

# DuPont™ Suva®

refrigerants

## Mutual Solubility of Select HCFCs and HFCs and Water

HCFC-22

HFC-32

DuPont™ Suva® 124

HFC-125

HFC-134a

HFC-143a

HFC-152a

HFC-227ea

HFC-236fa

DuPont™ Suva® 404A

DuPont™ Suva® 407C

DuPont™ Suva® 410A

### Additional DuPont Product Names:

#### HCFC-22:

DuPont™ Freon® 22

DuPont™ Formacel® S

#### HFC-125:

DuPont™ Suva® 125

DuPont™ FE™ 25

#### HFC-134a:

DuPont™ Suva® 134a

DuPont™ Formacel® Z-4

DuPont™ Dymel® 134a

#### HFC-152a:

DuPont™ Formacel® Z-2

DuPont™ Dymel® 152a

#### HFC-236fa:

DuPont™ Suva® 236fa

DuPont™ Dymel® 236fa

DuPont™ FE™ 36

#### HFC-227ea:

DuPont™ FE™ 227



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# Mutual Solubilities of Select HCFCs and HFCs and Water

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## Introduction

This technical bulletin provides mutual solubilities of select HCFCs and HFCs with water. Included are HCFCs 22 and 124; HFCs 32, 125, 134a, 143a, 152a, 227ea and 236fa. Also included are refrigerant blends DuPont™ Suva® 404A, 407C and 410A.

The solubilities were calculated with AspenPlus based on experimental data. Calculation results from 5 to 100°C for water in fluorocarbon (FC) and for 5 to 100°C for FC in water (except as limited by critical temperatures for 32, 125 and 143a) are

summarized in the enclosed graphs. Calculations for the three refrigerant blends were limited to 70°C. Note that these are saturation solubilities — the FC-rich phase, the water-rich phase and the vapor phase are all in equilibrium.

The Aspen calculations are based on NRTL equation of state (Non-Random Two Liquid) parameters derived from experimental data as noted below. Unless otherwise noted, the experimental data are from DuPont internal tests.

	water in FC	FC in water	
HCFC-22	-73 to 38°C *1	10 to 80°C *1	
HFC-32	25 and 55°C	25 and 55°C	
DuPont™ Suva® 124	20 and 60°C	20 and 60°C	
HFC-125	12 and 40°C	12 and 40°C	
HFC-134a	20 and 60°C	20 and 60°C	
HFC-143a	20 and 50°C	20 and 50°C	
HFC-152a	20 and 60°C	20 and 60°C	
HFC-227ea	19.61 and 59.8°C	19.55 and 59.73°C	
HFC-236fa	20, 40 and 60°C	20, 40 and 60°C	
DuPont™ Suva® 404A	see note *2	see note *2	44/4/52 wt% HFC 125/134a/143a
DuPont™ Suva® 407C	see note *3	see note *3	23/25/52 wt% HFC 32/125/134a
DuPont™ Suva® 410A	see note *4	see note *4	50/50 wt% HFC 32/125

### NOTES:

\*1 Literature data.

\*2 Calculated from pure component data for HFCs 125, 134a and 143a.

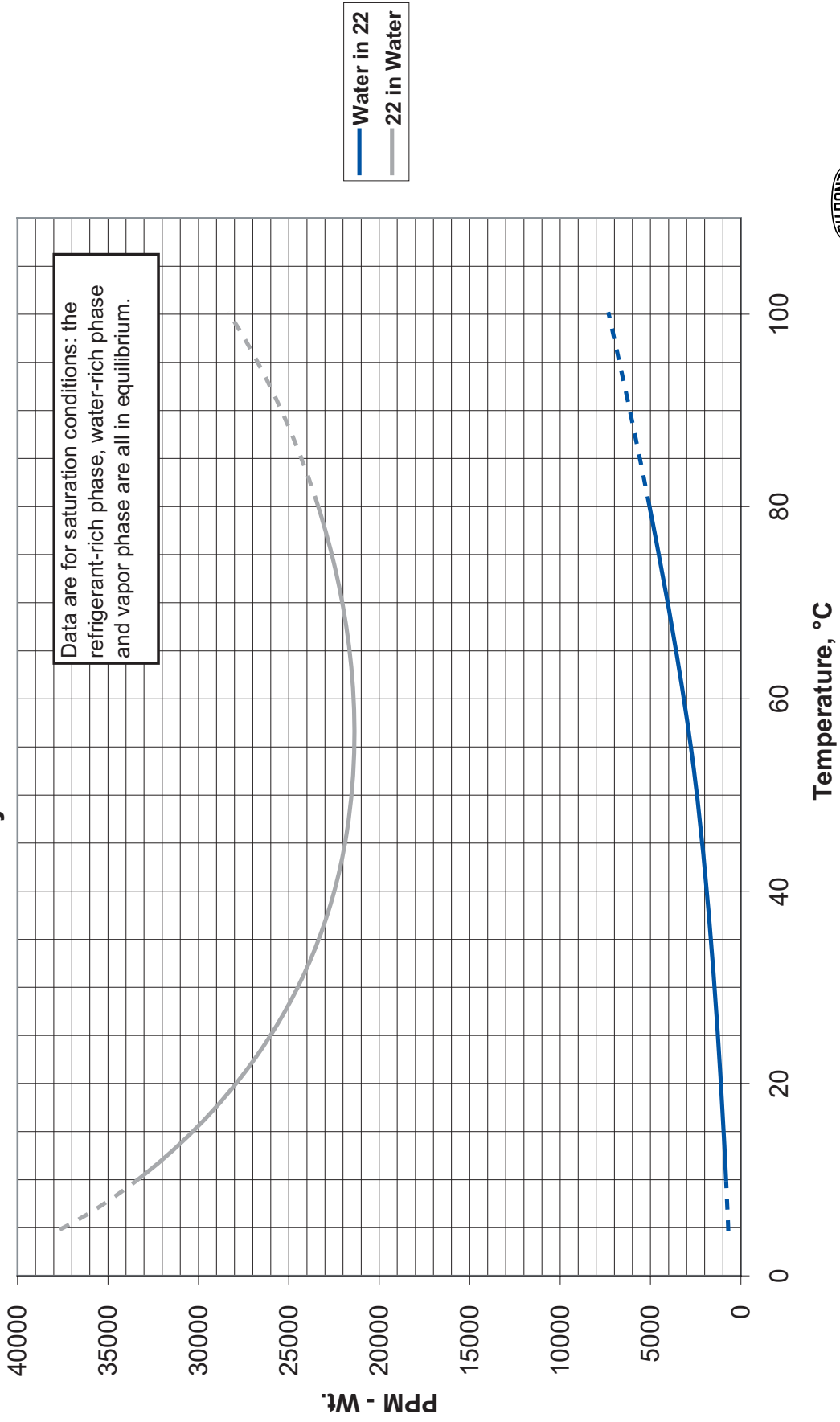
\*3 Calculated from pure component data for HFCs 32, 125 and 134a.

\*4 Calculated from pure component data for HFCs 32 and 125.

It is important to note that extrapolation significantly above or below the experimental data limits may yield approximate results.

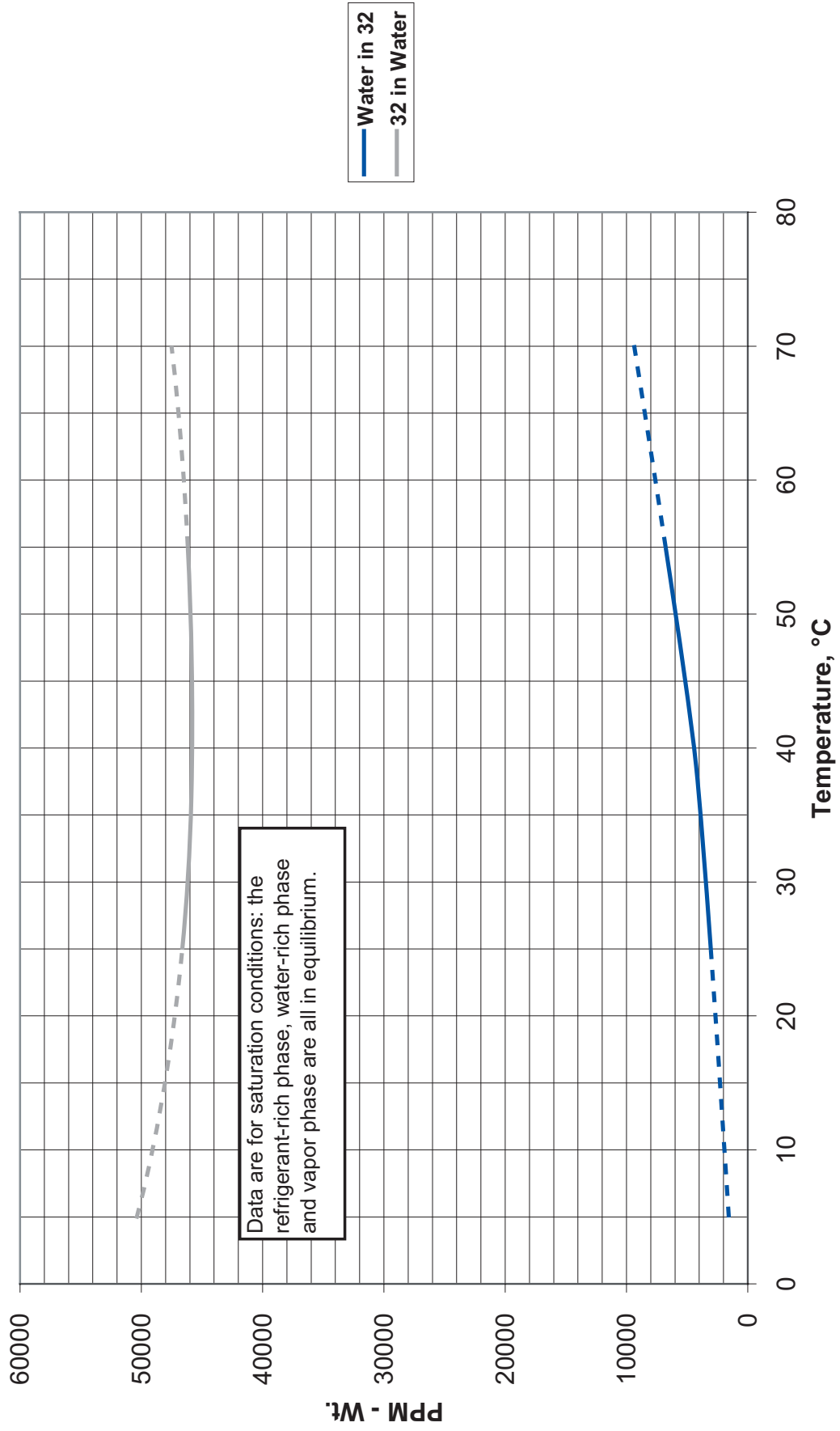
**Note:** On all graphs, measured data is indicated by the solid line.

# Mutual Solubility of HCFC-22 and Water



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# Mutual Solubility of HFC-32 and Water

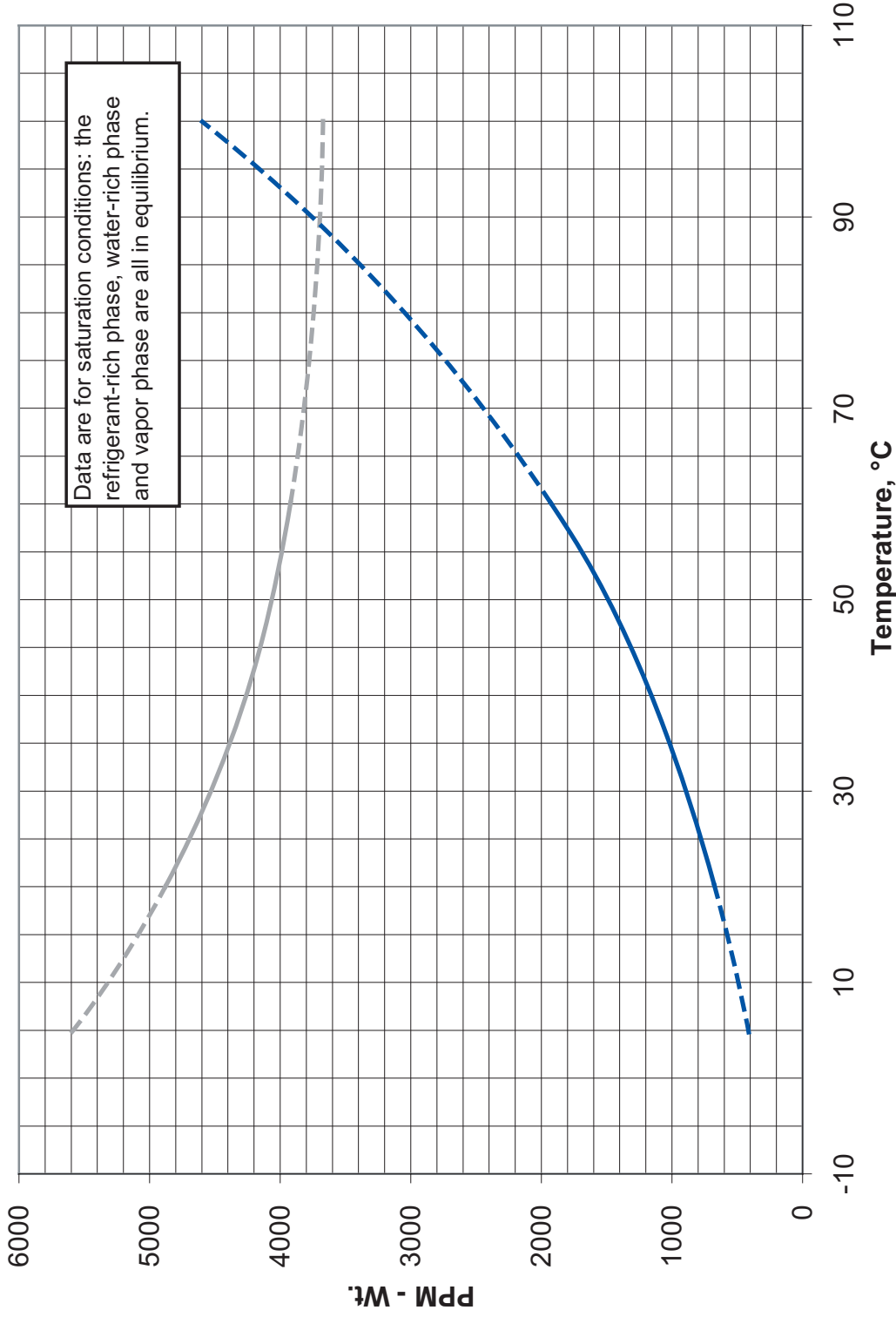


Data are for saturation conditions: the refrigerant-rich phase, water-rich phase and vapor phase are all in equilibrium.



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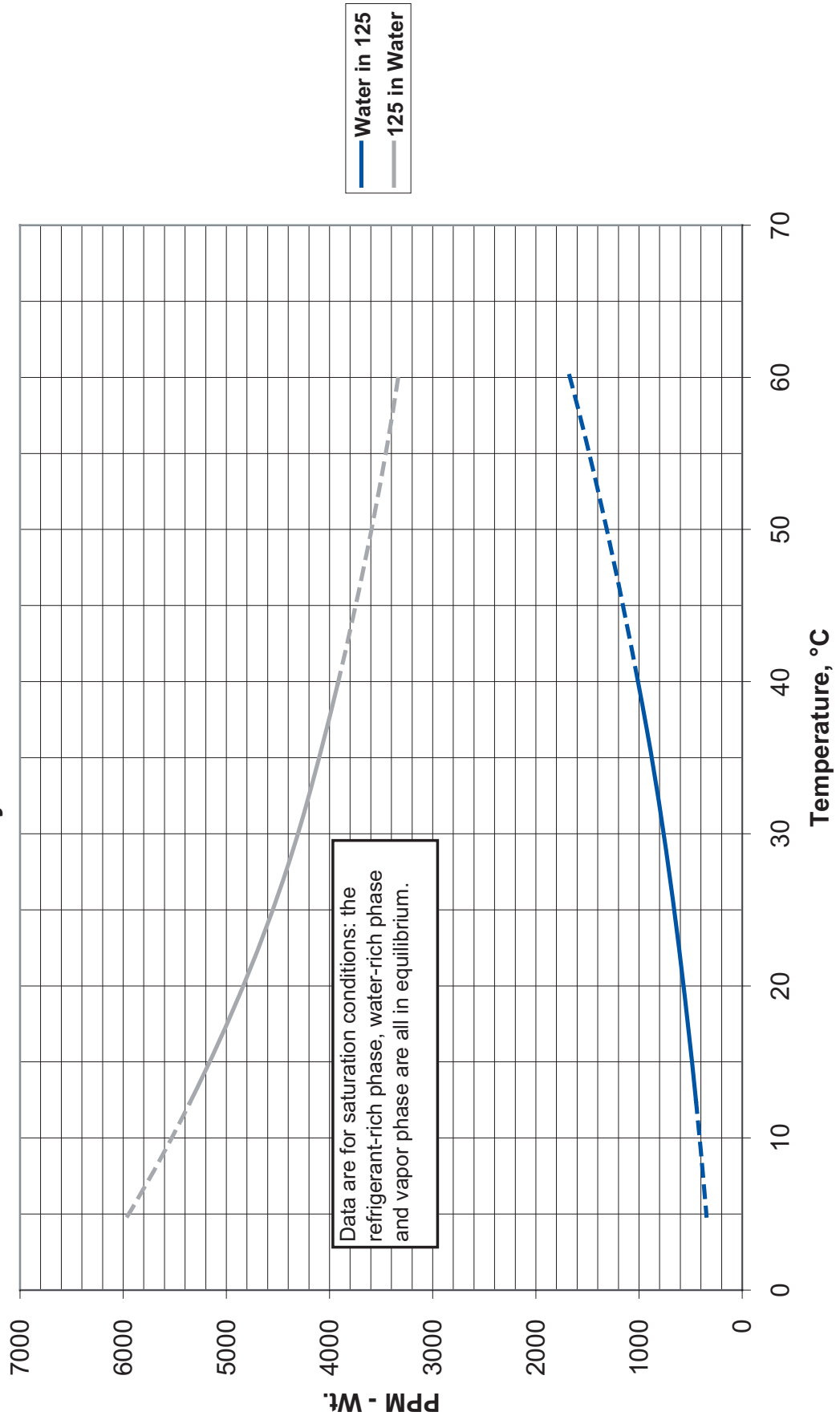
# Mutual Solubility of DuPont™ Suva® 124 and Water



— Water in 124  
 - - - 124 in Water



# Mutual Solubility of HFC-125 and Water



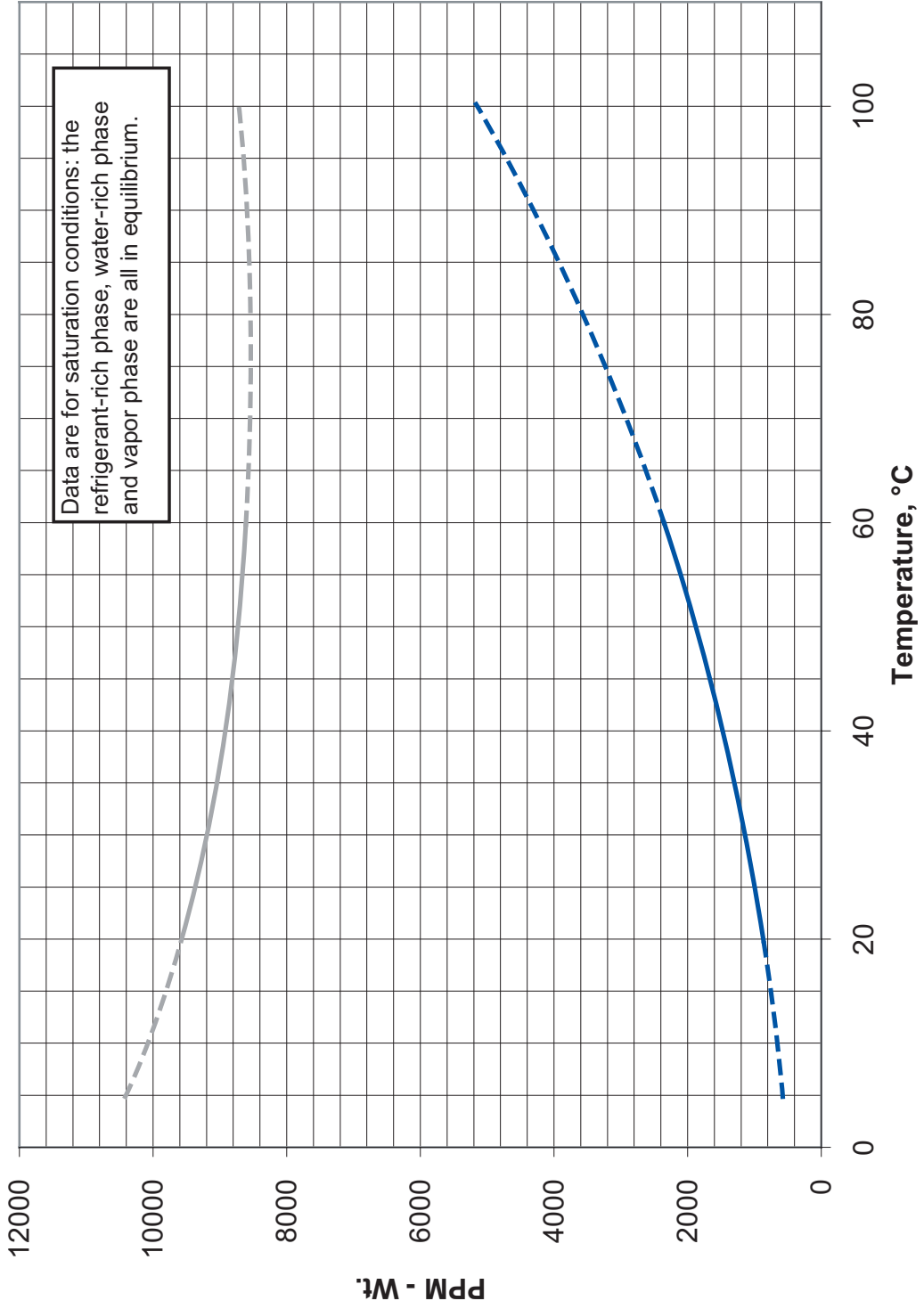
Data are for saturation conditions: the refrigerant-rich phase, water-rich phase and vapor phase are all in equilibrium.

Water in 125  
125 in Water



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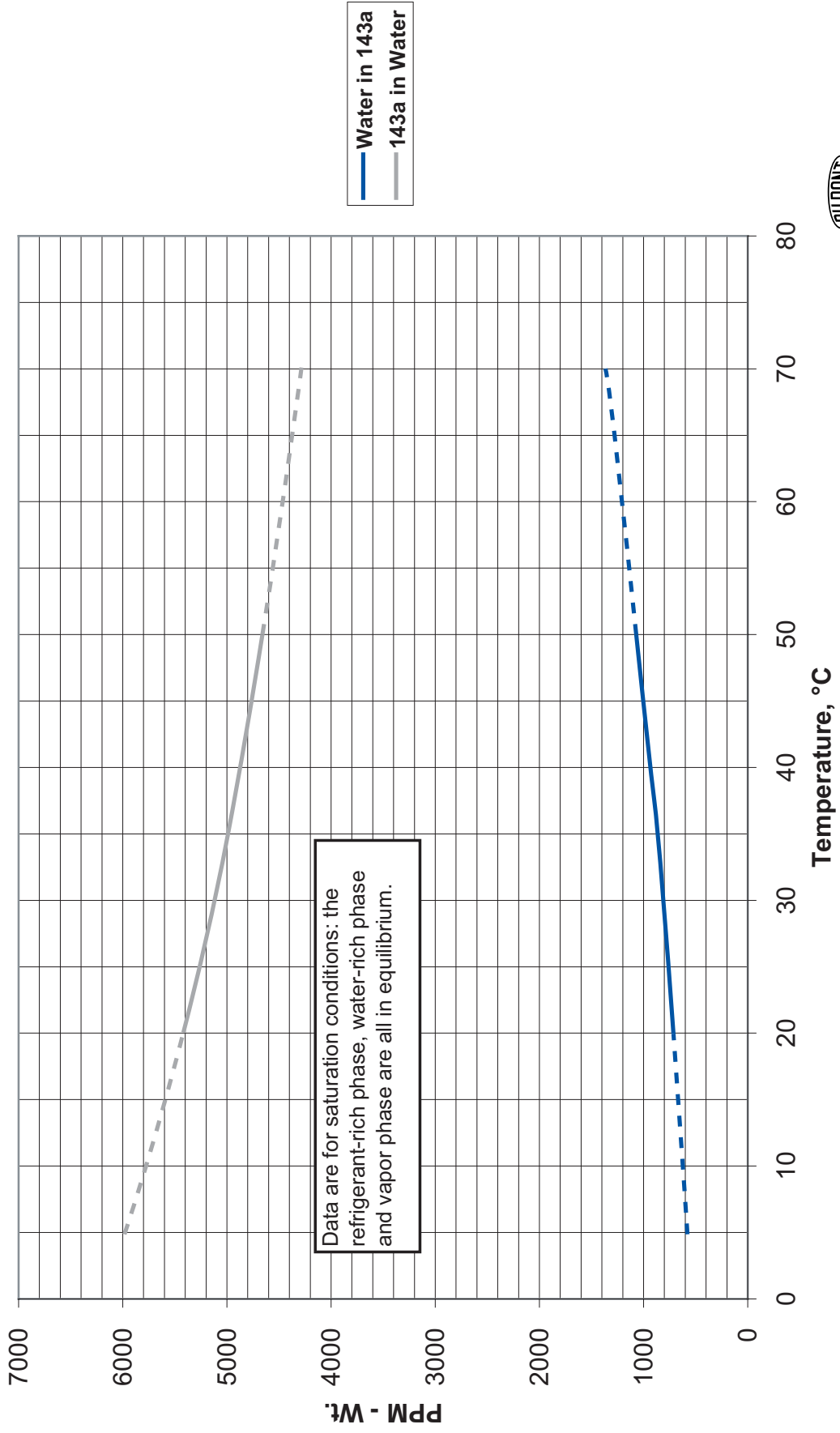
# Mutual Solubility of HFC-134a and Water



— Water in 134a  
 - - - 134a in Water



# Mutual Solubility of HFC-143a and Water

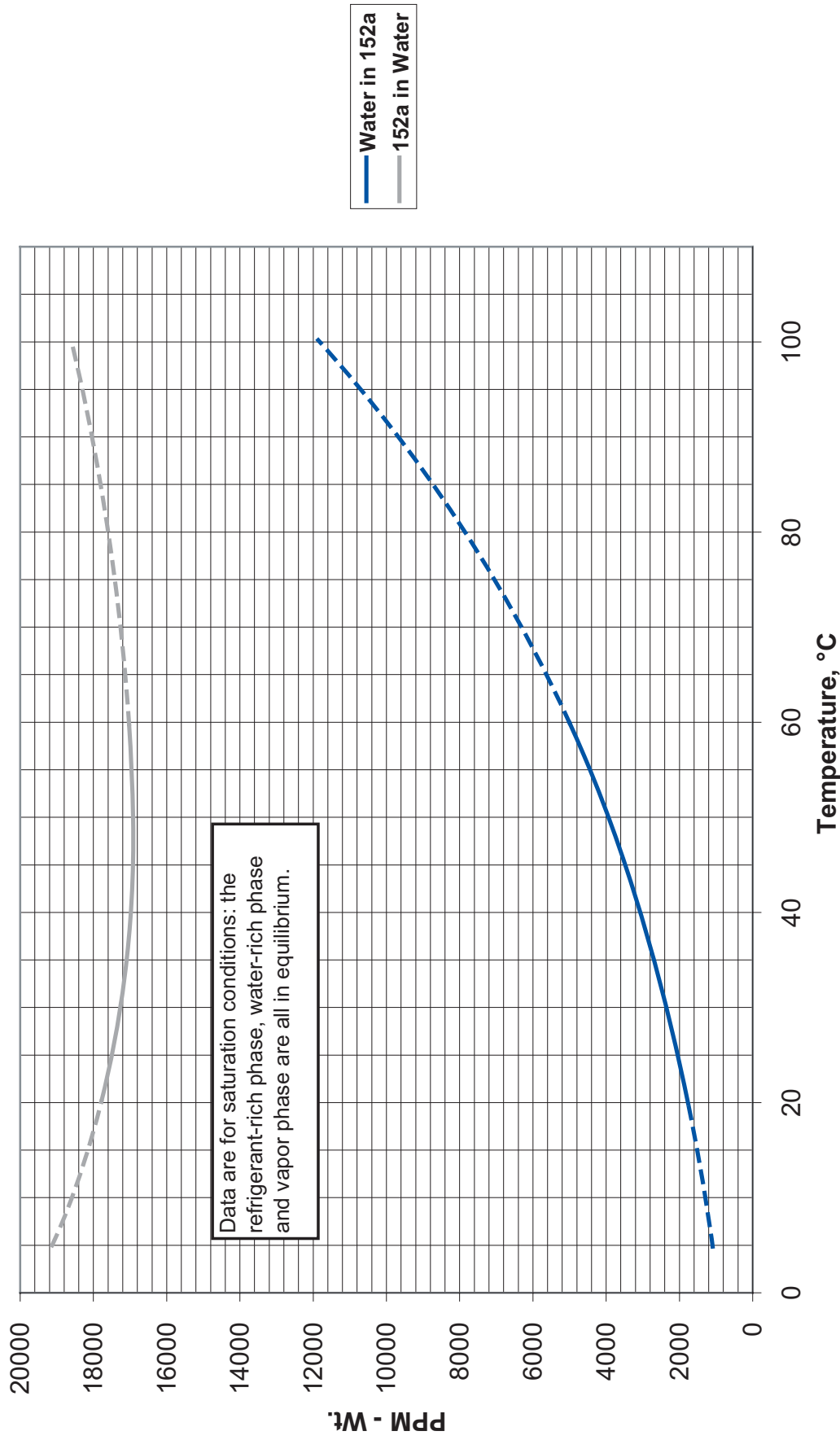


Data are for saturation conditions: the refrigerant-rich phase, water-rich phase and vapor phase are all in equilibrium.



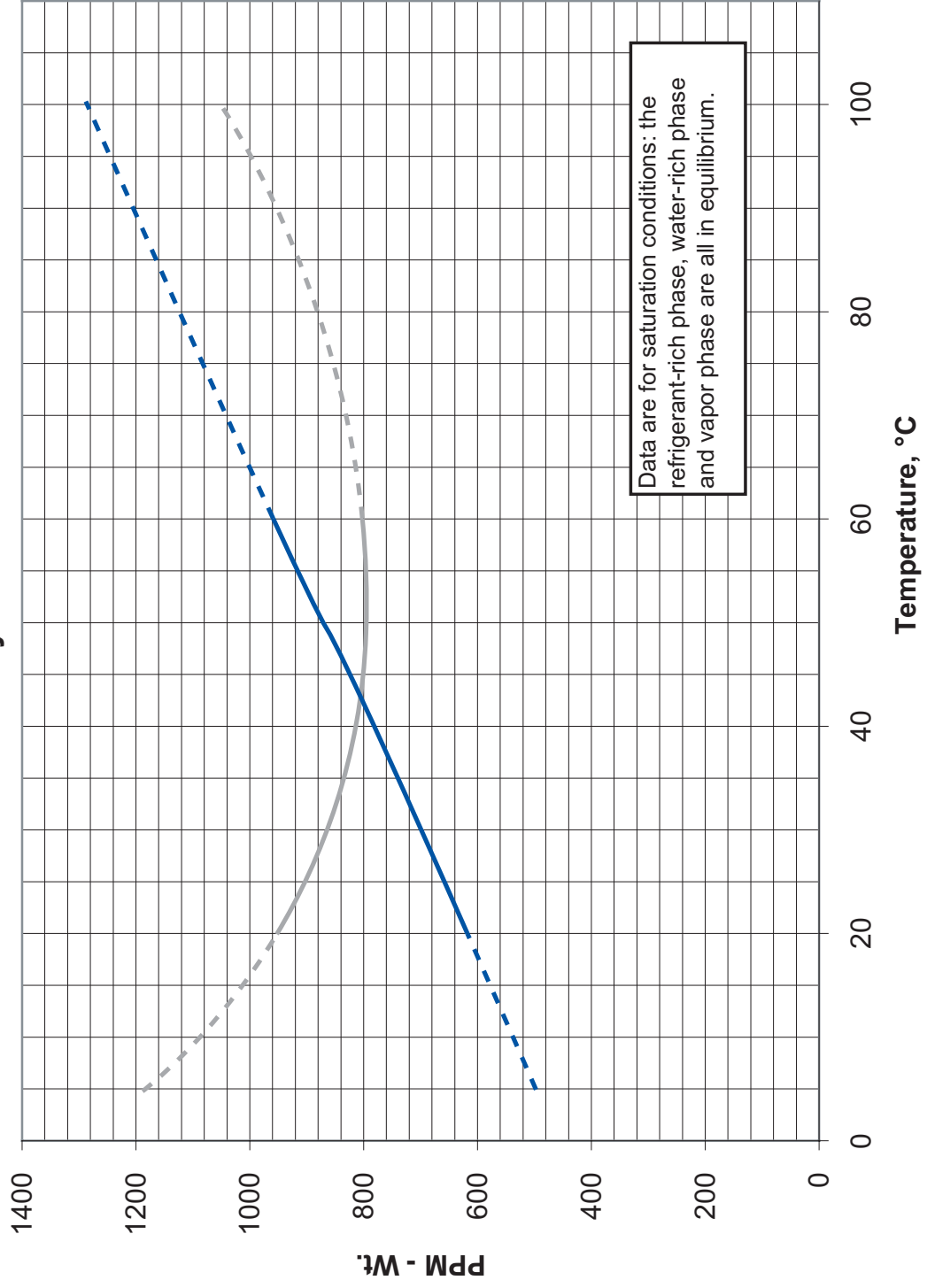
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# Mutual Solubility of HFC-152a and Water



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# Mutual Solubility of HFC-227ea and Water



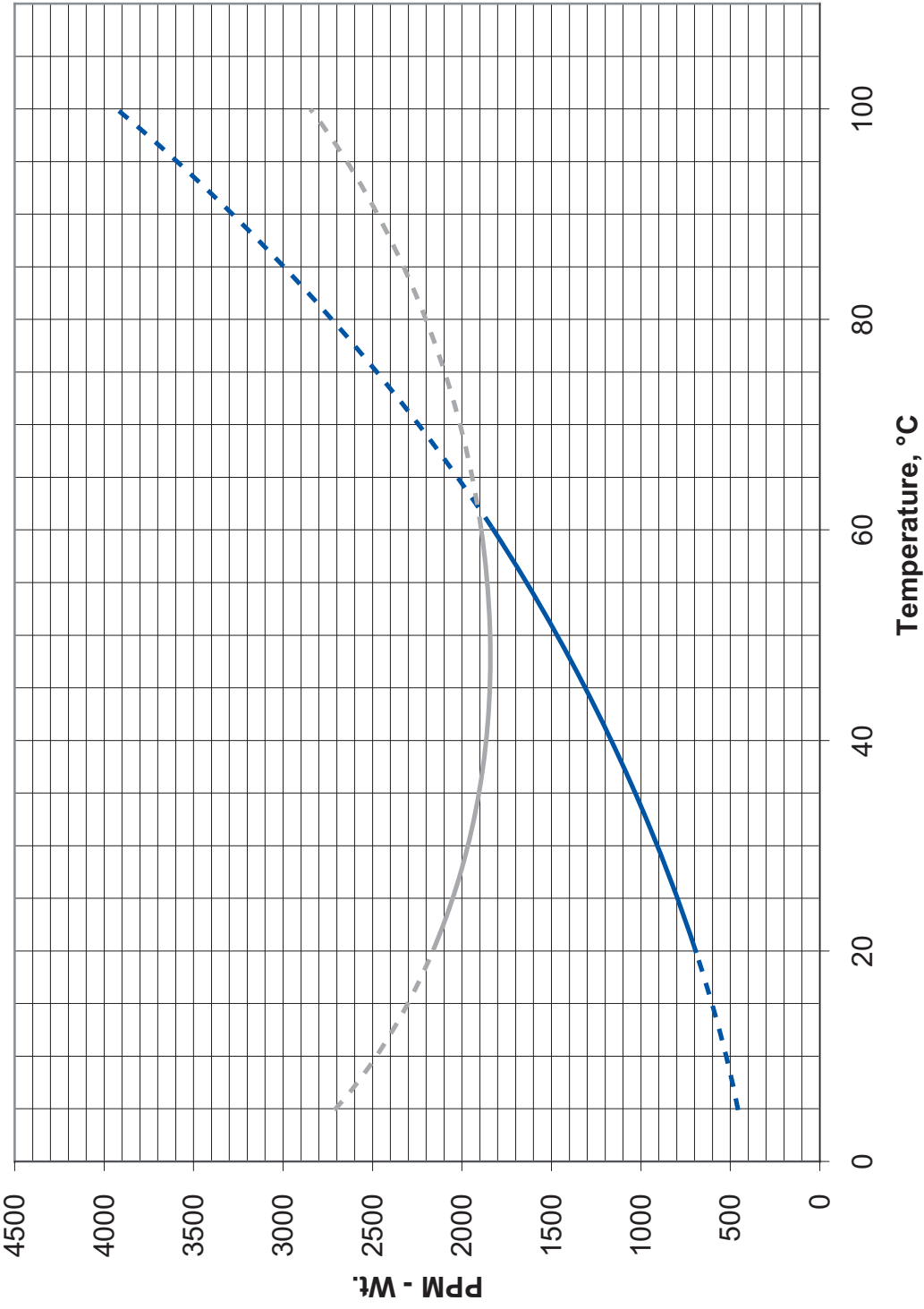
Data are for saturation conditions: the refrigerant-rich phase, water-rich phase and vapor phase are all in equilibrium.

Water in 227ea  
227ea in Water



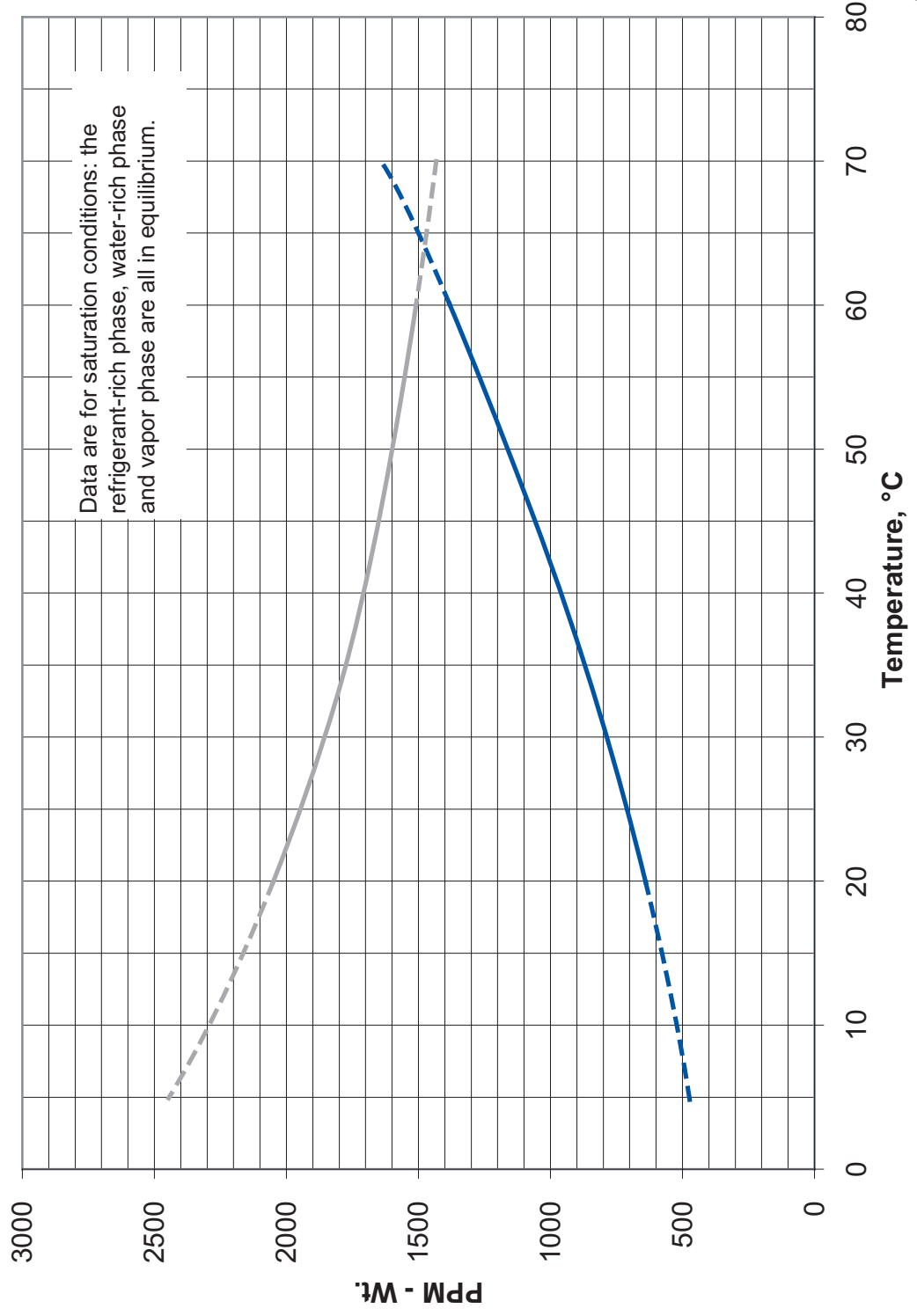
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# Mutual Solubility of HFC-236fa and Water



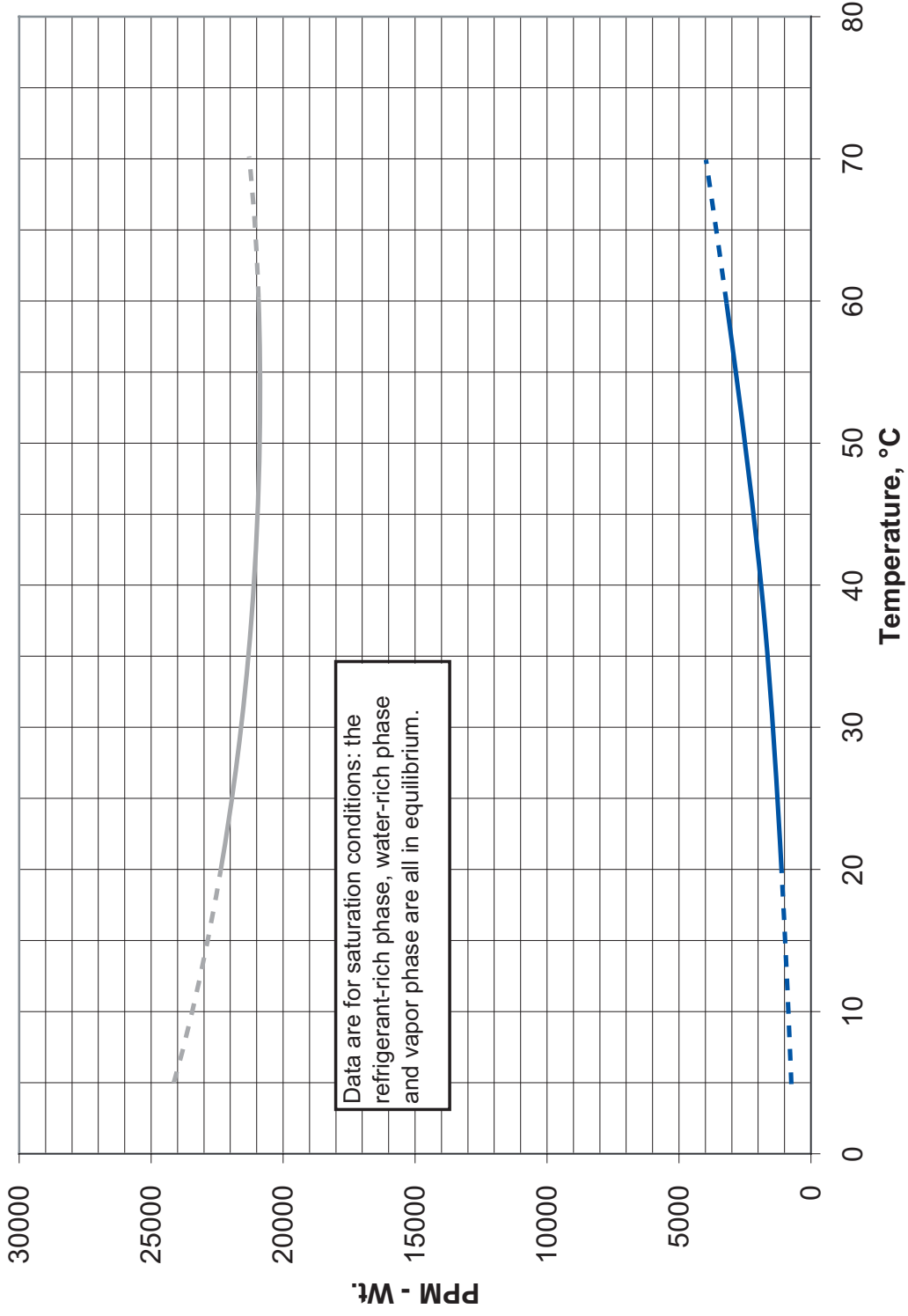
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## Mutual Solubility of DuPont™ Suva® 404A and Water



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# Mutual Solubility of DuPont™ Suva® 407C and Water



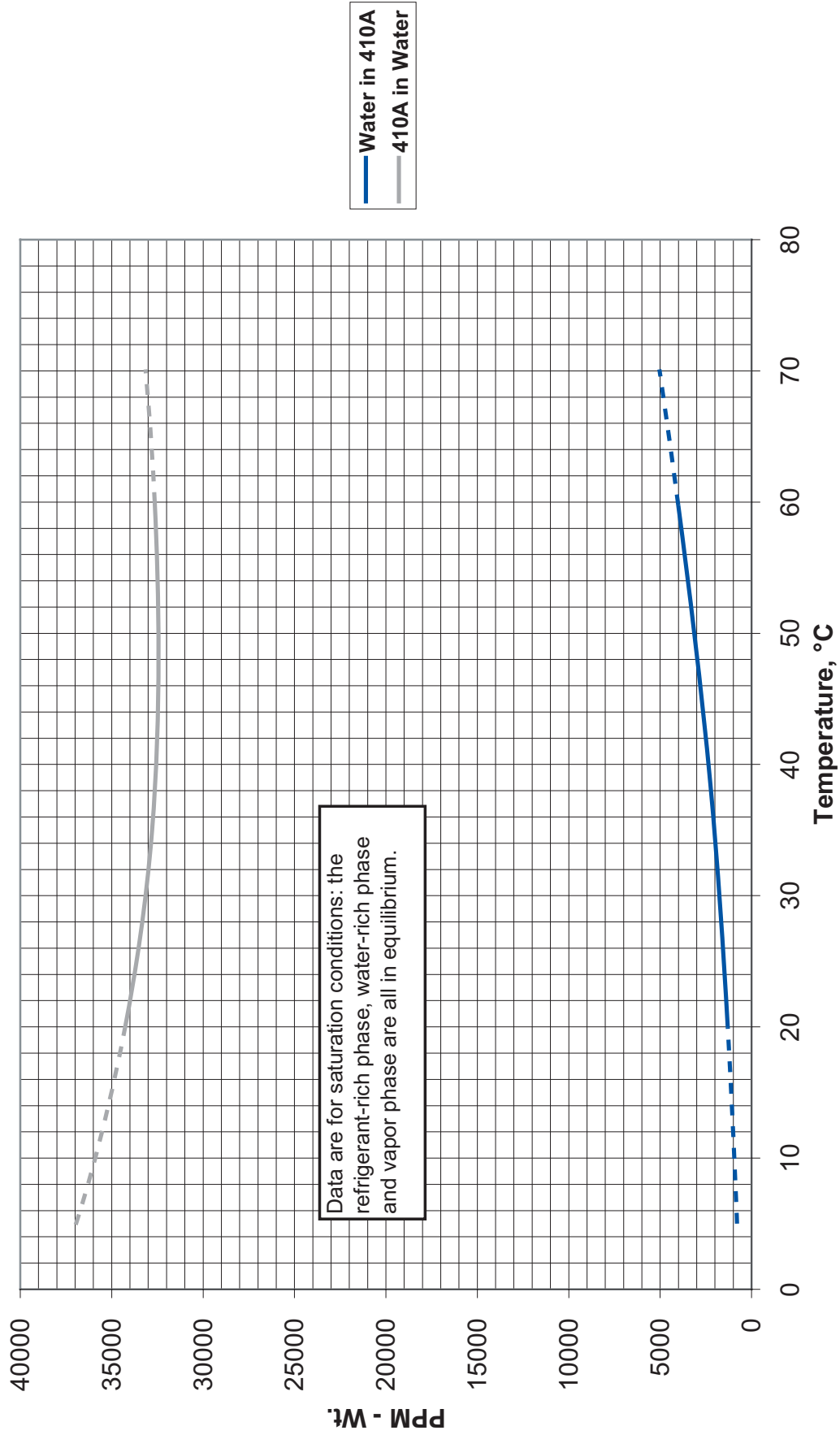
Data are for saturation conditions: the refrigerant-rich phase, water-rich phase and vapor phase are all in equilibrium.

Water in 407C  
407C in Water



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## Mutual Solubility of DuPont™ Suva® 410A and Water



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