland, Romania, Ukraine, Bosnia).
- MOL is aspired to regional leading role having:
  - ❑ 98.4 % stake in Slovnaft (Slovakia)
  - ❑ 25 % stake in INA (Croatia)
  - ❑ 44.35 % stake in TVK (Hungary)

Introduction of TVK

- **TVK is an integrated polyolefin producer located in Tiszaújváros, Hungary, approximately 180 km east of Budapest.**

- **TVK is a leading petrochemical company in Central Eastern Europe and accounts for over 20 % of current polyolefin capacities in this region.**

- **TVK and its consolidated subsidiaries with 1,983 employees produced a sales revenue of EUR 527 million in 2003 (preliminary data).**

- **54 % of TVK's sales revenues came from domestic, 46 % from export sales in 2003. Almost the whole export sales revenues arose from Europe, especially from Germany, Italy, Austria, France, Great Britain and Poland.**

History of TVK

1953. Founded as Tiszavidéki Vegyi Kombinát

1995. Introducing to the Stock Exchange of Budapest

2000. Sale of plastic processing companies

Most important owners

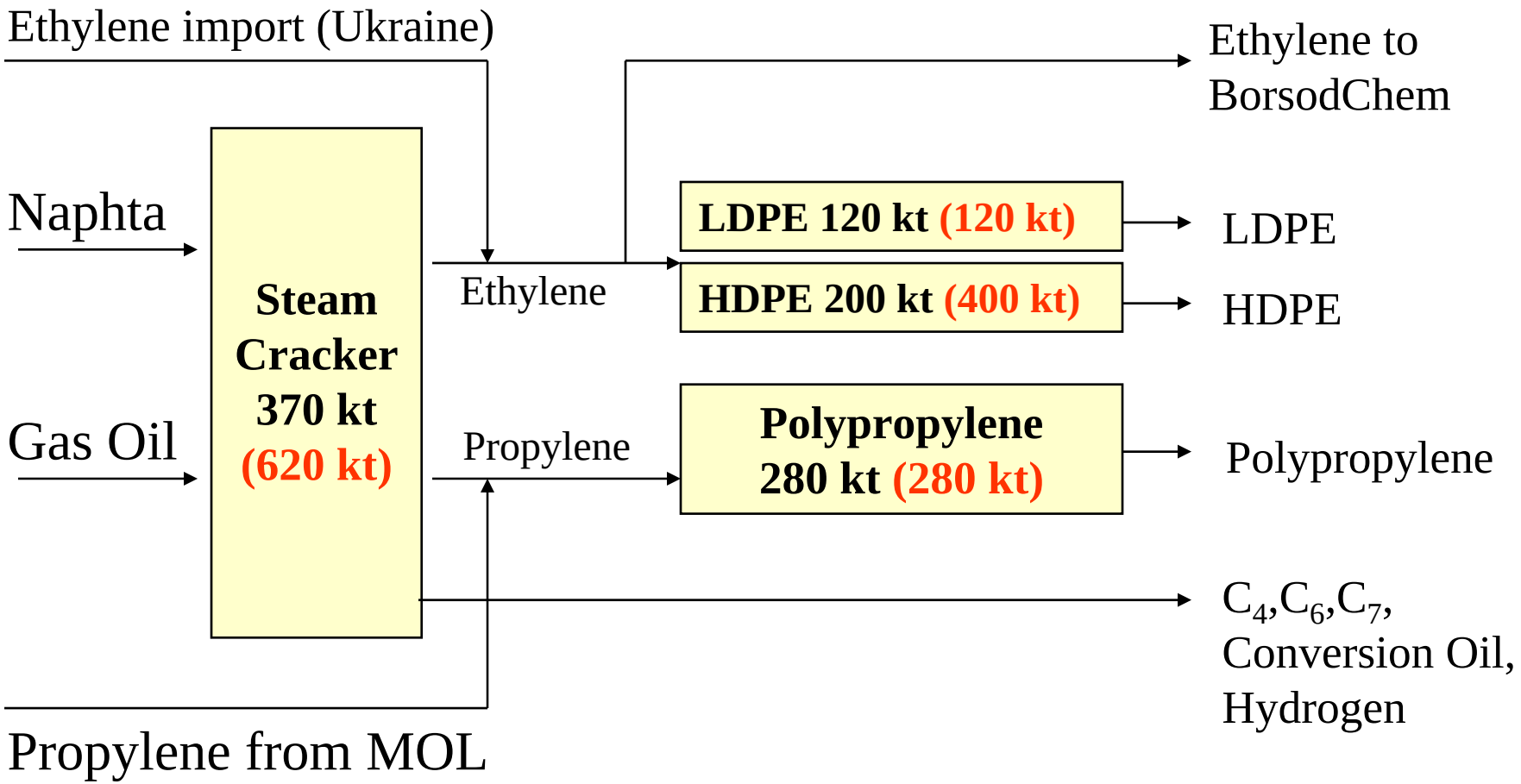
till 1995 Hungarian state

from 1995 Mixed (mainly western banks, financial institutions)

from 2001 MOL Rt. is the dominant owner having 44.35 % stake in TVK.

Vertically integrated operations and capacity of TVK

(actual annual capacity, after expansions)



SLOVNAFT
historical milestones

1895 – Apollo - a private company

1949 – Apollo nationalized as SLOVNAFT – a state owned company

1974 – new petrochemical plant started-up

1992 – 1st step of privatization (20%)

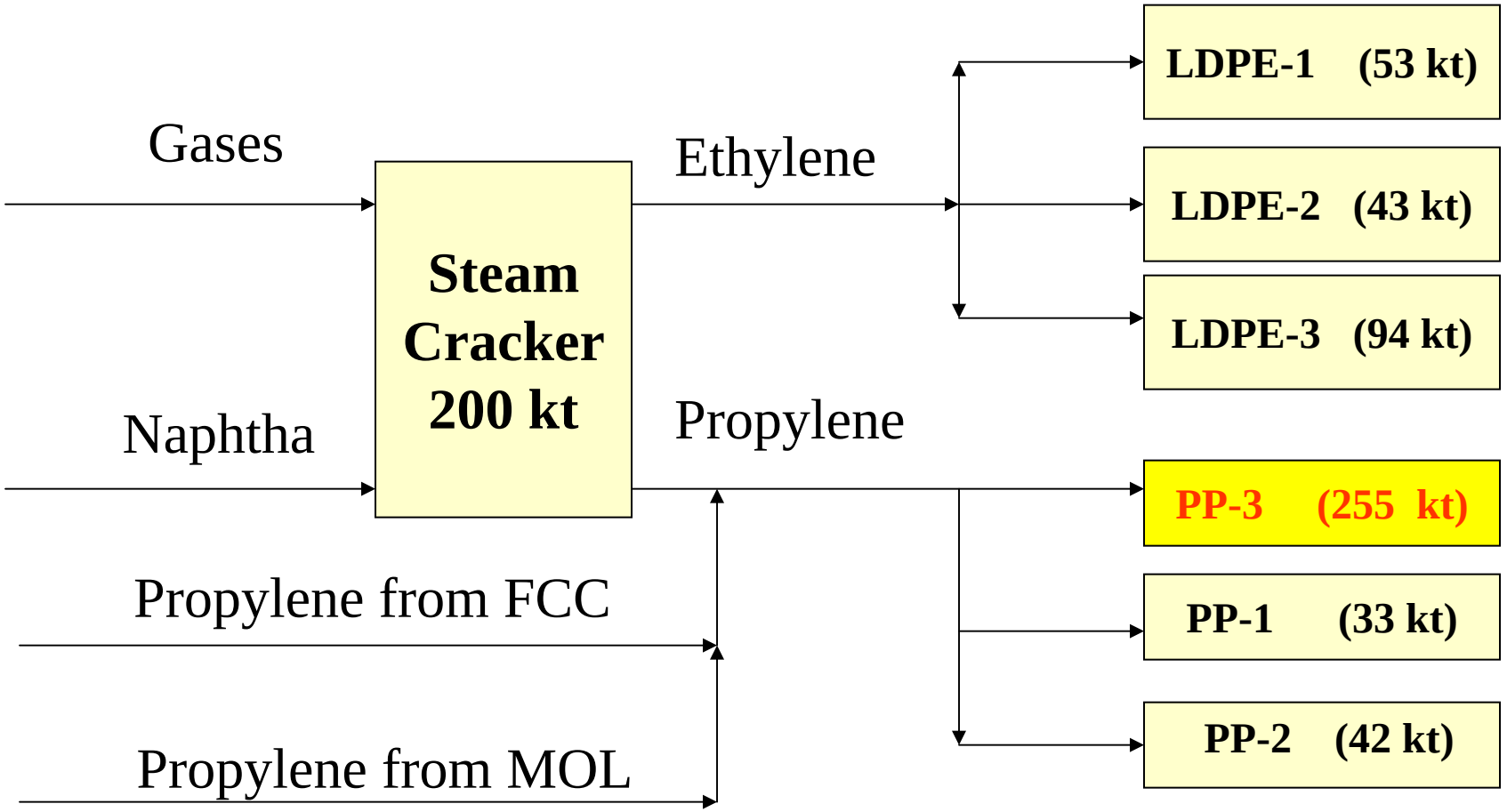
1996 – privatization of majority stake bought by Slovintegra, the management/employees company (51%)

2000 – MOL – the strategic partner

2004 – MOL is the major owner having 98.4 % stake

Vertically integrated operations and capacity of Slovnaft in Bratislava

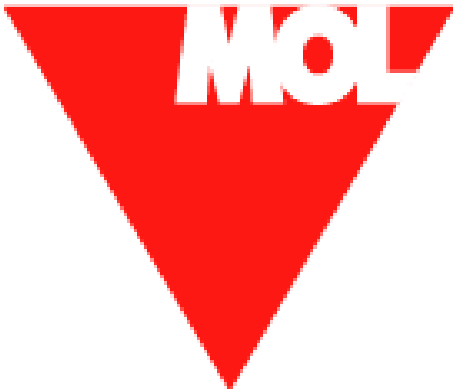
(actual annual capacity, after expansion)



Note: After start-up of new PP-3 unit in 2005, older PP-1 and PP-2 will be closured.

Integration

„Creating a Multinational Company”



Petchem Integration in MOL Group

- **Activity of Petchem Division - polyolefin production and sales**
- **D1 - 1st of January, 2004 for all of the business and business related processes**
- **HQ – Bratislava, Slovakia**
- **Fully integrated operation in Sales & Marketing and Production**
- **Cross country (Slovakia, Hungary), cross site (Bratislava, Tiszaújváros and Budapest) and cross company (Slovnaft, TVK) division**
- **Assets - olefin and polyolefin production, polyolefin logistics**
- **Integrated Controlling activity from D1**
- **Huge investment are in progress:**
  - **Slovnaft: PP 3**
  - **TVK: Steam Cracker 2, new HDPE plant, off site facilities project**

Integration and New Investments

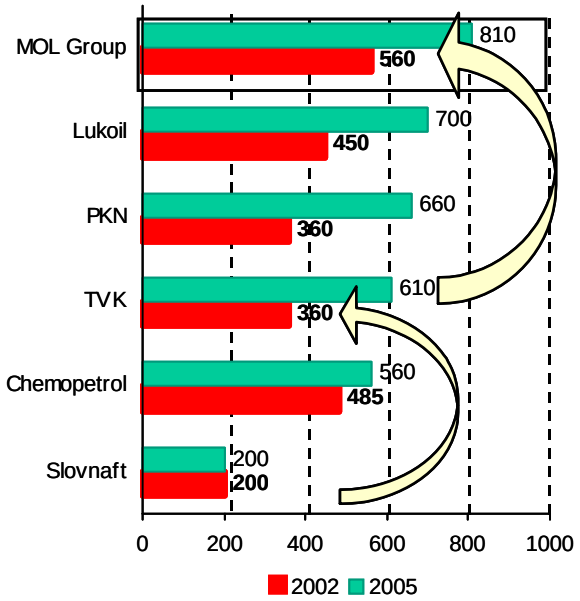
✓ **Strenghening the regional leading role of the MOL Group**

✓ **The targets can be achieved by the already accepted/started projects**

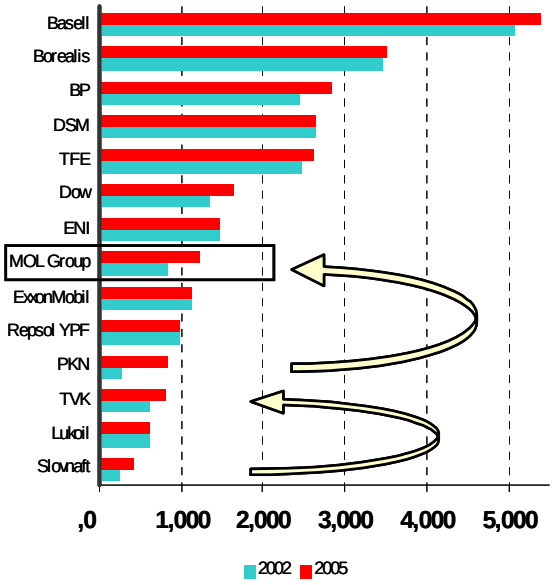
- **Ethylene capacity intensification and new HDPE project worth of EUR 430 million at TVK**
- **PP project at Slovnaft worth of USD 110 million**

✓ **Considerable improvment in costs**

CEE Ethylene Capacities (kt/year)



European Polymer Capacities (kt/year)



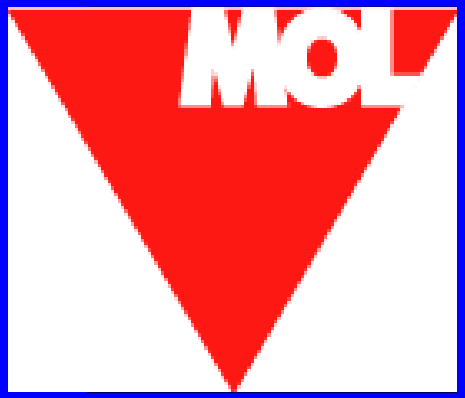
Petrochemical Investments at MOL Group

- **TVK**
  - TVK will make a premarketing for the new HDPE plant between April and December 2004.
  - The commissioning of the new HDPE plant starts from 1st of August 2004.
  - Commercial production of the new HDPE plant will start from November 2004. More than 50 ktons HDPE resin will be produced by the end of 2004.
- **Slovnaft**
  - The new PP plant comes on stream on April 2005.

Central East European Polyolefin Capacities by 2005 (thousand tons)

Country	LDPE	LLDPE	HDPE	PP	Total
Bulgaria	86			80	166
Croatia	155				155
Czech Republic			320	250	570
Hungary	120		400	280	800
Poland	105		320	400	825
Romania	80		30	120	230
Slovakia	168			255	423
Serbia	45		50	30	125
Ukraine	240	100		100	440
Total	999	100	1120	1515	3734
MOL Group (kt)	288	0	400	535	1223
MOL Group (%)	28,8	0	35,7	35,3	32,8

Polyolefin Product Range of MOL Group



Polyolefin Product Range of TVK

- LDPE product range of TVK with a trade name of TIPOLEN
  - LDPE-1 (ICI autoclave process):
    - **FA 2210** heavy duty film grade for bags, shrink and agricaltural films (MFI: 0.3, density: 0.922)
    - **OF 2019** injection moulding grade (MFI: 20, density: 0.920)
  - LDPE-2 (Lupotech T process of Basell):
    - **FA 244-51** heavy duty film grade having MFI 0,28
    - Fine film grades for high speed drawn-down and confectioning having MFI 0.8, 2 and 4 with or without slipping and antiblocking agents

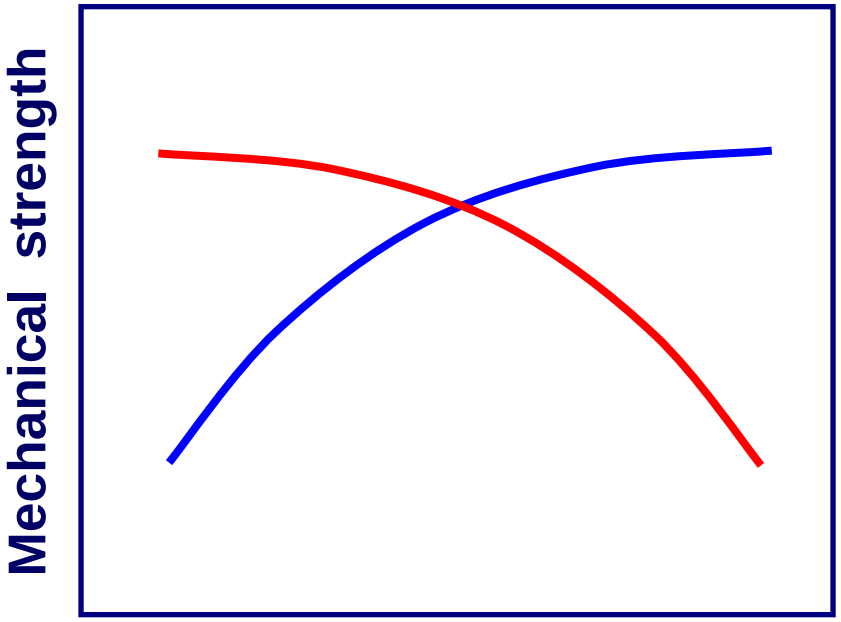
Polyolefin Product Range of TVK

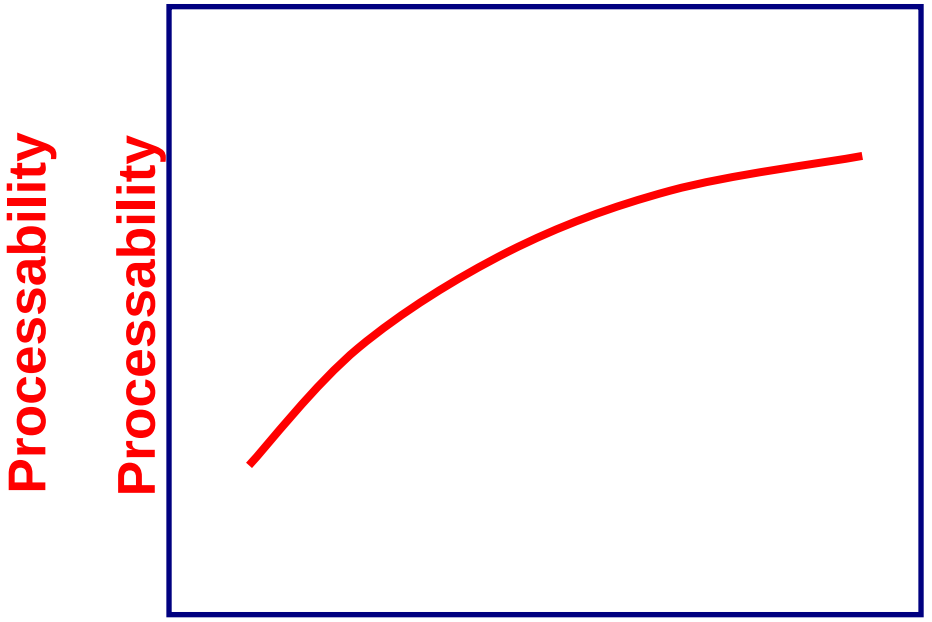
- Existing HDPE film grades of TVK under trade name of TIPELIN:
  - HDPE-1 (Chevron Phillips slurry loop process):
    - **FS 340-03** MDPE film grade for heavy duty bags, shrink film with blending to LDPE (HLMI: 14, density: 0.934)
    - **FA 381-10** MDPE film grade for shopping bags, shrink film with blending to LDPE (MI: 0.28, density: 0.938)
    - **FS 471-02** HDPE film grade for thin packaging films, shopping bags, trash bags (MI: 0.18, density: 0.947)

Polyolefin Product Range of TVK

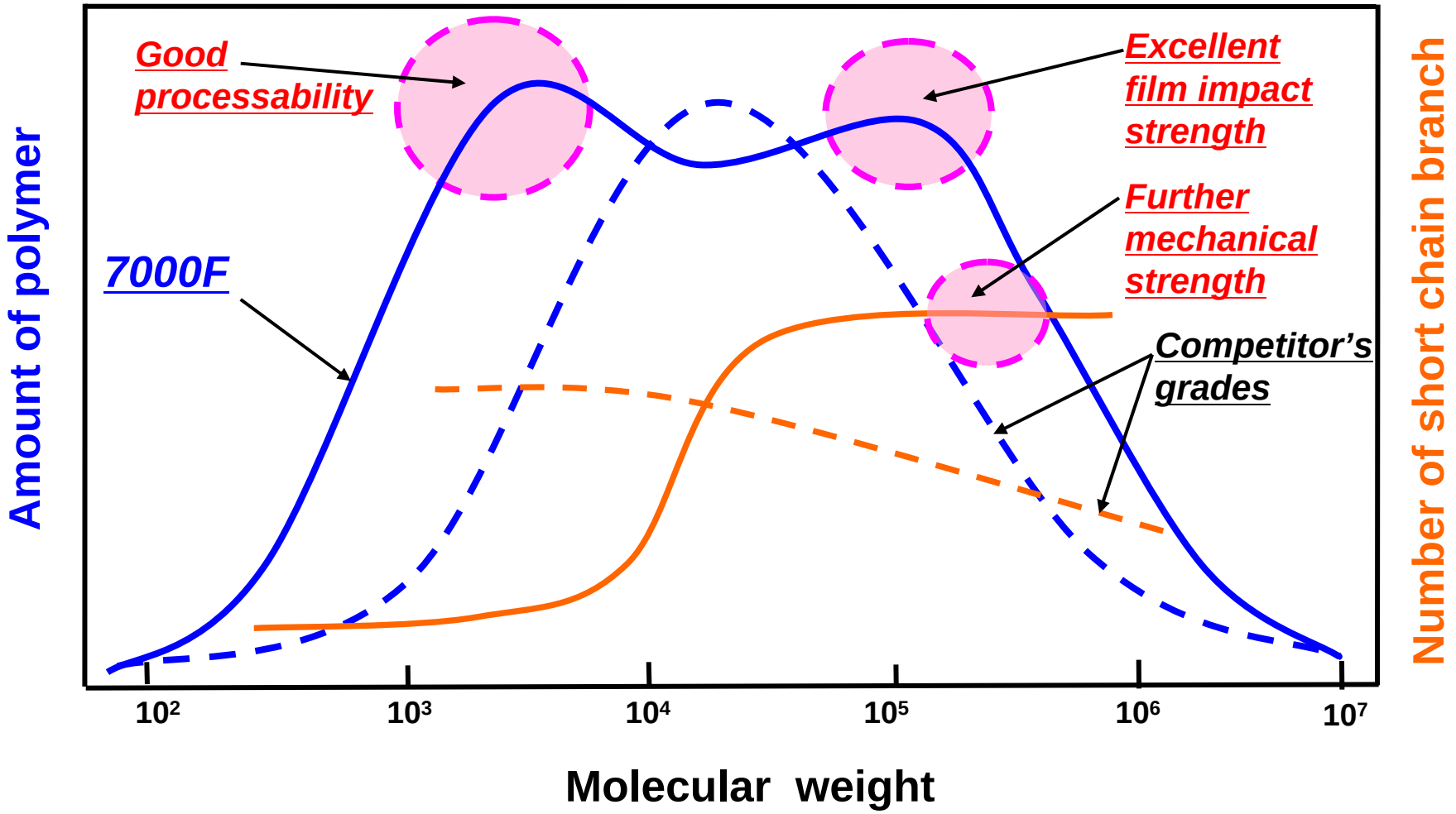
- New bimodal HDPE film grades of TVK under trade name of TIPELIN:
  - HDPE-2 plant (Mitsui CX process):
    - **7000F** high MW film resin with excellent procesability (at high speed), excellent mechanical strength for the production of tissue-like film, shopping bags, disposal waste bags (MI: 0.04, density: 0.953)
    - **8000F** high MW film resin with excellent mechanical strength for heavy duty bags, disposal waste bags (MI: 0.03, density: 0.947)

MECHANICAL STRENGTH AND PROCESSABILITY OF HDPE





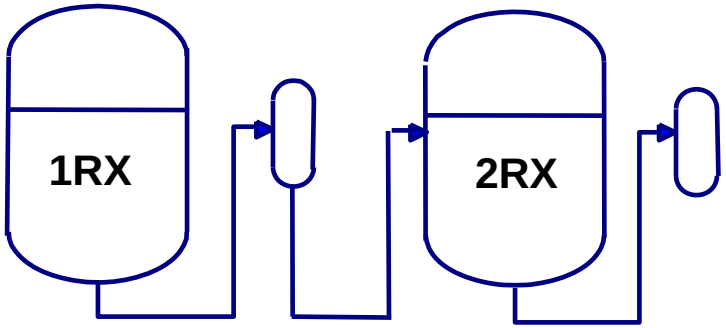
COMPARISON OF TVK's NEW HDPE FILM GRADE WITH COMPETITOR'S GRADE



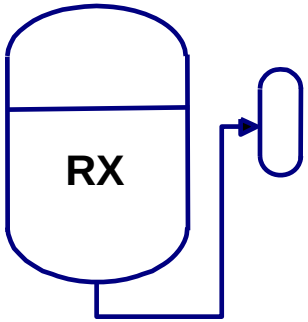
MWD AND CD CONTROL

CD : Composition Distribution

CX Process

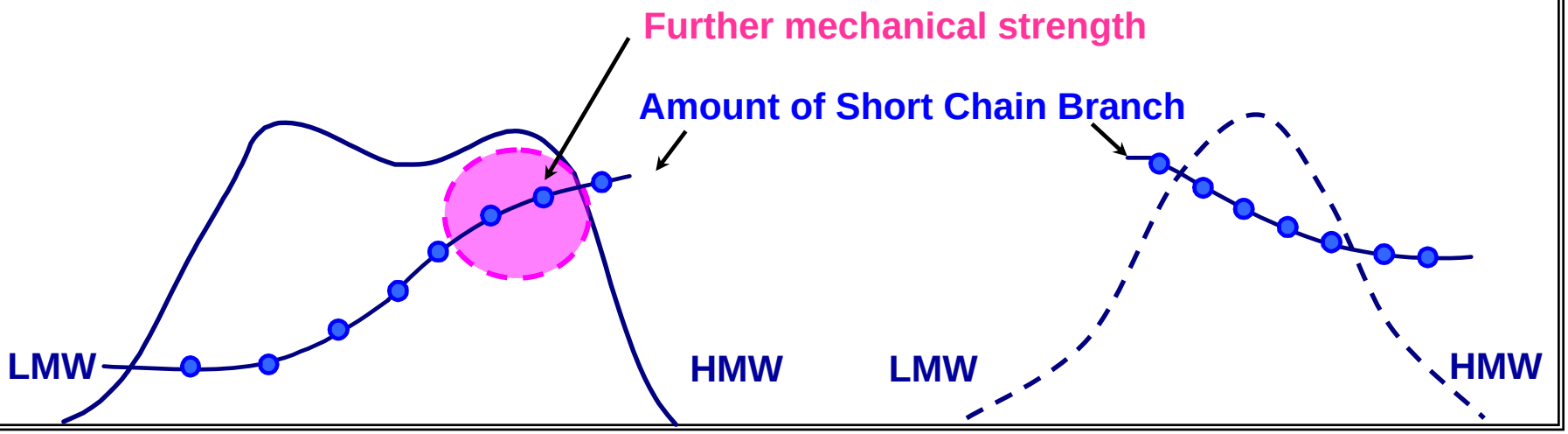


Other Process



Bimodal Product - CX Process

Unimodal Product - other Process



Polyolefin Product Range of TVK

- HDPE blow moulding grades of TVK with the trade name of TIPELIN.
  - Unimodal grades from our existing HDPE-1 plant (Phillips slurry loop process):
    - **BS 520-14** for drums and cans for the packaging of agressive industrial and household chemicals (HLMI: 10, density: 0.952)
    - **BS 501-17** bottles and cans for the packaging of household chemicals (MI: 0.2, density: 0.950)
    - **BA 550-13** bottles for the packaging of non-agressive chemicals and oil (MI: 0.35, density: 0.955)

Polyolefin Product Range of TVK

- New HDPE blow moulding grades of TVK
  - Bimodal grades from the new HDPE-2 plant (Mitsui CX process):
    - **8200B:** High MW grade with very high ESCR (>600 hours) for drums and large-sized industrial containers for chemicals, automobile fuel tank (MI: 0.025, density: 0.952);

      8200B will replace BS 520-14 resin.
    - **6200B** bottles and cans for the packaging of household and industrial chemicals with very high ESCR: >600 hours (MI: 0.35, density: 0.956)
    - **6500B** bottles for the packaging of non-agressive chemicals, oil (MI: 0.35, density: 0.962, ESCR: 50 hours)

Polyolefin Product Range of TVK

- HDPE pipe grades of TVK
  - Unimodal PE-80 MDPE pipe resin from our existing HDPE-1 plant:
    - **PS 380-30/302:** black resin classified as MRS 8.0 material (PE80) for water and gas pressure pipes, fittings (MI: 0.2, MLMI: 1.0, density: 0.949, ESCR: >2000 hours)
  - Bimodal PE-100 HDPE pipe resin from the new HDPE-2 plant:
    - **7700M:** High MW grade with high ESCR (>1000 hours) for water and gas pressure pipes. It will be available in black, blue and orange colours.

      7700M black has MLMI: 0.23, HLMI: 7.1, density: 0.957. Classification will be ready for the beginning of 2006.

Important Properties of Pipe Materials

- **Fracture Toughness (RCP):**

  High resistance to rapid crack propagation (RCP). Quick crack arrest if a gas pipe bursts due to external forces.

- **Slow Crack Growth Resistance (SCG):**

  Insensitivity to notches on the pipe surface and at welding joints. High resistance to SCG gives durability and protection against brittle failures.

- **Long Term Hydrostatic Strength (MRS)**

  Creep rupture strength characterizes the stress limit for ductile failures.

- **Low Sagging:**

  Production of pipes with thick walls and constant wall thickness.

- **Processability:**

  High and constant output rates on extrusion lines. High pipe surface quality (smooth, no gels).

Polyolefin Product Range of TVK

PP grades of TVK with the trade name of TIPPLEN and their applications

- **Homopolymers**

  H781F: rigid and flexible straps

  H681F: extruded sheet for thermoforming of containers

  H649F, H650F: high speed biorented film for packaging

  H388F: cast film for packaging

  H483F: fibres for non-woven fabrics

  H384F, H145F: staple fibres for carpets

  H116F, H917A, H949A: injection moulded household articles, toys, thin-walled containers

Polyolefin Product Range of TVK

PP grades of TVK with the trade name of TIPPLEN and their applications

- **Random copolymers**

  R351F, R451F: transparent cast film for packaging as monolayer film or as welding layer in coextruded structures

  R359, R959A: transparent injection moulded household articles, containers

- **Impact copolymers**

  K899: pipes (pressure pipes, corrugated, etc.) and fittings

  K793, K693: extruded (corrugated) sheet

  K597, K499, K392, K397, K299: injection moulded household articles, toys, pails, battery cases, garden furniture (chair, table), articles and parts for electrical, automotive and electronic industries; injection moulded containers for foodstuffs, cosmetics, detergents and toiletries

  K948, K1048: high speed injection moulded food-grade containers

Polyolefin Product Range of SLOVNAFT

LDPE grades with the trade name of BRALEN and their applications

- **RB 03-23, FB 03-53:** heavy duty film grade for bags, shrink and agricaltural films (MFI: 0.35)
- **FB 08-64** shrink film, industrial film (MFI: 0.8)
- **FB 2-30** Fine film grade for packaging, carrier bags
- **NA 7-25**: extrusion coating of paper, aluminium
- **VA 20-60, VA 20-61:** injection moulding grades (MFI: 20)
- **SA 70-21**: Ingredient into waxes and electro-insulating materials (MFI: 70)
- **SA 200-22**: Non-woven textiles, ingredient into waxes and electroinsulating materials (MFI: 200)

Polyolefin Product Range of SLOVNAFT

PP homopolymer grades with the trade name of TATREN and their applications:

- **FD 152, FD 154**: Raffia grades for non-woven bags and twines (MFI: 2.5 and 3.5)
- **FD 620**: biorented film for packaging (MFI: 2.7)
- **FF 500**: cast film for packaging (MFI: 10)
- **MF 501, MG 350**: injection moulded household articles
- **MH 926, MI 927**: injection moulded thin-walled containers (MFI: 21 and 30)
- **TF 331, TH 921**: Staple fibres with medium denier (MFI: 10 and 21)
- **TH 931**: Fibres for non-woven textiles, inj. moulding
- **TI 924, TI 922**: Fibres with very low denier (MFI: 30)

New PP Product Range of SLOVNAFT

PP grades from the new PP plant with a capacity of 255 ktpa which comes on stream in April 2005.

- Homopolymers, random and impact copolymers
- Injection and blow moulding, raffia, fibre, cast and bioriented (BOPP) film grades, extrusion grades for the production of sheet for thermo-forming
- Outstanding impact copolymer grades for automotive, electrical and electronics industry

(Note: After start up of the new PP plant two obsolete PP slurry plants will be shut down.)